42nd Lunar and Planetary Science Conference

March 7–11, 2011
The Woodlands, Texas

Program of Technical Sessions
FORTY-SECOND LUNAR AND PLANETARY SCIENCE CONFERENCE

Program of Technical Sessions

March 7–11, 2011

The Woodlands Waterway Marriott Hotel and Convention Center
The Woodlands, Texas

Sponsored by
Lunar and Planetary Institute
NASA Johnson Space Center

Additional Support Provided by
Northrup Grumman Aerospace Systems

Conference Co-Chairs
Stephen Mackwell, Lunar and Planetary Institute
Eileen Stansbery, NASA Johnson Space Center

Program Committee

Oleg Abramov, Lunar and Planetary Institute
Neyda Abreu, Pennsylvania State University
Mike A’Hearn, University of Maryland
Mary Sue Bell, Jacobs Engineering
Michael Bland, Washington University
Veronica Bray, University of Arizona/Lunar and Planetary Laboratory
Debra Buczkowski, Johns Hopkins University/Applied Physics Laboratory
Emma Bullock, Smithsonian Institution
Cari Corrigan, Smithsonian Institution
Brad De Gregorio, NASA Johnson Space Center
Dave Draper, NASA Johnson Space Center
Denton Ebel, American Museum of Natural History
Justin Filiberto, Rice University
Qi Fu, Lunar and Planetary Institute
Gerald Galgana, Lunar and Planetary Institute
Juliane Gross, Lunar and Planetary Institute
John Gruener, NASA Johnson Space Center
Rose Hayward, U.S. Geological Survey
Jack Holt, University of Texas
Peter Isaacson, Brown University
Katherine Joy, Lunar and Planetary Institute
Jim Lyons, University of California, Los Angeles
Francis McCubbin, University of New Mexico
Pat McGovern, Lunar and Planetary Institute
Lan-Anh Nguyen, Jacobs Engineering
Paul Niles, NASA Johnson Space Center
Andy Rivkin, Johns Hopkins University/Applied Physics Laboratory
Paul Schenk, Lunar and Planetary Institute
Andy Shaner, Lunar and Planetary Institute
Stephanie Shipp, Lunar and Planetary Institute
Justin Simon, NASA Johnson Space Center
Tim Titus, U.S. Geological Survey
David Van Acken, University of Houston
Channon Vischer, Lunar and Planetary Institute
Justin Wilkinson, NASA Johnson Space Center
Axel Wittmann, Lunar and Planetary Institute

Produced by the Lunar and Planetary Institute (LPI), 3600 Bay Area Boulevard, Houston TX 77058-1113. Logistics, administrative, and publications support for the conference were provided by the Meeting and Publication Services Department of the LPI. The LPI is operated by the Universities Space Research Association under a cooperative agreement with the Science Mission Directorate of the National Aeronautics and Space Administration.
ARKANSAS CENTER FOR SPACE AND PLANETARY SCIENCES
FELD 202, Old Museum Building
The University of Arkansas
Fayetteville, AR 72701
Contact: Hazel Sears
479.575.3439
metpub@uark.edu
Meteorite magazine serves as a forum for communication between amateurs, collectors, dealers, meteorite hunters, educators, and researchers interested in meteorites. It publishes articles on meteorites, meteorite recovery, personalities in the meteorite field, and the latest news and discoveries concerning meteorites and their origins. Now in its sixteenth year of publication, the magazine publishes quarterly in February, May, August, and November. See http://meteoritemag.uark.edu/ for more information or contact metpub@uark.edu (business) or meteditr@uark.edu (content).

BOEING COMPANY
7700 Boston Boulevard
Springfield, VA 22153
Contact: Lisa Mercado
703.270.6787
lisa.mercado@hotmail.com
Nearly a century of expertise and continuing innovation make Boeing the leader in the aerospace and defense industry. Boeing combines global resources and a spirit of innovation to provide best-of-industry, network-enabled solutions to military, government, and commercial customers around the world. Boeing also is the world’s largest satellite manufacturer, an emerging leader in support systems and services, and a leading global supplier of human space exploration systems and services.

BRUKER NANO
1239 Parkway Avenue, Suite 203
Ewing, NJ 08628
Contact: Donald Becker
609.771.4473
don.becker@bruker-nano.com
Bruker Nano is the undisputed leader in silicon drift detector (SDD) technology for X-ray microanalysis. The QUANTAX EDS system provides comprehensive microanalysis capability including rapid X-ray spectrum imaging with data mining and AutoPhase analysis as well as integrated feature analysis with high-speed chemical classification. The CrystAlign EBSD system integrates seamlessly with QUANTAX to provide simultaneous crystallographic information. The M4 µXRF system provides fastest data acquisition with excellent spatial resolution due to its advanced capillary optics.

CENTER FOR LUNAR SCIENCE AND EXPLORATION
3600 Bay Area Boulevard
Houston TX 77058-1113
Contact: Julie Tygielski
281.486.2122
tygielski@lpi.usra.edu
The Center for Lunar Science and Exploration is a division of the Lunar and Planetary Institute (LPI) and shares in LPI’s rich heritage dating back to the Apollo missions. The LPI and Johnson Space Center harnessed that heritage to build the Center to better support our nation’s lunar science and exploration activities.

ERNEST H STEGEMAN PUBLISHING
P. O. Box 330
Eureka, CA 95502
Contact: Ernest H Stegeman
707.822.1597
ehstegeman@gmail.com
Self-published independent geologic research. Current research is focused on the Hudson Bay centered astrobleme.
**Isotopx**  
93 Old Farm Road  
Mansfield, MA 02048  
Contact: Laurie Lischer  
508.337.8467  
laurie.lischer@isotopx.com

Isotopx is a manufacturer of state-of-the-art Thermal Ionization Mass Spectrometers, which are used throughout the world for the highest precision and accuracy in isotope ratio measurements on terrestrial as well as extraterrestrial samples. We look forward to meeting customers and friends in Houston.

**Jacobs Technology**  
2224 Bay Area Boulevard  
Houston, TX 77058  
Contact: Sara Robertson  
281.483.5014  
sara.robertson@nasa.gov

Jacobs Technology is the advanced technology division of Jacobs Engineering, one of the nation’s largest engineering and technical services-only companies. With 70+ years of experience supporting government and commercial clients, we have earned a reputation for excellence and outstanding technical and managerial achievements in quality, performance, and safety. Our clients include the DOD, NASA, the U.S. Special Operations Command, the DOE, and dozens of commercial clients, such as Boeing, Lockheed Martin, Rolls-Royce, and General Motors.

**JHU/Applied Physics Laboratory**  
11100 Johns Hopkins Road  
Laurel, MD 20723  
Contact: Margaret Simon  
240.228.7150  
margaret.simon@jhuapl.edu

The Johns Hopkins University’s Applied Physics Laboratory in Laurel, Maryland, makes critical contributions to our nation’s critical challenges by applying academic research to science and technology problems. APL has launched over sixty spacecraft and many more instruments, including New Horizons, MESSENGER, STEREO, and TIMED. Currently, APL is working on the Solar Probe Plus and Radiation Belt Storm Probes.

**JMARS — Mars Space Flight Facility — Arizona State University**  
201 E. Orange Mall  
Tempe, AZ 85287  
Contact: Scott Dickenshied  
520.891.7903  
sdickens@mars.asu.edu

JMARS (Java Mission-planning and Analysis for Remote Sensing) is a Java-based geospatial information system developed by the Mars Space Flight Facility at Arizona State University. It is currently used for mission planning and scientific data analysis by several NASA missions, including Mars Odyssey, Mars Reconnaissance Orbiter, and the Lunar Reconnaissance Orbiter.

**Lockheed Martin Space Systems Company**  
P. O. Box 179, Mail Stop S8110  
Denver, CO 80201  
Contact: Melissa Croswhite  
303.971.9646  
melissa.croswhite@lmco.com

Expanding our knowledge and understanding of the universe is a challenging endeavor that Lockheed Martin has been actively engaged in for nearly five decades. We have developed and deployed numerous spacecraft and products supporting our understanding of Earth and planetary science, heliophysics, and astrophysics. We’re accountable to one standard — 100 percent mission success. We understand the risks and will not shy away from the hard challenges associated with this mission.

**Lunar and Planetary Institute**  
3600 Bay Area Boulevard  
Houston TX 77058-1113  
Contact: Julie Tygielski  
281.486.2122  
tygielski@lpi.usra.edu

The Lunar and Planetary Institute is a nonprofit organization whose focus is on academic participation in studies of the current state, evolution, and formation of the solar system. The Institute is managed by the Universities Space Research Association (USRA). USRA/LPI seeks to foster scientific discovery while inspiring the next generation.

**Lunar and Planetary Institute**  
3600 Bay Area Boulevard  
Houston, TX 77058  
Contact: Mary Ann Hager  
281.486.2136  
mhager@hou.usra.edu

LPI outreach service — Helping you change planetary science entries in Wikipedia.

**NASA In-Space Propulsion Technology Project**  
Mail Stop 77-4  
21000 Brookpark Road  
Cleveland, OH 44135  
Contact: Daniel Vento  
216.433.2834  
daniel.m.vento@nasa.gov

The In-Space Propulsion Technology Project develops advanced propulsion technology for the NASA Science Mission Directorate.
NASA Jet Propulsion Laboratory — Europa Mission/Outer Planets
4800 Oak Grove Drive
Mail Stop 230-260
Pasadena, CA 91109-8001
Contact: Edward Gonzales
818.653.6442 or 818.354.2326
edward.v.gonzales@jpl.nasa.gov

JPL is the NASA center for robotic exploration of the solar system. It is a federally funded research and development center managed by the California Institute of Technology. In addition to its prime mission, JPL conducts Earth-orbiting and astronomy missions and operates NASA's Deep Space Network. Its current projects include the Cassini-Huygens mission to Saturn, the Dawn mission to asteroids Ceres and Vesta, and the Mars Exploration Rovers.

NASA Jet Propulsion Laboratory — Eyes on Earth
4800 Oak Grove Drive
Mail Stop 230-260
Pasadena, CA 91109-8001
Contact: Edward Gonzales
818.653.6442 or 818.354.2326
edward.v.gonzales@jpl.nasa.gov

JPL is the NASA center for robotic exploration of the solar system. It is a federally funded research and development center managed by the California Institute of Technology. In addition to its prime mission, JPL conducts Earth-orbiting and astronomy missions and operates NASA's Deep Space Network. Its current projects include the Cassini-Huygens mission to Saturn, the Dawn mission to asteroids Ceres and Vesta, and the Mars Exploration Rovers.

NASA Jet Propulsion Laboratory — Radioisotope Power Systems
4800 Oak Grove Drive
Mail Stop 230-260
Pasadena, CA 91109-8001
Contact: Edward Gonzales
818.653.6442 or 818.354.2326
edward.v.gonzales@jpl.nasa.gov

JPL is the NASA center for robotic exploration of the solar system. It is a federally funded research and development center managed by the California Institute of Technology. In addition to its prime mission, JPL conducts Earth-orbiting and astronomy missions and operates NASA's Deep Space Network. Its current projects include the Cassini-Huygens mission to Saturn, the Dawn mission to asteroids Ceres and Vesta, and the Mars Exploration Rovers.

NASA Lunar Science Institute
NASA Ames Research Center Building 17, Room 114
Moffett Field, CA 94035
Contact: Ashcon Nejad
650.604.3881
ashcon.nejad@nasa.gov

The NASA Lunar Science Institute (NLSI) is a virtual institute comprised of several competitively selected teams across the U.S., a growing number of international partnerships, and a small central office located at NASA Ames Research Center, Moffett Field, California. The NLSI is funded through the NASA Science Mission Directorate (SMD) with contributions from the NASA Exploration Systems Mission Directorate (ESMD). The NLSI uses collaborative technologies to share scientific results through meetings in virtual space.

NASA Planetary Data System Geosciences Node
Washington University
1 Brookings Drive, Campus Box 1169
St. Louis, MO 63130
Contact: Susan Slavney
314.935.9295
Susan.Slavney@wustl.edu

The Geosciences Node of NASA's Planetary Data System archives and distributes digital data related to the study of the terrestrial planetary bodies. The Node works directly with NASA missions to help them generate well-documented, permanent data archives, and provides the data to the science community via a website where all data may be downloaded free of charge. The Node also provides sophisticated online tools for searching, mapping, and downloading selected data from the archives.

Regional Planetary Information Facility (RPIF) Network
RPIF/Portree
2255 N. Gemini Drive
Flagstaff, AZ 86001
Contact: David Portree
928.556.7037
dportree@usgs.gov

The Regional Planetary Information Facility (RPIF) Network, established by NASA in 1977 to provide researchers with ready access to planetary science image data, has grown to include nine U.S. and eight overseas facilities. Individual RPIFs have unique collections of current and historical planetary science data, including photographs, maps, documents, books, and digital and online materials. These data support research, education, and outreach.
Springer
233 Spring Street, 6th Floor
New York, NY 10013

Contact: Maury Solomon
212.460.1592
maury.solomon@springer.com

Knowledge, information and quality — these are the three things that shape Springer Science+Business Media's business activities. We aim to offer excellence — more than 150 Nobel prize-winners have published with Springer to the present date. Many of our publications are considered authoritative works in their field, read by academics and students, and used by libraries and universities, academic professionals, and practitioners in various branches of industry.

USGS Astrogeology Science Center
United States Geological Survey
2255 N. Gemini Drive
Flagstaff, AZ 86001

Contact: Corey Fortezzo
928.556.7133
cfortezzo@usgs.gov

The USGS Astrogeology Science Center is a community leader in innovative remote sensing techniques, precision cartographic product development, and cutting-edge research. We provide the planetary community with imaging, topographic, and mapping solutions, including ISIS for image processing. Additionally, we provide ISIS, photogrammetry, and GIS support to the planetary community through support pages, tutorials, and workshops. During LPSC, USGS staff will provide support on the topics above and information about the Astrogeology Science Center’s programs.

Wiley-Blackwell
111 River Street
Hoboken, NJ 07030

Contact: Traci Carney
515.292.0140 x617
tcarney@wiley.com

Wiley-Blackwell is the international scientific, technical, medical, and scholarly publishing business of John Wiley & Sons, with strengths in every major academic and professional field and partnerships with many of the world's leading societies. Wiley-Blackwell publishes over 1400 peer-reviewed journals as well as 1500+ new books annually in print and online, as well as databases, major reference works, and laboratory protocols. For more information, please visit www.wiley.com or www.onlinelibrary.wiley.com.
Guide to Technical Sessions and Activities

Sunday Evening, March 6, 4:00 p.m.
Waterway Ballroom  Registration
Prefunction Area

Sunday Evening, March 6, 5:00 p.m.
Waterway Ballroom  Reception
Prefunction Area

Monday Morning, March 7, 8:30 a.m.
Waterway Ballroom 1  SPECIAL SESSION: Cryospheres I: Icy Insights into Mars Paleoclimate  p. 1
Waterway Ballroom 4  Cosmochemical Origins I: Photochemistry, Transport, and Disk Evolution  p. 3
Waterway Ballroom 5  Small Bodies: A Traverse from NEOs to TNOs  p. 5
Waterway Ballroom 6  SPECIAL SESSION: Planetary Magmatic Volatiles  p. 6

Monday Afternoon, March 7, 1:30 p.m.
Waterway Ballroom 4  PLENARY SESSION: Masursky Lecture and Dwornik Award Presentations  p. 8

Monday Afternoon, March 7, 2:30 p.m.
Waterway Ballroom 1  Mercury  p. 9
Waterway Ballroom 4  Achondrites  p. 10
Waterway Ballroom 5  Asteroid Geophysics and Processes: Surfaces and Interiors  p. 12
Waterway Ballroom 6  Formation and Evolution of the Moon I: From Giant Impact to Differentiation  p. 13

Monday Evening, March 7, 5:30 p.m.
Waterway Ballroom 4  Planetary Decadal Survey Briefing

immediately followed by
Montgomery Ballroom  Student/Scientist Reception

Tuesday Morning, March 8, 8:30 a.m.
Waterway Ballroom 1  SPECIAL SESSION: Cryospheres II: Martian Ground Ice and Associated Landforms  p. 15

followed at 10:15 a.m. by
Waterway Ballroom 4  SPECIAL SESSION: Cryospheres III: Active Ice Processes  p. 16
Waterway Ballroom 4  Unraveling the Origins of Presolar Grains  p. 17
Waterway Ballroom 5  Terrestrial Impact Craters  p. 19
Waterway Ballroom 6  Formation and Evolution of the Moon II: Lunar Magma Ocean Crystallization and Primary Crust Production  p. 20
Tuesday Afternoon, March 8, 1:30 p.m.

Waterway Ballroom 1 Carbon on Mars: Surface to Atmosphere and Implications for Exobiology p. 22
Waterway Ballroom 4 Cosmochemical Origins II: Isotopic Constraints on Early Solar System Chronology p. 24
Waterway Ballroom 5 Impacts: Modeling and Remote Sensing p. 26
Waterway Ballroom 6 Formation and Evolution of the Moon III: Secondary Crust Production p. 28
Montgomery Ballroom Education and Public Outreach: Applying What We Know to Teacher Professional Development and Citizen Science p. 29

Tuesday Evening, March 8, 6:00 p.m.

Town Center Exhibit Area Poster Session I
- Presolar Grains p. 32
- Cosmochemical Origins I: Photochemistry, Transport, and Disk Evolution p. 33
- Cosmochemical Origins II: Isotopic Constraints on Early Solar System Chronology p. 36
- Early Solar System II: Chondrules and Amoeboid Olivine Aggregates p. 39
- Achondrites p. 42
- Iron Meteorites and Pallasites p. 43
- Education and Public Outreach: Meteorites p. 45
- Asteroid Disruption: Artificial and Natural p. 45
- Asteroid Studies: From the Lab to the Main Belt p. 46
- Asteroid Photogeology p. 48
- Asteroid Discovery and Exploration p. 48
- Mercury p. 49
- Thermal and Magmatic Evolution of the Moon p. 50
- Composition and Structure of the Lunar Crust: Samples p. 54
- Composition and Structure of the Lunar Crust: Remote Sensing p. 56
- Samples and Spectroscopy: Insights into the Lunar Crust p. 58
- Moon: Apollo-Lunokhod Legacy p. 59
- Education and Public Outreach: Moon p. 61
- Impacts I: Modeling and Experiments p. 61
- Impacts II: Terrestrial Craters p. 64
- Materials Analogs: Living in a Material World p. 70
- Mars Rovers and Landers p. 71
- Mars: Large Volcanos and Lava Flows p. 73
- Martian Layered Deposits p. 74
- Mars: Terrestrial Analogs p. 74
Tuesday Evening, March 8, 6:00 p.m. (continued)

Town Center Exhibit Area

Poster Session I (continued)

Cryosphere:  *Icy Insights into Mars Paleoclimate*  
 p. 75

Martian Ground Ice:  *Theory, Modeling, Observations, and Terrestrial Analog*  
 p. 77

Seasonal Ice Processes  
 p. 79

Icy Surface-Atmosphere Interaction  
 p. 80

Titan Everything  
 p. 82

Atmospheres:  *Observations and Processes*  
 p. 83

Venus  
 p. 84

Planetary Mission Concepts  
 p. 86

Environmental Analog:  *Not Exactly Club Med*  
 p. 90

Data Tools, Access, and Archiving  
 p. 96

Education and Public Outreach:  *Community Engagement*  
 p. 97

Education and Public Outreach:  *Scientist Engagement in Education and Public Outreach*  
 p. 97

Education and Public Outreach:  *Undergraduate Education*  
 p. 98

Education and Public Outreach:  *Training the Next Generation of Scientists and Engineers*  
 p. 98

Education and Public Outreach:  *High School Research/Competition*  
 p. 99

Education and Public Outreach:  *K–12 Resources*  
 p. 99

Wednesday Morning, March 9, 8:30 a.m.

Waterway Ballroom 1 Mars Sediment Revelations:  *Genesis, Chronicles, and Landing Site Lamin(t)ations*  
 p. 100

 p. 101

Waterway Ballroom 5 SPECIAL SESSION:  *Comet Hartley 2 and Related Bodies, In Situ and Remote I*  
 p. 103

Waterway Ballroom 6 Composition and Structure of the Lunar Crust from Samples and Spectroscopy  
 p. 105

Montgomery Ballroom Impact Experiments  
 p. 107
Wednesday Afternoon, March 9, 1:30 p.m.

Waterway Ballroom 1  Mars Alteration: Phyllosilicates, Sulfates, and Soils  p. 109
Waterway Ballroom 4  Early Solar System Reservoirs and Processes II: Chondrules and Amoeboid Olivine Aggregates  p. 110
Waterway Ballroom 5  SPECIAL SESSION: Comet Hartley 2 and Related Bodies, In Situ and Remote II  p. 112
Waterway Ballroom 6  Mare Basalts from Source to Eruption  p. 114
Montgomery Ballroom  Venus: Atmosphere, Surface, and Interior  p. 116

followed at 3:30 p.m. by

Shocked Mineral Grains: Recorders of Impacts  p. 117

Wednesday Evening, March 9, 5:30 p.m.

Waterway Ballroom 4  NASA Headquarters Briefing

Thursday Morning, March 10, 8:30 a.m.

Waterway Ballroom 1  Exobiology I: Habitability of Mars  p. 119

followed at 10:30 p.m. by

Waterway Ballroom 1  Exobiology II: Biomarkers, Building Blocks, and Bacteria  p. 120
Waterway Ballroom 4  SPECIAL SESSION: Results from Hayabusa!  p. 121
Waterway Ballroom 5  Planetary Dynamics and Tectonics  p. 123
Waterway Ballroom 6  Planetary Differentiation: Cores and Mantles  p. 125

Thursday Afternoon, March 10, 1:30 p.m.

Waterway Ballroom 1  Brines, Gullies, and the Cryosphere  p. 126

followed at 3:15 p.m. by

Waterway Ballroom 1  Acid vs. Alkaline: The Noachian-Hesperian Transition on Mars  p. 127
Waterway Ballroom 4  Dusty Horizons: Interplanetary, Interstellar, and Cometary Particles  p. 128
Waterway Ballroom 5  Primitive Meteorites I: Diversity  p. 131
Waterway Ballroom 6  Lunar Surface and Volatiles: Interaction with the Space Environment  p. 132
Montgomery Ballroom  Mini-Mimas and Those Battered Saturnian Satellites  p. 134

Thursday Evening, March 10, 6:00 p.m.

Town Center Exhibit Area  Poster Session II

Giant Planets, Rings, and Other Things  p. 137
Icy Surfaces and Interiors  p. 138
Volcanism in the Outer Solar System  p. 140
Small Bodies: Outer Solar System and Meteors  p. 141
A Pre-Dawn Perspective — Vesta and the HEDs  p. 142
Thursday Evening, March 10, 6:00 p.m. (continued)

Town Center Exhibit Area  Poster Session II (continued)

Dusty Horizons I: Interplanetary Dust Particles and Micrometeorites  p. 145
Dusty Horizons II: Stardust  p. 146
Primitive Meteorites I: Diversity  p. 148
Primitive Meteorites II: Carbonaceous Chondrites and New Minerals  p. 151
Organics and Volatiles in Chondritic Meteorites and the Solar Wind  p. 153
SNC Meteorites: Igneous and Alteration Processes  p. 155
Mars Alteration: Carbonates, Sulfates, Chlorides, and Phyllosilicates  p. 157
Igneous Geochemistry of the Martian Surface  p. 160
Crusty Mars and the Antarctic: Brines, Clathrates, Hydrates, Salts, Gullies, and Methane  p. 161
Field and Laboratory Analogs for Martian Alteration  p. 163
Martian Fanclub  p. 165
Mars Fluvial Processes and Hydrology  p. 165
Mars Aeolian Processes: Dust, Devils, Dunes, and Analogs  p. 167
The Medusae Fossae Formation  p. 169
Martian Pits and Caves  p. 170
Martian Impact Crater Statistics and Their Implications  p. 171
Geology of Martian Impact Craters and Basins  p. 172
Impact Processes on Mars: Geology, Mineralogy, and Alteration  p. 173
Mars Data Analysis, Processing, and Global Mapping  p. 174
Exobiology  p. 175
Igneous Processes: Lavas, Volcanos, and Geochemistry  p. 178
Planetary Differentiation  p. 181
Planetary Dynamics and Tectonics  p. 181
Lunar Impacts: Timing, Morphology, and Tectonics  p. 185
Moon: Datasets, Catalogs, and Archives  p. 189
The Moon as an Airless Body  p. 191
The Dust Bin: Lunar Soil and Regolith Processes  p. 194
Moon: Remote Sensing Nuts and Bolts  p. 196
Moon: Missions and Samples  p. 198
Mars Instruments: Methods and Calibrations for the Mars Science Laboratory and the Mars Reconnaissance Orbiter  p. 199
**Friday Morning, March 11, 8:30 a.m.**

Waterway Ballroom 1  Mars Aeolian Processes: Suspension, Saltation, and Bedform Migration  p. 211

followed at 10:15 a.m. by

Waterway Ballroom 4  Mars Geomorphology: Fluvial  p. 211


Waterway Ballroom 5  Vesta and HED Meteorites: The Pre-Dawn Perspective  p. 214


**Friday Afternoon, March 11, 1:30 p.m.**

Waterway Ballroom 1  From Mantle to Crust: Martian Petrology and Geochemistry  p. 218

Waterway Ballroom 4  Primitive Meteorites II: Thermal and Aqueous Alteration, Shock, and Awe  p. 220

Waterway Ballroom 5  Coldmember: Icy Ocean Worlds  p. 221

Waterway Ballroom 6  Lunar Impacts II: Basins, Craters, and Impact Melts  p. 223

**Print-Only Presentations**

- Interplanetary and Presolar Dust  p. 225
- Cosmochemical Origins: Photochemistry, Transport, and Disk Evolution  p. 225
- Cosmochemistry, Disk Processes, and Meteorites  p. 226
- Small Bodies  p. 227
- Differentiated Meteorites  p. 228
- Planetary Dynamics and Tectonics  p. 228
- Mercury  p. 229
- Moon  p. 229
- Impacts  p. 231
- Igneous Processes  p. 232
- Mars  p. 232
- Exobiology  p. 234
- Planetary Atmospheres  p. 234
- Outer Solar System Satellites and Rings  p. 235
- Missions, Instruments, and Payload Concepts  p. 235
- Data Tools, Access, and Archiving  p. 236
- Education and Public Outreach  p. 236
SPECIAL SESSION:
CRYOSPHERES I: ICY INSIGHTS INTO MARS PALEOCLIMATE
Monday, 8:30 a.m. Waterway Ballroom 1

Chairs: Patrick Russell and John Holt

Mars in the Current Glacial-Interglacial Cycle: Exploring an Anomalous Period in Mars Climate History [#1315]
The extensive geological record of Mars’ most recent ice age and the current interglacial period offer unprecedented and accessible opportunities to explore and characterize systematic effects of individual periods of spin-axis/orbital variation.

8:45 a.m. Feldman W. C. * Prettyman T. H. Maurice S. Lawrence D. J. Pathare A. Milliken R. E. Travis B. J.
Search for Remnant Water Ice from Past Glacial Climates on Mars: The Mars Odyssey Neutron Spectrometer [#2420]
We find at least three likely target locations of presently existing deposits of buried “bulk” water ice that may be remnants of multiple episodes of dirty ice precipitation events at low to mid-martian latitudes driven by climate changes during the last 1 to 10 Ma.

9:00 a.m. Schaefer E. I. * Head J. W. Kadish S. J.
Vaduz, an Unusual Fresh Impact Crater on Mars: Evidence for Impact into a Recent Ice-Rich Mantle [#1199]
We document a very fresh midlatitude impact crater, Vaduz, whose associated deposits provide insight into the nature, distribution, and timing of ice-rich mantles as well as the impact-related mechanisms for armoring these mantles.

9:15 a.m. Rutledge A. M. * Christensen P. R.
Hypsometric Analysis of Glacial Features in the East Hellas Basin Region, Mars: Implications for Past Climate Shifts [#2124]
We apply hypsometric analysis to lobate debris aprons in eastern Hellas, Mars to complete a detailed areal inventory of the buried ice deposits. The resulting curves vary with latitude and elevation, indicating a potential past climate signal.

9:30 a.m. Souness C. J. * Hubbard B. Quincey D. J. Milliken R.
Geographical Controls on the Distribution of Glacier-Like Forms in Mars’ Mid-Latitudes: Observations from a Survey of Mars Reconnaissance Orbiter Context Camera Data [#1021]
This research finds that glacier-like forms (GLFs) on Mars formed simply through viscous creep of a pre-existing ice mass in response to local topography and not under the influence of a glacial mass-balance regime such as operates on Earth.

9:45 a.m. Kargel J. S. * Furfaro R. Wibben D. Berman D. C. Hubbard B. Milliken R. E. Pelletier J. Rodriguez J. A. P.
Melting a Martian Viscous Flow Feature: A Modern-Climate, Dust-Blanketed Glacier Model [#2266]
Evidence points to glacial flow and melting of a landform in a crater east of Hellas, Mars. A thick blanket of insulating dust might allow melting under the present climate, thus offering an alternative to a modified, warmer recent climate.
10:00 a.m. Fastook J. L. * Head J. W. III Marchant D. R. Forget F. Madeleine J.-B. 
*A Warmer Atmosphere on Mars Near the Noachian-Hesperian Boundary: Evidence from Basal Melting of the South Polar Ice Cap (Dorsa Argentea Formation) [#1212]*
Dorsa Argentea Formation (Noachian-Hesperian) eskers are evidence for basal melting. Ice-flow models show that the mean annual south polar temperature must be raised to –50° to –75°C, providing an independent estimate of elevated lower latitude surface temperature.

*Creep of Water Ice Plus Magnesium Perchlorate Hydrate [#1909]*
Motivated by a Mars NPLD morphology that suggests a material of weaker rheology than ice, we deformed a polycrystalline sample of solid ice + magnesium perchlorate. The material is profoundly weaker than pure water ice at Mars polar cap temperatures.

10:30 a.m. Winebrenner D. P. * Stillman D. E. Grimm R. E. 
*Detectability by Radar of Salts in Martian Ice Deposits [#2532]*
Salt in martian ice could have significant implications for ice-rheology near and above eutectic temperatures. Using laboratory data and dielectric modeling, we investigate detection of salts, including perchlorate salts, using radar attenuation.

We find that SHARAD reveals complex internal stratigraphy within Planum Boreum, Mars, that can only be explained as resulting from deposition and erosional processes. There is no evidence in the stratigraphy for significant ice flow.

11:00 a.m. Smith I. B. * Holt J. W. 
*Temporal and Spatial Evolution of Spiral Troughs on Planum Boreum, Mars from Detailed Stratigraphic Mapping: Implications for Local Atmospheric Processes [#2742]*
Continued mapping of troughs demonstrates local variations in migration indicating local processes compete in magnitude with both regional and cap-wide events.

11:15 a.m. Plaut J. J. * 
*Stratigraphy of the Upper Martian North Polar Layered Deposits from Radar, Visible and Topographic Data [#2653]*
Data from the SHAllow RADar sounder (SHARAD) are compared to visible images and topographic data, including stereo-derived DEMs, to tie the positions of radar reflectors to outcrops of layered deposits visible in high-resolution images.

11:30 a.m. Conway S. J. * Hovius N. Barnie T. D. Besserer J. Le Mouélic S. Reed N. 
*The Origin and Evolution of Ice Domes in the North Polar Region of Mars [#2030]*
We have characterized the geological setting, morphology, stratigraphy and composition of 18 ice-domes inside craters between 70° and 85°N. We find that most of them were formed by atmospheric deposition separate from the polar cap.
Observational Signatures of Carbon Isotope Ice-Gas Fractionation Towards Solar-Type Protostars [#1281]

We find a direct correlation in [12CO]/[13CO] gas and the CO ice fraction toward several YSOs, suggesting that 12CO-13CO ice-gas fractionation may affect protostellar carbon isotopic evolution, and help explain the peculiar solar system [12C]/[13C].

Carbon Isotope Fractionation Between CO Gas and CO Ice with Implications for 12C/13C of the Interstellar Medium and the Early Solar System [#1323]

A model for carbon-isotope fractionation between CO ice and gas is presented. The model includes a self-consistent portrayal of the kinetics of partitioning of 12C and 13C between CO ice and gas. Ice-gas carbon exchange may be a primary control for 12C/13C.

Anomalous Isotope Effect in VUV Photodissociation of Hydrogen Sulfide: Implications for Chondrite and Chondrule Isotopic Data [#1569]

Mass-independent sulfur-isotopic compositions have been observed during H2S photolysis with VUV photons from the ALS synchrotron. The role of VUV photolysis of H2S will be discussed to explain the anomalous sulfur-isotopic composition found in chondrites.

Testing “Self-Shielding” Model with Laboratory Experiment for the Oxygen Isotope Evolution in the Early Solar Nebula — A Progress Report [#2705]

We report our first results for CO self-shielding experiment using high resolution VUV laser and molecular beam technique at very low temperature. Slope 1 line is obtained for 105.17 nm band, thought to be responsible for ~60% of CO self-shielding for the oxygen isotopes.

Modeling CO Photolysis Experiments and Disk Chemistry Using Line-by-Line Spectra for the Oxygen Isotopologues of CO [#2780]

Full line-by-line spectra are used to simulate CO photolysis experiments and solar nebula chemistry. For the disk, a temperature-dependence of the `slope’ is predicted which may be useful in ruling out some self-shielding models.

Concurrent Births of the Organic Matter and the Oxygen Isotope Anomaly in the Solar Nebula [#1153]

The coherent enrichments of 17,18O and 13C detected among organic grains extracted from an Antarctic CR2 chondrite suggest that the non-mass-dependent O-isotope fractionation occurred in a warm environment such as the envelope of the solar nebula.
**10:00 a.m.**  Brownlee D. E. * Joswiak D. Matrajt G.  
*Large Coarse-Grained Solid Particles in Comets — A Ubiquitously Distributed Component in the Solar Nebula?* [#2235]
The large solid particles in comet Wild 2 may represent a large particle component that was distributed to all early bodies in the solar nebula. This hypothesis is tested by comparing large solid particles from a variety of cometary sources.

**10:15 a.m.**  Ciesla F. J. *  
*Particle Residence Times in Solar Nebula Environments: Chemical Evolution Due to Radial Motions in an Evolving Disk* [#1101]
We develop a Monte Carlo model to calculate particle paths in an evolving solar nebula and to quantify the time spent in different environments. The model is used to understand the nebular processing experienced by meteoritic components.

**10:30 a.m.**  Jacquet E. * Gounelle M. Fromang S.  
*Transport and Preservation of Calcium-Aluminum-Rich Inclusions: The Role of the Dead Zone* [#1091]
We show that preservation of CAIs until chondrite accretion is achieved in the dead zone of the disk. We also propose initial transport of CAIs via expansion of a compact disk.

**10:45 a.m.**  Perry J. D. * Gostomski E. Matthews L. S. Hyde T. W.  
*The Influence of Monomer Shape on Aggregate Morphologies in First Stage Protoplanetary Development* [#2019]
Studies modeling the coagulation of dust particles typically assume spherical monomers. While this assumption simplifies the problem it may not always be valid. This study compares morphology of aggregates built from spheres and ellipsoids.

**11:00 a.m.**  Davison T. M. * Collins G. S. Ciesla F. J. O’Brien D. P.  
*The Energy Budget of Planetesimal Collisions: A Quantitative Analysis* [#2530]
Monte Carlo simulations have been used to determine the total energy available from impacts on planetesimal parent bodies. We will present a quantitative comparison of the available heat from collisions and the decay of short-lived radionuclides.

**11:15 a.m.**  Boss A. P. *  
*Planet Formation Processes in a Marginally Gravitationally Unstable Disk Around a Solar-Mass Protostar* [#2205]
Marginally gravitationally unstable disks provide a natural mechanism for the rapid transport radially inward and outward of short-lived radioactivities and refractory grains, but they might also form giant planets by disk instability.

**11:30 a.m.**  Minton D. A. * Levison H. F.  
*Why is Mars Small? A New Terrestrial Planet Formation Model Including Planetesimal-Driven Migration* [#2577]
The small size of Mars is a persistent problem for planet-formation models. We present new simulations for Mars formation that include the effect of planetesimal-driven migration, a critical mechanism that has been left out of previous studies.
11:45 a.m.  Walsh K. J. *   Morbidelli A.   Raymond S. N.   O’Brien D. P.   Mandell A. M.
*The Asteroid Belt and Mars’ Small Mass Explained by Large-Scale Gas-Driven Migration of Jupiter [#2585]
We present a scenario to reproduce Mars’ small mass, as well as the S/C dichotomy of the asteroid belt, by taking into account the inward-then-outward gas-driven migration of Jupiter that is predicted by hydrodynamical simulations.

SMALL BODIES: A TRAVERSE FROM NEOs TO TNOs
Monday, 8:30 a.m.  Waterway Ballroom 5

Chairs:  Amy Mainzer and Andrew Rivkin

*NEOWISE — An Infrared View of the Solar System [#1121]
The Wide-field Infrared Survey Explorer (WISE) has imaged the entire sky from 3 to 22 μm. Additions to the baseline pipeline (known as “NEOWISE”) have resulted in the detection of >155,000 minor planets, including >500 NEOs and 120 comets.

8:45 a.m.  Michel P. *   Delbo M.
*Past Thermal and Orbital Histories of 1999JU3 and 1999RQ36: Two Potential Targets of Sample Return Space Missions to a Primitive Asteroid [#1234]
Computations of thermal evolutions of two targets of sample return space missions to a primitive asteroid, namely 1999JU3 and 1999RQ36, indicate that if organic material is present in their subsurface at depths of 3–5 cm, it should be protected from thermal break-up.

*WISE Results for the Main Belt Asteroids [#1304]
We present diameter and albedo results for main belt asteroids using data from the WISE spacecraft. We focus on the distribution of albedo as a function of position within the belt.

*Opening the Mid-IR Window on Asteroid Physical Properties [#1344]
By conducting new laboratory experiments, we seek to reveal and model asteroid physical properties (such as composition and effective mean particle size) that may be uniquely revealed in the mid-infrared.

9:30 a.m.  Vilas F. *   Hendrix A. R.
*The Short Wavelength End of the Space Weathering of S-Complex Asteroids [#2264]
Ground-based UV/VIS reflectance spectra and photometry of S-complex asteroids, including members of newly-discovered very young asteroid families, are used to test hypothesis that the UV/blue spectral region is a more sensitive indicator of space weathering than the VNIR.

9:45 a.m.  Reddy V. *   Gaffey M. J.   Carvano J. M.   Lazzaro D.   Mothé-Diniz T.
*Mineralogical Characterization of Baptistina Asteroid Family [#2106]
Baptistina asteroid family has been proposed as the source region of the K-T impactor. Our study of the family shows that it is not the K-T impactor source.
10:00 a.m. Granahan J. C. *
Spectral Observations of a Non-Chondritic 951 Gaspra [#1002]
An updated analysis of NASA Galileo spacecraft observations indicate that 951 Gaspra has been
subjected to igneous processes. This is derived from an observed relative abundance of olivine that is
higher than measured in ordinary chondrites.

10:15 a.m. Rivkin A. S. * Clark B. E. Ockert-Bell M. E. Shepard M. K. Volquardsen E. L.
Howell E. S. Bus S. J.
Observations of 21 Lutetia in the 2–4 μm Region with the NASA IRTF [#1439]
Lutetia’s surface / Rosetta looked at its north / We looked to the south.

10:30 a.m. Burbine T. H. * Duffard R. Buchanan P. C. Cloutis E. A. Binzel R. P.
Spectroscopy of O-Type Asteroids [#2483]
O-type asteroids 3628 Božňáčková and 7472 Kumakiri have absorption bands similar to pyroxenes but
with band minima that are not typically found for terrestrial pyroxenes and known pyroxene-dominated
meteorite assemblages.

10:45 a.m. O’Dea E. R. * Hardersen P. S.
Searching for Igneous Asteroids in the Outer Main Belt [#2479]
Near-infrared reflectance spectroscopy of two outer main-belt asteroids was performed in order to
continue to constrain the abundance of igneous asteroids in the outer main belt.

11:00 a.m. Beck P. * Quirico E. Sevestre D. Montes-Hernandez G. Pommerol A. Schmitt B.
Ice vs. Goethite as the Origin of the 3 Micron Feature on Low Albedo Asteroids [#2047]
We measured the reflectance spectra of synthetic goethite and compared it with asteroid observations.

Outer Main Belt Asteroids: Identification and Distribution of Four Spectral Groups [#1182]
VNIR spectra of outer main belt asteroids have revealed an interesting trend spanning the 2.5 < a <
4.6 AU region. Four spectral groups were identified: the Ceres-like group, the sharp OH group, the
rounded H2O group, and the featureless group.

11:30 a.m. Cook J. C. * Desch S. J. Rubin M.
The Black Sheep of Haumea’s Collisional Family [#2503]
We predict that the impact that produced Haumea’s collisional family likely ejected undifferentiated
(rock/ice mix) crustal fragments that spectrally resembled other KBOs. We suggest candidates for these
non-icy members of the collisional family.

SPECIAL SESSION: PLANETARY MAGMATIC VOLATILES
Monday, 8:30 a.m. Waterway Ballroom 6

Chairs: James Greenwood and Hanna Nekvasil

8:30 a.m. Jones R. H. * McCubbin F. M. Guan Y.
Phosphate Mineralogy and the Role of Fluids in the Zag H Chondrite [#2435]
In Zag, apatite is Cl-rich and has very low H2O abundances. We propose that Zag records interactions
between metamorphosed chondrite material and a dry, halogen-rich fluid that may have originated from
degassing a partially molten interior.
8:45 a.m. Becker H. *   Fischer-Gödde M.
Highly Siderophile Element Abundances in Lunar Impact Rocks and Implications for the Volatile Budget of the Silicate Earth [#1786]
The highly volatile element budget of the silicate Earth will be discussed in the context of late accretion and recent data of highly siderophile elements in ancient lunar impact rocks and the terrestrial mantle.

9:00 a.m. Filiberto J. *   Treiman A. H.   Dasgupta R.
Comparing the Effects of H2O, F, and Cl on Near-Liquidus Phase Equilibria of a Model High-Fe Basalt: Implications for Volatile Induced Mantle Melting [#2064]
We compare experimental results of a high-Fe basalt composition with fluorine, and chlorine added independently to the effect of water on olivine liquidus depression of basalts.

9:15 a.m. Ardia P. *   Withers A. C.   Hirschmann M. M.
Methane Solubility Under Reduced Conditions in a Haplobasaltic Liquid [#1659]
We document small but significant solubility of methane in magmatic liquids. These solubilities are smaller than some recent experimental measurements, but sufficient such that methane is likely the dominant dissolved carbon-bearing species in reduced magmas.

9:30 a.m. Zhang Y. *
“Water” in Lunar Basalts: The Role of Molecular Hydrogen (H2), Especially in the Diffusion of the H Component [#1957]
The highly reduced condition in lunar basalts means that molecular H2 is likely a significant species of the H component, in addition to OH and molecular H2O. Hence, H2 diffusion almost certainly plays a major role in transporting the H component.

9:45 a.m. Hirschmann M. M. *
A Magma Ocean Carbon Pump? [#2321]
Dense CO2 early atmospheres may be limited if a carbon pump operates, transporting C from the surface and precipitating it in reduced phase in planetary interiors. Whether this occurs depends on the solubility of CO2 and CH4 as a function of fO2 and pressure.

10:00 a.m. Weber A. *   Saal A. E.   Hauri E. H.   Rutherford M. J.   Van Orman J.
The Volatile Content and D/H Ratios of the Lunar Picritic Glasses [#2571]
We present volatile contents (C, H2O, F, S, Cl) and δD lunar volcanic glasses. Our results suggest the presence of water in the Moon interior with a δD similar to that of the terrestrial mantle.

10:15 a.m. Greenwood J. P. *   Itoh S.   Sakamoto N.   Warren P. H.   Dyar M. D.   Yurimoto H.
Origin of Lunar Water and Evidence for a Wet Moon from D/H and Water in Lunar Apatites [#2753]
We present new results on the D/H and water content of lunar apatites in support of a wet Moon and an elevated D/H.

10:30 a.m. McCubbin F. M. *   Shearer C. K.   Sharp Z. D.
Magmatic Volatiles in Lunar Apatite: Approaching a Single Solution to Many Unique Observations [#2341]
Recent analyses of volatiles from lunar minerals have resulted in seemingly incompatible conclusions regarding the volatile content of the Moon. We attempt to reconcile these differences, placing the data in the context of the lunar magma ocean hypothesis.

10:45 a.m. Shearer C. K. *   Burger P. V.   Guan Y.   Papike J. J.   Sutton S. R.
Using a variety of approaches, we examine the process of volatile element transport in the lunar crust.
11:00 a.m. Barrat J. A. * Yamaguchi A. Bunch T. E. Bohn M. Bollinger C. Ceuleneer G.
Fluid-Rock Interactions Recorded in Unequilibrated Eucrites [#1306]
Some unequilibrated eucrites display olivine veinlets and secondary anorthite that require the involvement of a late metasomatic agent. Aqueous fluids are plausible candidates for explaining the deposits of the secondary phases inside the cracks.

11:15 a.m. Nakamura N. * Nyquist L. E. Reese Y. Shih C-Y. Fujitani T. Okano O.
Stable Chlorine Isotopes and Elemental Chlorine by Thermal Ionization, Mass Spectrometry, and Ion Chromatography; Martian Meteorites, Carbonaceous Chondrites and Standard Rocks [#2513]
Results of stable Cl isotope and elemental analyses by TIMS combined with HF-leaching/ion chromatography for martian meteorites, carbonaceous chondrites, and standard rocks are presented.

11:30 a.m. Sharp Z. D. * Shearer C. K. Jr. Agee C. B. McKeegan K. D.
The Chlorine Isotope Composition of Mars [#2534]
The chlorine-isotope value of martian meteorites average –0.5‰, indistinguishable from bulk Earth and carbonaceous chondrites. Apatite analyses are variable, from –3.2 to +1.4‰ and correlate with Cl content.

PLENARY SESSION: MASURSKY LECTURE AND DWORNIK AWARD PRESENTATIONS
Monday, 1:30 p.m. Waterway Ballroom 4

Chairs: Stephen Mackwell and Eileen Stansbery

Presentation of the 2010 GSA Stephen E. Dwornik U.S. Citizen Student Award Winners

Best Graduate Oral Presentation:
Erin Shea, Massachusetts Institute of Technology, “Evidence for a Lunar Core Dynamo at 3.7 Ga from Mare Basalt 10020?”

Best Undergraduate Oral Presentation:
Jacob Richardson, Eastern Michigan University, “Identification of Volcanic Ridge in Northern Syria Planum, Mars: Constraint on Geologic History of Syria”

Best Graduate Poster Presentation:

Best Undergraduate Poster Presentation:
Cameron Mercer, Middlebury College, “Principal Components Analysis of Reflectance Spectra Returned by the Mars Exploration Rover Opportunity”

Presentation of the 2011 LPI Career Development Award Winners

Humberto Carvajal-Ortiz, Indiana University
Jonathan Craig, University of Arkansas
Joshua Garber, University of California, Davis
Maria Gritsevich, Moscow State University
Samantha Kate Harrison, The Open University
Matthew Huber, Universität Wien
Richard Kraus, Harvard University
Eriita Jones, The Australian National University
Arianne Mader, University of Western Ontario
Collen Milbury, University of California, Los Angeles
Ian O. McGlynn, University of Tennessee
MESSENGER's three Mercury flybys revealed a planet with a rich geological history and strong interactions among the solar wind, magnetosphere, exosphere, and surface. MESSENGER’s year-long orbital operations are scheduled to commence this month.

The primary crater population on Mercury has been modified by volcanism and secondary craters.

The Caloris Basin on Mercury is floored by light-toned plains and surrounded by an annulus of dark-toned material interpreted to be ejecta blocks and smooth, dark, ridged plains. We outline the tasks associated with a new mapping project of these intra-ejecta dark plains.

MESSENGER/MASCS obtained spectra of Mercury, not yet photometrically corrected. We applied PCA, clustering, and a linear decomposition algorithm, aided by reflectance spectra from DLR/PEL in a MASCS-matching geometry, then shocked to a temperature >500°C.

Measurements made by the MESSENGER gamma-ray spectrometer during the Mercury flybys were used to calculate the surface K, Th, and U abundances. Comparisons to compositional models illustrate the ability of gamma-ray spectroscopy to contribute to geochemical analysis.
3:45 p.m. Stockstill-Cahill K. R. * McCoy T. J. Domingue D. L. Lawrence D. J. Nittler L. R. Peplowski P. N. 
Low-FeO Silicates and Abundant Fe,Mg,Ti-Oxides: Indications from MELTS Modeling for a Complex Igneous History for Mercury [#2339]
Equilibrium and fractional crystallization MELTS models of potential parental magmas for the surface of Mercury were run. Results suggest that no single-stage melting of a chondritic precursor could have produced the surface of Mercury.

4:00 p.m. Fei Y. * Hillgren V. J. Shahar A. Solomon S. C. 
On the Silicon Content of Mercury’s Core and Implications for Core Mineralogy, Structure, and Density [#1949]
We use experimental Si partitioning data to explore a range of possible Si contents in Mercury’s core. For a given Si content, we predict core structure. We further evaluate core size and moment of inertia from the computed density profiles.

4:15 p.m. Lucey P. G. * Riner M. A. 
The Optical Effects of Small Iron Particles that Darken but do not Redden: Evidence of Intense Space Weathering on Mercury [#1333]
An improved radiative transfer model of space weathering is applied to Mercury that indicates that nanophase iron is more abundant on Mercury than on the Moon, consistent with a space weathering rate higher than lunar.

4:30 p.m. Siegler M. A. * Bills B. G. Paige D. A. 
Long Term Climate Variability of Mercury’s Poles [#1882]
The MESSENGER mission will provide an unprecedented look into the polar regions and their near subsurface. In anticipation, we examine long term orbital variations experienced by Mercury and the effects they might have on ice distribution.

ACHONDrites
Monday, 2:30 p.m. Waterway Ballroom 4

Chairs: Julia Cartwright and Paul Warren

Volatile-Rich Asteroid Differentiation and Links Between Felsic Meteorites Graves Nunataks 06128 and 06129, Brachinites and ‘Brachinite-Like’ Achondrites [#1456]
We explore possible relations between recently discovered felsic achondrite meteorites with olivine-dominated “brachinites” as differentiation products of volatile-rich parent bodies.

Highly-Siderophile-Element and Osmium Isotope Constraints on the Evolution of Angrites [#2288]
Re-Os systematics of quenched- and slowly-cooled angrites suggests that Re behaved as an incompatible and compatible element during the genesis of each of these magma-groups. This difference potentially relates to variations in oxidation state.
3:00 p.m. Amelin Y. * Iizuka T. Huyskens M.  
Mineral Chemistry of Angrite NWA 4590, and Its Potential Use for Inter-Calibration of Isotopic Chronometers [#2542]
LA-ICPMS analysis of trace elements in olivine, plagioclase, Fe-rich and Mg-rich pyroxene, ulvöspinel, merrillite, and silico-apatite from angrite NWA 4590 shows how these minerals can be used for short-lived and long-lived isotope chronometry.

3:15 p.m. Goodrich C. A. * Wilson L.  
Oxygen Isotope and Siderophile Element Tests of Ureilite Petrogenesis Models [#1246]
Oxygen isotope and siderophile element characteristics of ureilites are difficult to reconcile with any petrogenetic model. We examine (1) homogeneous equilibrium smelting, (2) heterogeneous equilibrium smelting, (3) disequilibrium smelting, and (4) nonsmelting models.

3:30 p.m. Kita N. T. * Goodrich C. A. Zolensky M. E. Herrin J. S. Shaddad M. H. Jenniskens P.  
Oxygen Isotope Systematics of Almahata Sitta [#1491]
We report high-precision SIMS oxygen-isotope analyses of six fragments of the Almahata Sitta polymict ureilite. A correlation between oxygen isotopes and Mg# indicates that the meteorite carries the source materials common to known ureilites.

Petrography and Geochemistry of Metals in Almahata Sitta Ureilites [#2720]
We present geochemical and petrographic data, including highly siderophile elements and EBSD mapping, for metal in seven ureilitic samples of Almahata Sitta. We find some samples are unique when compared with datasets for other ureilites.

4:00 p.m. Hartmann W. K. Goodrich C. A. O’Brien D. P. * Michel P. Weidenschilling S. J. Sykes M. V.  
Breakup and Reassembly of the Ureilite Parent Body, Formation of 2008 TC3/Almahata Sitta, and Delivery of Ureilites to Earth [#1360]
2008 TC3/Almahata Sitta provides clues not only to ureilite history but also to the dynamics and evolution of the asteroid belt, impact fragmentation, and delivery of meteorites to Earth. We discuss scenarios for its formation using petrologic and dynamical constraints.

4:15 p.m. Warren P. H. *  
Ureilites as the Moderate-SiO2 Residue of Basaltic Melt Removal from a Diverse Aggregate of SiO2-Rich Chondritic Parent Materials [#2769]
Mass-balance modeling for average ureilite as an anatexis residue indicates the ureilite starting materials had far higher SiO2/FeO ratio in comparison to any known type of carbonaceous chondrite.

4:30 p.m. Welten K. C. * Meier M. M. M. Caffee M. W. Nishiizumi K. Wieler R. Jenniskens P. Shaddad M. H.  
Cosmogenic Nuclides and Noble Gas Evidence that Almahata Sitta Chondrites Represent Fragments of Asteroid 2008 TC3 [#2667]
We present evidence that two ordinary chondrites from the Almahata Sitta strewnfield were part of asteroid 2008 TC3 and may have been incorporated into the ureilitic host during a catastrophic collision ~3.8 Ga ago.
Chairs: James Roberts and Benjamin Weiss

2:30 p.m.  Richardson J. E. *  
*Regolith Generation, Retention, and Movement on Asteroid Surfaces: Early Modeling Results [#1084]*
A three-dimensional model of cratered surface evolution is used to investigate the development of regolith layers on initially rocky, S-type asteroid bodies as a function of time and accumulated impacts.

2:45 p.m.  Murdoch N.  Michel P. *  Richardson D. C.  Walsh K. J.  Losert W.  Berardi C.  Green S. F.  
*Numerical Simulations of Granular Dynamics in Various Conditions Applicable to Regolith Motion on Small Body Surfaces [#1113]*
Understanding regolith motion in various conditions can help interpreting images of asteroid surfaces and designing efficient sampling mechanisms. We first simulated numerically shaking, avalanche processes and tumbler behaviors, with comparisons with laboratory experiments.

3:00 p.m.  Noble S. K. *  Hiroi T.  Keller L. P.  Rahman Z.  Sasaki S.  Pieters C. M.  
*Experimental Space Weathering of Ordinary Chondrites by Nanopulse Laser: TEM Results [#1382]*
Scanning and transmission electron microscope analysis of a suite of artificially space weathered ordinary chondrites with different metallic iron contents (H, L and LL) reveals the creation of similar nanophase iron-bearing melt and vapor deposits.

3:15 p.m.  Weiss B. P. *  Elkins-Tanton L. T.  Barucci M. A.  Sierks H.  Pätzhold M.  Snodgrass C.  Marchi S.  
Richter I.  Weissman P. R.  Fulchignoni M.  Binzel R. P.  
*Evidence for Thermal Metamorphism or Partial Differentiation of Asteroid 21 Lutetia from Rosetta [#2077]*
Observations of asteroid 21 Lutetia by the Rosetta spacecraft indicate that its surface resembles some chondrites, yet its density is like that of the differentiated asteroid 4 Vesta. This suggests that Lutetia may be partially differentiated.

3:30 p.m.  Wakita S. *  Jogo K.  Krot A. N.  
*Thermal Evolution of CV-Like Carbonaceous Chondrite Asteroid [#1221]*
We report numerical simulations of thermal evolution of a CV-like parent body using different initial conditions. We found that the CV parent body that accreted at 1.4–1.8 Ma after formation of CAIs could reach peak metamorphic temperature of 1100 K.

3:45 p.m.  Scheeres D. J. *  Sánchez P.  
*Evolution of Small, Rapidly Rotating Asteroids [#2307]*
Small rubble-pile asteroids can be spun rapidly due to cohesive van der Waals forces. When they split they must be rotationally accelerated to split again, a process that can eventually completely fission the body. Applications to 2008 TC3 are made.

4:00 p.m.  Jacobson S. J. *  Scheeres D. J.  
*Long-Term Stable Equilibria for Synchronous Binary Asteroids [#2239]*
We present theoretical evidence for the existence of a long-term stable equilibrium solution for small, synchronous binary asteroids, which enables direct study of asteroid geophysics through tidal theory and the BYORP effect.
4:15 p.m. Roberts J. H. * Rivkin A. S. Chabot N. L.

_A Transient Dynamo on Vesta? [2242]_

A core dynamo on 4 Vesta is impossible now. At best a hot core would yield a transient field early on. We test a hypothesis that an impact restarts the dynamo. In fact, the projectile we need to accomplish the deed won’t leave Vesta intact.

4:30 p.m. Castillo-Rogez J. C. * Choukroun M. Hodyss R. P. Johnson P. V. Rivkin A. S. Raymond C. A.

_Origin of Ceres’ Surface as a Product of Mobile-Lid Convection [2486]_

We demonstrate that all conditions were met for mobile-lid convection to take place in Ceres in the past, and that its peculiar surface is evidence for the occurrence of that mechanism.

---

**FORMATION AND EVOLUTION OF THE MOON I:
FROM GIANT IMPACT TO DIFFERENTIATION**

*Monday, 2:30 p.m. Waterway Ballroom 6*

**Chairs:** Renee Weber and Willem van Westrenen

2:30 p.m. Reufer A. * Meier M. M. M. Benz W. Wieler R.

_Obtaining Higher Target Material Proportions in the Giant Impact by Changing Impact Parameters and Impactor Composition [1136]_

In the current giant impact scenario, the Moon is composed mainly from impactor material. This contradicts heavily the isotopic signature of the Moon. We show alternate models with considerably higher amounts of target material in the Moon.

2:45 p.m. Williams J. G. Boggs D. H. Ratcliff J. T. *

_Lunar Moment of Inertia and Love Number [2610]_

New data improves lunar science results. A fluid core and tidal dissipation are inferred from dissipation effects on orientation. Detection of core-mantle boundary flattening is also fluid core evidence. A new Love number and solid moment are given.

3:00 p.m. Ward Wm. R. *

_Vertical Structure of a Two-Phase Pre-Lunar Disk [1319]_

The post-impact evolution of a two-phase pre-lunar disk is examined assuming that the vertical temperature profile is regulated by the vapor-melt phase transition and that the spreading rate of the disk is radiation limited.

3:15 p.m. Zhang J. * Dauphas N. Davis A. M.

_Titanium Isotope Homogeneity in the Earth-Moon System: Evidence for Complete Isotope Mixing Between the Impactor and the Protoearth [1515]_

High-precision Ti-isotope studies show that the Moon has the same $\varepsilon^{56}\text{Ti}$ as the Earth within ~0.1 $\varepsilon$-units. These results provide solid evidence showing that the isotopic compositions of Earth and the Moon were well mixed, irrespective of elemental volatility.

3:30 p.m. Desch S. J. * Taylor G. J.

_A Model of the Moon’s Volatile Depletion [2005]_

We present a preliminary model of the protolunar disk and quantify the depletion of volatiles due to hydrodynamic escape of the disk’s atmosphere. Depletion of water from a terrestrial value ~500 ppm, to a value <10 ppm, is predicted.

---

*42nd LPSC Program, Monday Oral Sessions 13*
3:45 p.m. Weber R. C. * Lin P. Garnero E. J. Williams Q. Lognonne P.  
*Seismic Evidence for the Lunar Core [#1903]*  
In this work, we present a re-analysis of the Apollo lunar seismic data to search for evidence of layering in the deepest Moon, and find evidence of a solid inner and fluid outer core, overlain by a partial melt boundary layer.

4:00 p.m. Dwyer C. A. * Nimmo F. Stevenson D. J.  
*Driving an Early Lunar Dynamo via Mechanical Stirring [#2044]*  
We find, using an energetics approach, that differential motion across the lunar core-mantle boundary could have stirred a liquid (outer) core sufficiently to generate a dynamo at ancient times.

4:15 p.m. Le Bars M. * Cébron D. Wieczorek M. Karatekin O. Laneuville M.  
*An Impact Driven Dynamo for the Early Moon [#2291]*  
We propose an alternative mechanism for generating a dynamo in the early Moon, supplied by tidal instability in its core once unlocked from synchronization by large impacts. Surface field of several microT are obtained for several 10000 years.

4:30 p.m. Day J. M. D. * Walker R. J.  
*The Highly Siderophile Element Composition of the Lunar Mantle [#1288]*  
Available HSE data indicates the lunar mantle has <20× lower abundances of these elements than the terrestrial mantle. We review the distribution of these elements in mantle source regions and constraints placed on lunar evolution.
SPECIAL SESSION:  
CRYOSPHERES II: MARTIAN GROUND ICE AND ASSOCIATED LANDFORMS  
Tuesday, 8:30 a.m.  Waterway Ballroom 1

Chairs:  
Timothy Titus and Stephen Clifford

8:30 a.m.  
Clifford S. M. *  Lasue J.  Le Gall A.  Heggy E.  
The Response of Martian Ground Ice to Burial by a Volatile-Poor Mantle:  Potential Implications for the Volatile Evolution of the Medusae Fossae Formation [#2142]  
We consider the thermal and volatile response of an ice-rich martian crust to burial by an initially dry porous mantle of sediment or volcanic ash.

8:45 a.m.  
Geophysical Mars Analog Studies of Multiphase Water in the Great Kobuk Sand Dunes, Northwestern Alaska [#2501]  
Late-winter GPR and CCR geophysical surveys of high-latitude, slowly migrating sand dunes were highly effective at mapping geology and the hydrocryosphere. Such instruments should be regularly included in rover payloads.

9:00 a.m.  
Soare R. J. *  Costard F.  Pearce G.  
Possible Pingos and Crater-Floor Landscapes in Northwest Utopia Planitia:  A Re-Assessed Hypothesis Based on HiRISE Imagery [#1364]  
Here we use HiRISE imagery to reevaluate a periglacial hypothesis, first proposed in 2005 by us on the basis of MOC imagery, analogically linking crater-floor mounds in northwest Utopia Planitia to pingo-thermokarst lake complexes on Earth.

9:15 a.m.  
Haltigin T. W. *  Pollard W. H.  Dutilleul P.  
Statistical Evidence of Polygonal Terrain Self-Organization on Earth and Mars [#1622]  
This research presents a new technique to study the evolution of polygonal terrain networks. Results from a variety of sites in the Canadian High Arctic and on Mars demonstrate that these networks become statistically more regular as they develop.

9:30 a.m.  
Séjourné A. *  Costard F.  Fedorov A.  Gargani J.  Soare R. J.  Marmo C.  
Thermokarst Degradation of Potential Ice-Wedge Polygons Inside Scalloped Depressions in Utopia Planitia, Mars [#1904]  
Scalloped depressions formed by degradation of ground-ice dot the region of Utopia Planitia. Inside these depressions, polygons are successively degraded by sublimation forming semicircular hollows. The polygons could be underlain by ice-wedges.

9:45 a.m.  
Dundas C. M. *  Byrne S.  McEwen A. S.  
Modeling Development of Martian Sublimation Thermokarst Landforms [#2527]  
We model landscape evolution, driven by sublimation, of disturbances over the martian ice table, producing landforms similar to martian scalloped depressions.
Ice Lens Formation and Frost Heave at the Phoenix Landing Site [2543]

A numerical model of frost heave and ice lens initiation, employing pre-melting physics, demonstrates that ice lenses are capable of initiating at the Phoenix landing site, even within the past few tens of thousands of years.

SPECIAL SESSION: CRYOSPHERES III: ACTIVE ICE PROCESSES
Tuesday, 10:15 a.m. Waterway Ballroom 1

Chairs: Timothy Titus and Stephen Clifford

10:15 a.m. Calvin W. M. * James P. B. Cantor B. A.
Interannual and Seasonal Variability in the North Polar Region of Mars: Observations in Mars Years 29 and 30 by MARCI, CTX and CRISM [2401]
We summarize the interannual and summer variability in the bright ice deposits in the martian north polar layered deposits using MARCI, CRISM, and CTX over the course of the MRO mission.

10:30 a.m. Byrne S. *
Simulating the Landscape Evolution of the Martian Residual CO2 Ice Cap [2728]
I model the observed landscape evolution of the martian ice ca, where expanding pits were interpreted as evidence of climate change. Model results show no such change is necessary and predict an ice cap continuously being destroyed and recreated.

10:45 a.m. Becerra P. * Byrne S. HiRISE Team
Modeling the Formation of CO2 Frost Halos on the South Polar Residual Cap of Mars [2252]
We introduce a model for the formation of bright halos seen by HiRISE on the edges of scarps and “swiss cheese” features in the south polar residual cap of Mars. We propose that they are formed from differences between the sublimation rates of sloped and flat surfaces.

11:00 a.m. Aye K.-M. * Pommerol A. Portyankina G. Thomas N. Hansen C. J.
Martian South Polar Terrains in Spring: I. Multi-Instrumental Observations [2320]
Data from several instruments have been used to identify evolutionary stages in the seasonal development of large-scale surface brightness and small features’ shapes, sizes, and numbers in the martian south polar terrains.

11:15 a.m. Portyankina G. * Thomas N. Pommerol A. Aye K-M. Hansen C. J. Herkenhoff K.
Martian South Polar Terrains in Spring: II. Modelling of Relevant Physical Processes [1709]
In this work we summarize our attempts to model various physical processes that shape the surface of southern polar terrains during local spring and are commonly accepted to be related to the sublimation of seasonal CO2 cap.
Active Jets and Slab Ice in the Seasonal South Polar Cap of Mars [1942]

Unexpectedly, geomorphological analysis of 5000 images show that CO₂ jets are active outside the martian cryptic region, some without apparent spiders. Additional spectral studies will be presented to test the necessity of translucent slab ice.

UNRAVELING THE ORIGINS OF PRESOLAR GRAINS

Tuesday, 8:30 a.m.   Waterway Ballroom 4

Chairs: Larry Nittler and Ernst Zinner

8:30 a.m. Zinner E. * Jadhav M. Gyngard F. Nittler L. R.
Bonanza, a Huge Presolar SiC Grain of Type X [1070]
Bonanza is a 30 µm large presolar SiC grain of Type X. This large size allows isotopic analysis of many elements. We report Al-Mg, Ca, Ti, Fe and Ni isotopic measurements.

8:45 a.m. Hoppe P. * Fujiya W.
Titanium-44 and Light Sulfur in Presolar Silicon Carbide Grains with Heavy Silicon: Proof of a Supernova Origin [1059]
We report here on C, Mg-Al, Si, S, and Ca-Ti isotope measurements on presolar SiC grains with heavy Si. Heavy Si together with light S and large excesses in ⁴⁴Ca, resulting from in situ decay of ⁴⁴Ti, are a proof for a SN origin of these grains.

9:00 a.m. Meyer B. S. * Bojazi M. J.
Production of Nitrogen-15 in Explosive Helium Burning and Supernova Presolar Grains [2376]
Production of nitrogen-15 in explosive helium burning occurs by sequences of alpha and neutron capture reactions. Shocks stronger than in current supernova models increase the rates for these reactions and may help explain the N isotopes in presolar-grain SiC-X grains.

9:15 a.m. Croat T. K. * Jadhav M. Lebsack E. Bernatowicz T. J.
A Unique Supernova Graphite: Contemporaneous Condensation of All Things Carbonaceous [1533]
We report a supernova graphite that contains internal subgrains of TiC, SiC, Fe and Ni silicides, and iron metal. These phases comprise a complete list of the phases predicted by equilibrium calculations to condense from C-rich supernova zones.

9:30 a.m. Stroud R. M. * Chisholm M. F. Heck P. R. Alexander C. M. O’D.
Discovery of Glassy Carbon in Meteoritic Nanodiamond Residues: Implications for Nanodiamond Origins [1940]
Aberration corrected electron microscopy shows that Allende and Murchison nanodiamond residues contain glassy carbon in addition to diamond. The glassy carbon is a potential carrier of isotope anomalies indicative of supernova nucleosynthesis.

Atom-Probe Tomographic Characterization of Meteoritic Nanodiamonds and Presolar SiC [1595]
We have carried out atom-probe tomography on individual presolar nanodiamonds and a presolar SiC. Al in the SiC shows a banded structure and may be segregated along planar defects, possibly in solid solution as AlN. Additional data will be presented.
10:00 a.m. Zega T. J. * Nittler L. R. Stroud R. M. Alexander C. M. O’D. Kilcoyne A. L. D. 
*Ti-XANES of Solar and Presolar Hibonite [#1465]*

We report Ti-XANES measurements on solar and presolar hibonite grains. The data suggest that the redox conditions under which a presolar supernova grain condensed may have been more reducing than that of the solar grain and a presolar AGB grain.

10:15 a.m. Nittler L. R. * Gyngard F. Zinner E. Stroud R. M. 
*Mg and Ca Isotopic Anomalies in Presolar Oxides: Large Anomalies in a Group 3 Hibonite Grain [#1872]*

Large Mg and Ca isotopic anomalies in a Group 3 presolar hibonite grain are difficult to explain by models of supernovae or low-metallicity AGB stars, proposed sources of such grains. A highly $^{18}$O-rich grain points to selective mixing in supernovae.

10:30 a.m. Nguyen A. N. * Messenger S. Ito M. Rahman Z. 
*Fe and Mg Isotopic Analyses of Isotopically Unusual Presolar Silicate Grains [#2711]*

Fe and Mg isotopes are measured in presolar silicates having unusual O isotopic compositions to help identify the grains’ stellar sources and the source of Fe. These grains were first isolated by FIB milling to reduce contaminating signal.

10:45 a.m. Gyngard F. * Nittler L. R. Zinner E. Jose J. Cristallo S. 
*New Reaction Rates and Implications for Nova Nucleosynthesis and Presolar Grains [#2675]*

We report the discovery of four new O-rich presolar nova candidate grains and compare their compositions to stellar models calculated with updated nuclear reaction rates.

11:00 a.m. Pepin R. O. * Palma R. L. Gehrz R. D. Starrfield S. 
*Presolar Grains from Novae: Evidence from Helium and Neon Isotopes in Interplanetary Dust Particles (IDPs) from Comet Dust Stream Collections [#1477]*

Particles from stratospheric collectors flown to sample comet dust streams carry noble gas signatures pointing to origin in nova explosions.

11:15 a.m. Hynes K. M. * Amari S. Bernatowicz T. J. Lebsack E. Gyngard F. Nittler L. R. 
*Combined TEM and NanoSIMS Analysis of Subgrains in a SiC AB Grain [#2332]*

We report the results of NanoSIMS and TEM analysis, including isotopic, structural, chemical, and subgrain data, on a SiC AB grain. This grain contains the first oldhamite subgrains observed in a presolar grain, as well as TiC- and Fe-rich subgrains.

*Morphology of Presolar Corundum Grains from Unequilibrated Ordinary Chondrites [#2599]*

Detailed observations of morphology and crystallography of nine presolar corundum grains (seven Group I and two Group III grains) showed that presolar corundum grains commonly have a fluffy and fine-structured shape.
Chairs: David Kring and Keith Milam

8:30 a.m.
Mohr-Westheide T. Reimold W. U. * Thirlwall M.
*Genesis of Pseudotachylitic Breccia from the Vredefort Dome, South Africa: Current State of Research [#1146]*
Field, petrographic, and chemical evidence pertaining to the genesis of pseudotachylitic breccia in large impact structures is reviewed and the still-debated formation of such breccias is evaluated.

8:45 a.m.
Singleton A. C. * Osinski G. R. Grieve R. A. F. Shaver C.
*Characterization of Impact Melt-Bearing Impactite Dykes from the Central Uplift of the Mistastin Lake Impact Structure, Labrador [#2250]*
This study investigates the characteristics of impact melt-bearing breccias and impact melt rocks which occur as intrusive bodies in the central uplift of the Mistastin Lake impact structure.

9:00 a.m.
Wright S. P. * Newsom H. E.
*Analyses of a Large Sample Collection of Shocked Deccan Basalt Reveal a Range of Shock Pressures, Protoliths, and Pre- and Post-Impact Alteration Products [#1619]*
A large, ~80 kg sample collection of shocked basalt does not grow on trees. The foresighted will appreciate the various research projects and implications described here.

9:15 a.m.
Sharpton V. L. *
*Haughton Impact Structure: Re-Evaluation and Reassessment of its History and Current State [#2822]*
Recent hypotheses regarding the nature and state of the Haughton impact structure are evaluated.

9:30 a.m.
*The Oasis Structure, Southeastern Libya — New Constraints on Size, Age and Mechanism of Formation [#1024]*
New results from the up to 36-km-wide, eroded, Oasis structure confirm shock deformation and a complex fold-and-fault interference pattern in sedimentary strata consistent with centripetal slumping and radial constriction.

9:45 a.m.
Ferrière L. * Osinski G. R.
*The New Luizi Impact Structure (Democratic Republic of Congo) and Implications for Central Peak and Peak Ring Formation [#1642]*
Our findings at the Luizi structure provide insights into the formation of mid-sized impact craters in sedimentary target lithologies — structural ring structures within the central uplift may form by collapse of an unstable central peak.

10:00 a.m.
Higgins M. D. * Lajeunesse P. St-Onge G. Locat J. Duchesne M. Ortiz J. Sanfaçon R.
*Bathymetric and Petrological Evidence for a Young (Pleistocene?) 4-km Diameter Impact Crater in the Gulf of Saint Lawrence, Canada [#1504]*
The Corossol Crater is a complex crater ~4 km in diameter with a central uplift, a prominent moat, and multiple, low-relief ridges. The minimum age is ~13 ka. The impact origin is confirmed by a sample of suevite.

10:15 a.m.
Öhman T. * Preeden U.
*Shock Metamorphism of Quartz in Saarijärvi and Söderfjärden Impact Structures, Finland [#1546]*
Samples from Saarijärvi and Söderfjärden structures reveal multiple sets of PFs, PDFs, and feather feature lamellae in orientations typical for shock metamorphism, establishing their impact origin. Saarijärvi is most likely Early Cambrian or younger.
Fold Hinge in Overturned Coconino Sandstone and its Structural Displacement During the Formation of Barringer Meteorite Crater (a.k.a Meteor Crater) [#1740]  
New details are uncovered about the overturning and emplacement of impact ejecta at the classic impact site: Meteor Crater.

10:45 a.m.  Raschke U. *  Reimold W. U.  Schmitt R. T.  
Preliminary Stratigraphy and First Petrographic and Geochemical Results from the ICDP Drill Core from El’gygytgyn Crater (Russia) [#1299]  
The first lithological description and geochemical analysis of the 2009 drilled (ICDP-Project) impact rocks of the El’gygytgyn-crater in northeast Siberia. It is one of the best-preserved impact craters in silicious rocks.

11:00 a.m.  Pittarello L.  Koeberl C.  El’gygytgyn Scientific Party  
Geometrical Characterization of Quartz Clasts in Impact Melt Breccia from the El’gygytgyn Drill Core [#1697]  
Image analysis applied to quartz clasts in samples from the El’gygytgyn drill core, e.g., shape, preferred orientation, and abundance, may provide a basis for differentiating various types of impact melt breccia.

11:15 a.m.  Huber M. S. *  Crne A. E.  Lepland A.  Melezhik V. A.  Koeberl C.  FAR DEEP Science Team  
Possible Occurrence of Distal Impact Ejecta from the Vredefort Impact Event in Drill Cores from the Onega Basin, Russia [#1487]  
Round-ovoid, millimeter-scale features are described from drill cores from the Onega Basin, Russia, in a stratigraphic unit with age constraints including the Vredefort impact event.

11:30 a.m.  Davatzes A. E. *  
Impact Plume Fractionation as Indicated by Size and Mineral Diversity in Archean Spherules [#1751]  
The size distribution and relative abundance of the five major types of spherules in the S3 section of the Barberton greenstone belt, South Africa are analyzed and quantified.

---

**FORMATION AND EVOLUTION OF THE MOON II:**  
**LUNAR MAGMA OCEAN CRYSTALLIZATION AND PRIMARY CRUST PRODUCTION**  
**Tuesday, 8:30 a.m.  Waterway Ballroom 6**

**Chairs:**  Linda Elkins-Tanton and Juliane Gross

8:30 a.m.  Elkins-Tanton L. T. *  Burgess S.  Yin Q.-Z.  
The Lunar Magma Ocean:  Reconciling the Solidification Process with Lunar Petrology and Geochronology [#1505]  
Detailed physical and chemical models of fractional solidification of the lunar magma ocean offer solutions to both basalt and picritic glass source region compositions and depths, and to the wide span of ages of highlands materials.

8:45 a.m.  de Vries J. *  van den Berg A. P.  van Westrenen W.  
Numerical Convection Modelling of a Compositionally Stratified Lunar Mantle [#1745]  
Using numerical convection models of a stratified lunar mantle we show that initial layering strongly influences the mantle dynamics. At the meeting results will be shown of the inclusion of composition dependent heat production in these models.
9:00 a.m. Namiki N. *
Lunar Internal Structure Estimated from Local Admittance between Gravity and Topography [#1277]
The admittance curves between localized gravity disturbance and topography of lunar basins support
classification of the Type I, II, and primary mascon basins.

9:15 a.m. Garrick-Bethell I. * Nimmo F. Wieczorek M. A.
Structure and Formation of the Lunar Farside Highlands: Implications for
Global Crustal Evolution [#2714]
The shape of the lunar farside highlands suggests tidal heating played a role in the formation and
structure of the crust.

9:30 a.m. Perera V. * Garrick-Bethell I.
Lunar Asymmetry: Coincidence of the Degree-1 and Degree-2 Features due to a Rayleigh-Taylor
Instability and Reorientation [#2750]
We explore some of the possible explanations for the lunar asymmetry, and using the new finding of the
farside structure, propose a mechanism that might be able to explain the cause of the asymmetry.

9:45 a.m. Jutzi M. * Asphaug E.
The Lunar Farside Highlands as the Late Accretion of the Moon’s Companion [#2126]
The most immediate geological feature of the Moon is the terrain and elevation dichotomy. We explore
the origin of the lunar dichotomy as a late carapace added by the accretion of a companion moon.

10:00 a.m. Charlier B. * Namur O.
Anorthosite Formation by Plagioclase Flotation in Ferrobasalt and Implications for the
Lunar Crust [#1541]
The processes related to floating and sinking of plagioclase in the Sept Iles layered intrusion serves as a
proxy to refine the crystallization model of the lunar magma ocean and explain the vertically stratified
structure of the lunar crust.

10:15 a.m. Sakai R. * Kushiro I. Nagahara H. Ozawa K. Tachibana S.
Feo and Refractory Elements of Lunar Magma Ocean Constrained by Condition of Anorthosite
Crust Formation [#1636]
The bulk composition of the lunar magma ocean was constrained by developing a new model to satisfy
the physics and chemistry of the magma ocean that formed the upper crust exclusively consisting of
anorthosite with the thickness of several tens km.

10:30 a.m. Uemoto K. * Ohtake M. Haruyama J. Matsunaga T. Yokota Y. Nakamura R. Morota T.
Yamamoto S. Kobayashi S. Iwata T.
Geological Structure from Anorthosite Distribution of the Lunar South Pole-Aitken Basin Based on
Data Derived from SELENE Multiband Imager [#1722]
SPA basin is one of the biggest basins on the lunar far side. We analyzed the geological structure of this
basin by investigating the distribution of anorthosite within this basin and comparing the results with the
topographic data.

10:45 a.m. Borg L. E. * Connelly J. N. Boyet M. Carlson R. W.
The Age of Lunar Ferroan Anorthosite 60025 with Implications for the Interpretation of Lunar
Chronology and the Magma Ocean Model [#1171]
The age of the lunar FAN 60025 has been determined to be 4360 ± 3 Ma using $^{207}$Pb-$^{206}$Pb, $^{147}$Sm–
$^{144}$Nd, and $^{146}$Sm–$^{142}$Nd isotopic systems..
Sm-Nd and Ar-Ar Studies of Dho 908 and 489:  Implications for Lunar Crustal History [#2368]
Sm-Nd isotopic systematics are well defined for most lunar FANs, consistent with derivation from the lunar magma ocean. Some anorthosites, including both Apollo samples and meteorite clasts, have anomalous isotopic systematics, suggesting an alternate origin.

11:15 a.m.  Elardo S. M. *  McCubbin F. M.  Shearer C. K. Jr.  Draper D. S.
Mechanisms for the Depletion of Chromium in Mg-Suite Parental Magmas [#2309]
Cr in olivine from the lunar Mg-suite is much lower than what would be expected if early magma ocean cumulates are the Mg-suite source rocks. We explore mechanisms by which early LMO cumulates or Mg-suite parental magmas could be depleted in Cr.

11:30 a.m.  Gross J. *  Treiman A. H.  Filiberto J.
Constraints on the Geochemical Variations and Evolution of the Lunar Crust and Mantle as Revealed by Fe, Mn and Cr Concentrations in Olivine [#2805]
Olivine compositions in lunar meteorite ALHA81005 show a range of Fe/Mn and Cr/Fo ratios, reflecting a complex petrogenetic history. We use these concentration ratios to constrain the formation and oxygen fugacity history of the lunar crust and mantle.

CARBON ON MARS:  SURFACE TO ATMOSPHERE AND IMPLICATIONS FOR EXOBIOLOGY
Tuesday, 1:30 p.m.  Waterway Ballroom 1

Chairs:  Hans Amundsen and James Wray

1:30 p.m.  Wray J. J. *  Murchie S. L.  Ehlmann B. L.  Milliken R. E.  Seelos K. D.  Noe Dobrea E. Z.
Mustard J. F.  Squyres S. W.
Evidence for Regional Deeply Buried Carbonate-Bearing Rocks on Mars [#2635]
Carbonates are key minerals for understanding ancient martian environments. CRISM orbital spectroscopy reveals a spectral phase consistent with Fe- and/or Ca-rich carbonate exposed from the subsurface by impact craters across a ~1000-km-wide region.

1:45 p.m.  Niles P. B. *  Michalski J.
Evolution of CO₂ and H₂O on Mars:  A Cold Early History? [#2471]
Recent high-precision isotopic measurements of the martian atmosphere and discoveries of carbonates on the martian surface provide new constraints that we use to model the history of the martian climate and test the cold early Mars scenario.

2:00 p.m.  Shaheen R. *  Thiemens M.
Oxygen Isotope Anomaly in Terrestrial Atmospheric Carbonates:  Earth and Mars Linkage [#1677]
Oxygen isotope anomaly in µm sized terrestrial carbonates (0.4–3.9‰) have been identified for the first time and its implications to understand isotopically anomalous carbonates found in the SNC martian meteorites will be discussed using laboratory and field data.

2:15 p.m.  Ruff S. W. *
Is Comanche Carbonate Evidence for a Lake in Gusev Crater, Mars? [#2708]
Evidence from Mini-TES spectra and MI images support the idea that Comanche carbonate was produced by the precipitation of mixed Mg and Fe-rich carbonates in Algonquin class rocks, perhaps by evaporation of a brine.
2:30 p.m.  Blake D. F. *  Treiman A. H.  Morris R.  Bish D.  Amundsen H. E. F.  Steele A.  
*Carbonate Cements from the Sverrefjell and Sigurdfjell Volcanos, Svalbard Norway: Analogs for Martian Carbonates [#2167]*
Carbonates from volcanos in Svalbard, Norway are the best analogs for martian carbonates from the ALH 84001 meteorite, the Comanche carbonate at Gusev Crater, and the Nili Fossae carbonate. The mineralogy of these cements is described.

2:45 p.m.  Morris R. V. *  Blake D. F.  Bish D.  Ming D. W.  Agresti D. G.  Treiman A. H.  Steele A.  Amundsen H. E. F.  AMASE Team  
*A Terrestrial Analogue from Spitsbergen (Svalbard, Norway) for the Comanche Carbonate at Gusev Crater, Mars [#1699]*
Carbonate from the Bockfjord volcanic complex on the island Spitsbergen (Svalbard, Norway) is a terrestrial analogue for the Comanche carbonate at Gusev Crater.

3:00 p.m.  Amundsen H. E. F. *  Benning L.  Blake D. F.  Fogel M.  Ming D.  Skidmore M.  Steele A.  AMASE Team  
*Cryogenic Origin for Mars Analog Carbonates in the Bockfjord Volcanic Complex, Svalbard (Norway) [#2223]*
Carbon and oxygen isotope data on Mars analog carbonates in the Bockfjord Volcanic Complex on Svalbard indicate that they formed by cryogenic processes during freezing of basalt hosted aquifers following subglacial eruptions.

3:15 p.m.  Halevy I. *  Eiler J. M.  
*Carbonates in ALH 84001 Formed in a Short-Lived Hydrothermal System [#2512]*
Clumped isotope thermometry suggests that the carbonates in ALH 84001 formed in shallow hydrothermal systems, at temperatures just below 100°C, from water that was isotopically light and in contact with the ancient atmosphere.

*Organic Carbon Features Identified in the Nakhla Martian Meteorite [#2673]*
We report, for the first time, the identification of specific carbonaceous phases present within iddingsite alteration zones of the Nakhla meteorite that possess discrete, well defined, structurally coherent morphologies.

3:45 p.m.  Fu Q. *  Socki R. A.  Niles P. B.  
*Carbon Isotope Systematics in Mineral-Catalyzed Hydrothermal Organic Synthesis Processes at High Temperatures and Pressures [#1057]*
Experiments involving mineral-catalyzed hydrothermal organic synthesis processes were conducted at high temperatures and pressures. Carbon isotope data of generated organic compounds were used to unravel the reaction pathways.

4:00 p.m.  Craddock P. R. *  Dauphas N.  
*Assessing the Antiquity of Microbial Metal Respiration in the Geologic Record [#1148]*
We present Fe and C isotope data of Fe-carbonates in Archean banded iron formations (Hamersley, Australia and Isua, Greenland) that support their formation in marine sediments by microbial Fe respiration and record evidence of Fe catabolism at 3.8 Ga.

4:15 p.m.  Schwenzer S. P. *  
*Quantifying Low Temperature Production of Methane on Mars [#1803]*
Potential anorganic production of methane from a range of martian rock compositions is quantified and compared to the concentration of methane observed on Mars. Impact-craters are suggested as potential sites of methane formation and storage.
4:30 p.m.  Zahnle K. *  Freedman R.  Catling D.
*Is There Methane on Mars? Part II [2427]*
There have been several reports of transient methane in the martian atmosphere at 10–60 ppbv. We
review why abundant variable methane on Mars should be seen as an extraordinary claim and show why
the published reports fall short of providing extraordinary evidence.

---

**COSMOCHEMICAL ORIGINS II: ISOTOPIC CONSTRAINTS ON EARLY SOLAR SYSTEM CHRONOLOGY**

**Tuesday, 1:30 p.m.  Waterway Ballroom 4**

**Chairs:**  Audrey Bouvier and Dimitri Papanastassiou

1:30 p.m.  Kruijer T. *  Sprung P.  Kleine T.  Leya I.  Wieler R.
Using noble gases we identified iron meteorite specimens whose W isotope budgets likely remained
unaltered by cosmic rays. The Hf-W systematics of these samples indicate that their parent bodies
segregated their cores within 0.5 Ma of each other.

1:45 p.m.  Dauphas N. *  Pourmand A.
*Very Rapid Accretion of Mars and Implications for its Magmatic Evolution [1040]*
We present a new method to estimate the Hf/W ratio of the martian mantle from which we conclude that
Mars was a stranded planetary embryo formed within a few million years of solar system formation.

2:00 p.m.  Wimpenny J. B. *  Yin Q.-Z.  Tollstrup D.
*Constraining the Age of Partial Melting on the Brachinite Parent Body by Investigating Al-Mg Systematics in Brachina and Paired Achondrites GRA06128/9 [2473]*
We investigate Al-Mg systematics in the paired achondrites GRA06128/9 and Brachina. Both GRA meteorites have a resolvable excess of $^{26}$Mg, and a crystallisation age of 4564.9 Ma. This is ~0.5 Ma older than previous estimates for GRA.

2:15 p.m.  Bouvier A. *  Brennecka G. A.  Sanborn M. E.  Wadhwa M.
*U-Pb Chronology of a Newly Recovered Angrite [2747]*
We present a preliminary Pb-Pb isochron age for a newly recovered angrite of 4561.29 ± 0.78 Ma
(using $^{238}$U/$^{235}$U = 137.84; we are in the process of measuring the U isotope composition). This is
equivalent to the reported age of the NWA 2999 angrite.

2:30 p.m.  Sanborn M. E. *  Carlson R. W.  Wadhwa M.
*Sm-$^{147,146}$Nd and Rb-$^{87}$Sr Systematics of the Angrites Northwest Africa 4590, Northwest Africa 4801, and D’Orbigny [2369]*
We report the initial results of an investigation of the Sm-Nd and Rb-Sr isotope systematics of the
angrites Northwest Africa 4590, Northwest Africa 4801, and D’Orbigny.

2:45 p.m.  Hans U. *  Kleine T.  Bourdon B.
*Strontium isotope Anomalies in Ca-Al-Rich Inclusions and the Rb-Sr Chronology of Volatile Depletion Revisited [2672]*
We present high precision Sr isotope data for basaltic achondrites and CAI that lead to timescales of
accretion and volatile depletion significantly different from those calculated previously.
3:00 p.m. Mishra R. K. * Chaussidon M. Luu Tu. H.
Petropraphic and High precision Al-Mg Isotope Systematics of a ype B CAI from Vigarano [#2110]
High precision Al-Mg isotope systematics can allow us/one to establish the early solar system chronology.

3:15 p.m. Connolly H. C. Jr * Huss G. R. Shahar A. Nagashima K. Young E. D. Ebel D. S.
Weisberg M. K. Beckett J. R. Paque J. M. Ma C. Rossman G. R.
Diffusion Within the CAI Bocce Ball 1: The Redistribution of 26Mg* Correlated with Variation in Al/Mg Within a Type B2 Inclusion from Allende [#1858]
We analyzed the CAI Bocce Ball 1 from Allende for 26Al-26Mg systematics by LA-MC-ICPMS and SIMS techniques and find variations in radiogenic Mg correlated with Al/Mg ratio of anorthites near the edge of the inclusion but not in the center or within other phases.

3:30 p.m. Shukolyukov A. * Lugmair G. W. Irving A. J.
Mn-Cr Isotope Systematics and Excess of 54-Cr in Metachondrite Northwest Africa 3133 [#1527]
We obtained a $^{53}\text{Mn}/^{55}\text{Mn}$ ratio of $(1.83 \pm 0.23) \times 10^{-6}$ at the time of isotope closure. This translates into an absolute age of $4561.5 \pm 0.4$ Ma. The excess of $^{54}\text{Cr}$ indicates that the precursor of this meteorite was a carbonaceous chondrite material.

3:45 p.m. Papanastassiou D. A. * Chen J. H.
Revisiting Cr in the Eagle Station Pallasite and Its Suggested Affinities to Carbonaceous Chondrites [#2195]
Mn-Cr in Eagle Station shows heterogeneous $^{54}\text{Cr}$ abundance between chromite and olivine, with $^{54}\text{Cr}$ elevated in olivine, potentially due to spallation. The $^{54}\text{Cr}$ data do not support an affinity of precursors of Eagle Station and carbonaceous chondrites.

4:00 p.m. Ogliore R. C. * Huss G. R. Nagashima K.
The Problem of Bias in Mass Spectrometry Ratio Estimation [#1592]
We derive the expectation value of two ratio estimators: the mean of individual ratios and the ratio of total counts. We show that calculating isotope ratios by computing the mean of a number of ratios can result in significant positive bias.

4:15 p.m. Telus M. * Huss G. R. Nagashima K. Ogliore R. C. Tachibana S. Jilly C. E.
Possible Heterogeneity of $^{60}\text{Fe}$ in Chondrules from Primitive Ordinary Chondrites [#2559]
We report the results of recent multicollection measurements of Fe and Ni isotopes in chondrules from primitive unequilibrated ordinary chondrites (UOCs). We also discuss the importance of using the correct data reduction method on initial ratios.

4:30 p.m. Spivak-Birndorf L. J. * Wadhwa M. Janney P. E.
$^{60}\text{Fe}-^{60}\text{Ni}$ Chronology of the D’Orbigny Angrite: Implications for the Initial Solar System Abundance of $^{60}\text{Fe}$ [#2281]
We present a study of the $^{60}\text{Fe}-^{60}\text{Ni}$ chronometer in D’Orbigny and other angrites. Whole-rock samples and mineral separates from D’Orbigny define a precise $^{60}\text{Fe}-^{60}\text{Ni}$ isochron, which is used to estimate the initial solar system abundance of $^{60}\text{Fe}$. 
4:45 p.m. Tang H. * Dauphas N.
*Constraints from Achondrites on the Initial $^{60}$Fe/$^{56}$Fe Ratio of the Solar System [#1068]*
We analyzed Fe-Ni systematics in eucrites and other types of achondrites, evidence of $^{60}$Fe presence was found in bulk eucrites and $^{60}$Fe/$^{56}$Fe initial ratio in the early solar system was estimated, which is identical to the results from bulk angrite data.

---

**IMPACTS: MODELING AND REMOTE SENSING**
Tuesday, 1:30 p.m. Waterway Ballroom 5

**Chairs:** Sarah Stewart and Gordon Osinski

1:30 p.m. Güldemeister N. * Durr N. Wünne mann K. Elbeshausen D. Hiermaier S.
*Propagation of Impact-Induced Shock Waves in Heterogenous Rocks Using Mesoscale Modeling [#1104]*
In the framework of the “MEMIN” project, the effect of porosity in dry and water-saturated sandstone on shock wave loading is investigated. We conducted a series of numerical experiments of shock wave propagation in porous material using macro- as well as mesoscale models.

1:45 p.m. Elbeshausen D. * Wünne mann K.
*The Effect of Target Topography and Impact Angle on Crater Formation — Insight from 3D Numerical Modelling [#1778]*
We present results of a comprehensive study comprising more than 1000 three-dimensional hydrocode simulations and give insight into the effect of impact angle and topography on the morphometry and morphology of impact craters as well as their formation process.

2:00 p.m. Johnson B. C. * Melosh H. J.
*Homogeneous Nucleation of Silica Dust Following a Hypervelocity Impact [#1069]*
We show how a careful treatment of homogeneous nucleation during a vapor cloud expansion leads to a model, which makes predictions that are consistent with observations. We also show that the size of nucleation products depends on the impactor size and impact velocity.

2:15 p.m. Goldin T. J. * Koeberl C.
*Interactions Between Hypervelocity Impact Ejecta and Planetary Atmospheres: From the Early Earth to Mars [#2766]*
Using a two-phase fluid flow code, we compare the reentry of high speed impact ejecta into the atmospheres of the modern Earth, the Archean Earth, Venus, and Mars.

*Shock Induced Vaporization of Silica: Implications for Giant Impact Events [#2263]*
The quantity of vapor created during a giant impact is important to a number of problems in the planetary sciences. We investigate vaporization of silica by performing multi-Mbar shock and release experiments on quartz.

2:45 p.m. Marinova M. M. * Aharonson O. Asphaug E.
*The Importance of Impactor Composition on the Geophysical Consequences of Planetary-Scale Impacts into a Mars-Like Planet [#2606]*
Planetary-scale impacts were ubiquitous in the final stages of planetary accretion. We explore the effects of impactor composition and internal structure on the geophysical and morphological consequences of these large impacts.
3:00 p.m. Stewart S. T. *  
*Impact Basin Formation: The Mantle Excavation Paradox Resolved* [#1633]
New insights into the multiphase flow of materials during impact basin formation reconcile excavation of the mantle with the limited distribution of olivine-rich deposits observed on the terraces of impact basins on the Moon and Mars.

3:15 p.m. Baker D. M. H. *  Head J. W.  
*Impact Basin Formation: Testing the Nested Melt-Cavity Model with New Catalogs of Peak-Ring Basins on the Moon and Mercury* [#1429]
Observations from new catalogs of the interior-ring and rim-crest diameters of peak-ring basins and protobasins on the Moon and Mercury are found to be consistent with the first-order predictions of the nested melt-cavity model for impact basin formation.

3:30 p.m. Daubar I. J. *  McEwen A. S.  Byrne S.  Dundas C. M.  Keska A. L.  Amaya G. L.  Kennedy M.  Robinson M. S.  
*New Craters on Mars and the Moon* [#2232]
New discoveries of recent, dated impacts on Mars now total 189. We have now discovered five new craters on the Moon using similar techniques and LROC data.

3:45 p.m. Ong L. *  Berger A. J.  Melosh H. J.  
*Characterization of a Corinto Crater Ray on Mars* [#1552]
We measured nearly 18,000 secondary craters within a crater ray located 360 km from Corinto Crater. The crater densities range from 4000 to 5500 craters per km², and have one of the highest areal densities observed on a planetary surface.

4:00 p.m. Robbins S. J. *  Hynek B. M.  
*Distant Secondary Craters from Lyot Crater, Mars, and Implications for Ages of Planetary Bodies* [#1330]
We identified thousands of secondary craters in distinct clusters up to 5200 km from their primary crater, Lyot, on Mars. Their properties, relation to Lyot, and broader implications to secondary cratering and planetary ages will be discussed.

4:15 p.m. Singer K. N. *  Nowicki L.  McKinnon W. B.  Schenk P. M.  
*Secondary Craters and Ejecta on Icy Satellites: Size-Velocity Distributions* [#1649]
This work addresses size-velocity distributions of secondary craters on Europa and elsewhere, to determine the largest size fragments that might be ejected from an icy satellite by a given impact and as a test of spallation models.

4:30 p.m. Bray V. J. *  Melosh H. J.  McEwen A. S.  Schenk P. M.  Morgan J. V.  Collins G. S.  
*Studying Cratering and Pit Formation Processes with Galileo and MRO DEMs* [#1570]
We are utilizing topographic profiles to investigate the process of crater formation and to develop constraints for the various formation mechanisms suggested for central pit craters, an unusual crater type seen most commonly on ice-rich bodies.
Recent Lunar Magnetism [#1675]
The magnetization of some young lunar samples has led to skepticism of the ancient core dynamo hypothesis. We present paleomagnetic studies of possibly the youngest lunar magnetization identified and present a likely explanation for the source.

New Lunar Meteorite NWA 2996: A Window into Highland Plutonic Processes and KREEP Metasomatism [#2111]
We describe new petrological results from the recently found lunar meteorite, NWA 2996 to test whether it could have originated from either the margin of the PKT or the SPA terrane, and to contribute to the understanding of lunar highland petrogenesis.

Intrusive and Extrusive Lunar Felsites [#1257]
We identified the silica polymorph in 19 lunar felsites as quartz. The felsites have similar composition to lunar silicic constructs. The presence of quartz in the felsites indicates that they originated intrusively rather than in a silicic dome.

Petrography and Geochemistry of Lunar Meteorite Dhofar 1442 [#1012]
Here we present the detailed petrography and geochemistry of lunar meteorite Dhofar 1442, the most incompatible-element-rich lunar regolith sample ever found, and model its major lithologic components and likely provenance.

The High-Pressure, High-Temperature Density of Primitive Lunar Melts [#1723]
New molecular dynamics simulations are combined with published experimental data to provide a synthesis of our knowledge of the density of primitive lunar melts.

Lithospheric Stress and Basaltic Magma Ascent on the Moon, with Implications for Large Volcanic Provinces and Edifices [#2587]
The response of the lunar lithosphere to mare loading creates a pressure distribution on dikes at basin margins that is particularly favorable to magma ascent, accounting for the presence of large volcanic provinces/edifices peripheral to Imbrium and Serenitatis.

Some Speculations on the Distribution of REE Between Orthopyroxene and Lunar Picritic Glass Melts at Multiple-Saturation Points [#2009]
Based on multiple-saturation experiments, our predictive model shows that REE partitioning in opx varies greatly with picritic glass melts, suggesting that this need to be considered in future trace-element modeling studies of lunar magma genesis.
3:15 p.m. Donohue P. H. *
*Petrogenesis of Apollo 17 High-Titanium Basalts Using Crystal Stratigraphy [#2833]*
This study investigates magma evolution through compositional changes across and between ilmenite, armalcolite, and pyroxene crystals.

3:30 p.m. Krawczynski M. J. * Grove T. L.
*Petrogenesis of Lunar High-Titanium Liquids: The Importance of fO2 on the Depth of Origin and Melt Structure [#2333]*
High-Ti glasses are remelts of lunar magma ocean cumulates. We present our experimental data on how the depth of origin for these magmas depends on fO2 as well as discuss their melt structure and possible relation to the high-Ti mare basalt suite.

3:45 p.m. Dygert N. * Liang Y. Hess P. C.
*Experimental Evidence for High Field Strength Element Incompatibility in Titaniferous Phases in Equilibrium with High Titanium Mare Basalts and Picritic Glass Melts [#1956]*
We conducted ilmenite-high Ti melt HFSE partitioning experiments at P-T-X relevant to the lunar mantle. Our Kds are lower than those previously reported and we demonstrate the dependence of ilmenite-melt HFSE Kds on the Ti content of picritic melts.

*Compton-Belkovich: Nonmare, Silicic Volcanism on the Moon's Far Side [#2224]*
LRO NAC and WAC images reveal nonmare volcanic features on a 26 x 32 km, high-reflectance terrain feature at the center of the Compton-Belkovich Th Anomaly. Dome shapes, high reflectance, and Diviner Christiansen Feature data indicate silicic volcanism.

4:15 p.m. Hagerty J. J. * Lawrence D. J. Hawke B. R.
*Thorium Abundances of Basalt Ponds in South Pole-Aitken Basin: Insights into the Composition and Evolution of the Far Side Lunar Mantle [#1431]*
We used forward modeling of Lunar Prospector thorium (Th) data derived from basalts in South Pole-Aitken basin to demonstrate that large expanses of basalt could be reliably used to obtain compositional information about the far side lunar mantle.

4:30 p.m. Yamamoto S. * Nakamura R. Matsunaga T. Ogawa Y. Ishihara Y. Morota T. Hirata N. Ohtake M. Hiroi T. Yokota Y. Haruyama J.
*Distribution of Olivine-Rich Sites in the South-Pole Aitken Basin Revealed by SELENE Spectral Profiler [#1184]*
We report the distribution of olivine exposures in the South-Pole Aitken basin discovered by the Spectral Profiler onboard the Japanese lunar Explorer SELENE (Kaguya).

EDUCATION AND PUBLIC OUTREACH: APPLYING WHAT WE KNOW TO TEACHER PROFESSIONAL DEVELOPMENT AND CITIZEN SCIENCE
Tuesday, 1:30 p.m. Montgomery Ballroom

Chairs: Brooke Hsu and Stephanie Shipp

1:30 p.m. Shupla C. * Shipp S. Allen J. Tobola K.
*Lessons Learned: Best Practices in Educator Workshops [#2828]*
In this presentation, we will share tidbits from the wealth of education research on best practices in professional development, integrated with the lessons we have learned from our own experiences.
A coordinated series of professional development workshops in Earth and planetary science for grade- and middle-school teachers is being developed at the PSI, with supporting instructional rock kits, scientific visualizations, and interactive web-based tools.

2:00 p.m. Jones A. J. P.* Hsu B. C. Bleacher L. V. Designing, Implementing, and Evaluating Thematic, Inquiry-Based, Standards-Aligned Professional Development Experiences for Educators Through NASA Mission Education and Public Outreach [#1812]
The lunar workshop series led by the LRO EPO Team is a successful, effective model of a scientific professional development experience that can serve as an example to professional development providers when planning and implementing science workshops.

2:15 p.m. Tobola K.* Allen J. Thematic Design: My Story is Better When Your Story is Better [#2834]
What does a well-designed thematic workshop look like? This is an attempt to describe the thematic approach to space science education that has been demonstrated in solar system exploration education forum workshops.

2:30 p.m. DISCUSSION led by Stephanie Shipp

3:00 p.m. Gay P. L.* Cormier S. Brown S. Huang D. Prather E. Brissenden G. Daus C. Moon Zoo Team Moon Zoo: Engaging the Public in Geomorphology, Learning, and Community [#1701]
The Moon Zoo citizen science project has involved over 40,000 people in annotating lunar features. We present studies into their motivations, interactions with web content, and the evolution of their understanding of lunar concepts over time.

3:15 p.m. Cormier S.* Prather E. E. Brissenden G. Lintott C. Gay P. Raddick J. Assessment of the Effect of Participation in the Moon Zoo Citizen Science Project on Content Knowledge [#2295]
The Moon Zoo project affords volunteers the opportunity to contribute to scientific research in a meaningful way by interacting with actual scientific data. We created a survey to measure the impact that participation in Moon Zoo has on user conceptual knowledge.

3:30 p.m. Day B. H.* Mitchell B. K. NASA Mission Applications of Citizen Science [#2472]
We examine citizen science programs implemented by a number of past and current missions. We discuss successes and challenges associated with these programs and how the lessons learned can be applied to future missions.

How can NASA Outreach help the citizen scientist? NASA Solar System Education and Public Outreach (EPO) may coordinate and disseminate a consistent process for receiving Jupiter and other outer planet observation data from citizen scientists.
4:00 p.m.  Hsu B. C. * Bleacher L. V. Daou D. Day B. Jones A. Shaner A. Shipp S.  
*International Observe the Moon Night: A Successful Means for Sharing Lunar Science with an  
International Audience [#1193]
There is global support for International Observe the Moon Night, as evidenced by the number of events  
in 2010, which represents an untapped potential for infusing lunar science into an event that has already  
reached hundreds of thousands of people.

4:15 p.m.  DISCUSSION led by Brooke Hsu
**POSTER SESSION I**
Tuesday, 6:00 p.m.  Town Center Exhibit Area

**PRESOLAR GRAINS**

Wopenka B.  Jadhav M.  Zinner E.

*Raman Analysis of High-Density Presolar Graphite Grains from the Orgueil Carbonaceous Chondrite* [#1162]

Raman spectra of high-density presolar graphite grains from Orgueil show that most grains indeed consist of graphitic sp² carbon with variable degree of crystalline disorder. However, 2/21 grains have spectra typical of amorphous sp² carbon.

Jadhav M.  Zinner E.  Amari S.  Maruoka T.

*More Ca and Ti Isotopic Ratios in High-Density, Presolar Graphite Grains from Orgueil* [#1599]

We present Ca- and Ti-isotopic data for presolar graphites. Confirming previous conclusions, our results indicate that some ¹³C-enriched grains that have extremely large Ca and Ti anomalies probably originate from born-again AGB stars.

Amari S.  Zinner E.  Gallino R.  Lewis R. S.

*Presolar Graphite from Murchison* [#1098]

We have analyzed 1642 graphite grains from four Murchison fractions. Many grains in lower-density fractions KE3 and KFA1 originated from supernovae. A significant number of grains in higher-density fractions KFB1 and KFC1 formed in low-metallicity AGB stars.


*Atom-Probe Tomographic Analyses of Meteoritic Nanodiamond Residue from Allende* [#2070]

We present the first successful atom-probe tomograph analyses of meteoritic nanodiamond residue from Allende. We developed new sample preparation techniques that significantly improve sample stability.

Verchovsky A. B.  Fisenko A. V.  Semjenova L. F.

*Isothermal Low-Temperature Combustion of Nanodiamonds from Orgueil: Release of Xe-P3 by Volume Diffusion* [#2551]

We applied isothermal low-temperature combustion to nanodiamonds separated from Orgueil and demonstrated that release of Xe-P3 is governed by Fick’s law volume diffusion.

Yabuta H.  Amari S.  Matsuda J.  Hasegawa T.  Kilcoyne A. L. D.

*Refinement of Phase Q Carbon Chemistry Through Comparison Study of Q-Gas Rich and Depleted Fractions from the Allende Meteorite* [#2837]

The acid resistant carbonaceous residue (Q gas rich), its oxidized residue (Q gas depleted) from Allende meteorite, and other Q-rich fractions obtained through suspension and physical separation of the meteorite are analyzed by Carbon-XANES.

Meier M. M. M.  Heck P. R.  Hoppe P.  Groener E.  Baur H.  Wieler R.

*Helium and Neon in 15 Presolar Silicon Carbide Grains of Type AB* [#1658]

A He and Ne analysis of 15 individual presolar SiC grains of type AB yielded one grain with ²¹Ne (and possibly ²⁰Ne) of probable nucleosynthetic origin.
Fujiiya W., Hoppe P., Ott U.
*Hints for Neutrino-Process Boron Recorded in Stardust from Supernovae* [#1371]
The average B-isotopic composition of seven SiC X grains shows a small excess of $^{11}$B. This result can be considered as a hint for neutrino-process B in SNeII; however, it reveals the complexity of B production, chemistry, and condensation.

Chen J. H., Papanastassiou D. A., Dauphas N.
*Anomalous Ca Isotopic Compositions in Leachates of Murchison* [#2440]
Leachates of Murchison show correlated $^{48}$Ca, $^{54}$Cr, and possibly $^{46}$Ca effects. The presence of both $^{48}$Ca, $^{54}$Cr supports a SNIa provenance, but the carrier for the Ca anomalies has to be identified. The $^{46}$Ca effects may originate in an s-type process.

Zhao X., Floss C., Stadermann F. J., Bose M., Lin Y.
*Continued Investigation of Presolar Silicate Grains in the Carbonaceous Chondrite Ningqiang* [#1982]
Seven Fe-rich presolar silicates, two presolar oxides, and one presolar complex grain were found in the Ningqiang C chondrite. Most of the presolar silicate/oxide grains are located in one single matrix area, with a high abundance of 256 ppm.

Leitner J., Hoppe P., Zipfél J.
*The Stardust Inventory of the CR Chondrites GRA 95229 and GRA 06100 Assessed by NanoSIMS* [#1713]
We investigated C- and O-anomalous grains in GRA 95229 and GRA 06100. Both meteorites display lower abundances of O-anomalous grains than other CRs, belonging to a presolar silicate-poor subset of meteorites within the CR group.

Kodolányi J., Hoppe P.
*Magnesium Isotope Measurements on Presolar Silicate Grains from AGB Stars* [#1094]
We present the Mg isotope composition of presolar silicate grains from AGB stars. The grains were found in the Acfer 094 carbonaceous chondrite. Our data provide information on the galactic chemical evolution and AGB-nucleosynthesis of Mg isotopes.

Trappitsch R., Leya I., Heck P. R.
*New Recoil Model for the Determination of Interstellar Resident Times of Presolar Grains* [#2171]
We present a new model to correct interstellar resident times of presolar grains for recoil loss effects. We also discuss implications of our calculations on $^3$He and $^{21}$Ne data from the literature.

Harada M., Takigawa A., Tachibana S., Nagahara H., Ozawa K.
*Kinetics of Spinel Formation Under Circumstellar Conditions* [#2840]
Spinel formation by a reaction between corundum and Mg gas was experimentally studied. The condensation coefficient was estimated to be $\sim 0.03$ at the supersaturation ratio of $\sim 10$, which is applicable to spinel formation in circumstellar environments.

---

**COSMOCHEMICAL ORIGINS I: PHOTOCHEMISTRY, TRANSPORT, AND DISK EVOLUTION**

Riofrío L. M.
*Lunar Orbit Anomaly and GM=tc$^3$ Cosmology* [#1630]
The Lunar Laser Ranging Experiment reports the Moon receding at an anomalous rate. Independent experiments show a lower rate. A cosmology where GM=tc$^3$ may explain the anomaly. As with Mercury, orbital discrepancies may have great implications.
Blome H.-J.  Wilson T. L.
Did Cosmology Trigger the Origin of the Solar System? [#1004]
Cosmological perturbations appearing as tidal forces in the local dynamics of the presolar nebular cloud are shown to correlate with the onset of acceleration in Friedmann-Lemaitre cosmology, using the deceleration parameter and Hubble tidal term.

Johnson T. V.  Lunine J. I.  Mousis O.
Planetesimal Compositions Around Other Stars [#1553]
Planetesimals formed beyond the snow-line around exoplanet host stars may have a greater range of rock and metal, carbon, and ice proportions than solar system planetesimals. In carbon-rich systems, condensates may be water-free.

Gaidos E.
Kepler Planets and a Model of Planet Accretion from an Evolving Disk [#1248]
Kepler is expected to detect hundreds of planets and can test predictions from formation models. Here, I describe an integrative planet formation model to make such predictions.

Suetsugu R.  Ohtsuki K.  Tanigawa T.
Effects of Planetesimals’ Random Velocity on Temporary Capture by a Planet [#1154]
Using three-body orbital integration (i.e. the Sun, a planet, and a planetesimal), we examine temporary capture of planetesimals initially on eccentric and inclined orbits about the Sun, and evaluate the rate of temporary capture.

Collins G. S.  Davison T. M.  Ciesla F. J.
Numerical Simulations of Sub-Catastrophic Porous Planetesimal Collisions [#1933]
Numerical simulations show that large sub-catastrophic collisions between porous planetesimals at speeds greater than 4 km/s can generate significant volumes of heated material that is retained on the surviving planetesimal.

Davison T. M.  Ciesla F. J.  Collins G. S.  O’Brien D. P.
The Role of Impacts in the Thermal Evolution of Planetesimals [#2254]
We calculate the post-impact thermal evolution of a planetesimal that has been heated in a hypervelocity collision, in order to determine the total volume of material that is heated by the impact and the resulting peak temperatures and cooling rates.

Lipman M. D.  Strait M. M.  Flynn G. J.  Durda D. D.
Investigation of Crystal Structure End-Members in Fragmentation Patterns of Disrupted Meteorites [#1303]
Comparing disruption distributions of hydrous and anhydrous chondritic meteorites.

Morlok A.  Sutton Y. C.  Braithwaite N. St. J.  Grady M. M.
Even More Chondrules Born in Plasma: Simulation of Gas-Grain Collisions [#1081]
We used plasma arcs to simulate gas-grain collisions in the solar nebula. Analyses of resulting droplets show similarity to chondrules. Also, first results of experiments under solar nebula conditions are presented.

Ma Q.  Matthews L. S.  Hyde T. W.
Charging of Interplanetary Dust Grains and Consequences for Aggregation [#1981]
Charging of interplanetary dust grains including the effects of ambient plasma, UV photoemission, and secondary electron emission is studied. Fractal aggregates in the same environment with different charging histories can have charges of opposite sign.

Growth Efficiency of Dust Aggregates through Collisions with a Great Difference in Their Sizes [#1730]
We carry out numerical simulations of collisions between different-sized dust aggregates to investigate the growth feasibility of dust at high velocity collisions in protoplanetary disks.
Hughes A. L. H.  Armitage P. J.  
*Outward Mixing of Hot Grains. Dependence of Crystallinity Compositions on Disk Parameters [#2058]*
Here we present a follow-up to our study of the outward mixing of hot grains in evolving protoplanetary disks presented in Hughes and Armitage 2010, considering the influence of other disk parameters, including the initial disk mass and the alpha-scaling of disk viscosity.

Ciesla F. J.  
*A High Resolution Model of Water Transport in an Evolving Protoplanetary Disk [#1583]*
Here we explore a new model for material transport in evolving protoplanetary disks, examining how the movement of particles of a wide variety of sizes impacts the overall distribution of water in a protoplanetary disk.

Yang L.  Ciesla F. J.  Lyons J. R.  Lee J.-E.  Bergin E. A.  
*Oxygen Isotope Anomalies in the Solar Nebula Inherited from the Proto-Solar Cloud [#1602]*
We model the formation and evolution of a protoplanetary disk and apply it to study how the isotopic variations in oxygen produced via CO self-shielding in the parent cloud core translate into variations in the solar nebula.

Dominguez G.  Jackson T.  Chakraborty S.  Thiemens M.  
*Measuring and Modeling Equilibrium and Non-Equilibrium Isotope Effects on Cold Dust Grain Surfaces [#2485]*
Following the suggestion of recent theoretical modeling, we present laboratory measurements of the triple-oxygen isotopic fractionations associated with molecular cloud processes such as evaporation and condensation.

Yamada A.  Nanbu S.  Kasai Y.  Ozima M.  
*Quantum Chemical Calculations on Photo-Dissociation of CO: D'Δ ← X'Σ+[#1707]*
CO self-shielding model assume photo-dissociation spectra of minor isotopologues shift from that of major isotopologue in wavelength. We report photo-dissociation spectra of CO molecules by using quantum chemical calculations.

Chakraborty S.  Davis R.  Ahmed M.  Jackson T. L.  Thiemens M. H.  
*Temperature and Wavelength Dependent Oxygen Isotopic Fractionation in the VUV Photodissociation of CO: Implications for the Solar Nebula [#1559]*
New oxygen-isotopic data on temperature and pressure dependency during photodissociation of CO at various VUV bands have been obtained. Effective oxygen-isotopic composition of the solar nebula will be discussed due to this photochemical process.

Ozima M.  Yamada A.  
*The Origin of the Primordial Noble Gas Isotopic Composition in the Solar System [#1088]*
In contrast to conventional wisdom, the solar noble gas is represented by the post-D burning Q-noble gas, from which the solar wind noble gas was fractionated.

Milam S. N.  Charnley S. B.  
*Observations of Isotope Fractionation in Prestellar Cores: Interstellar Origin of Meteoritic Hot Spots? [#2378]*
Fractionated isotopic material is found in many solar system objects, and suggested as tracers of interstellar chemistry. We present observations of the nitrogen and carbon isotopologues in cores where substantial molecular freeze-out has occurred.
COSMOCHEMICAL ORIGINS II: ISOTOPIC CONSTRAINTS ON EARLY SOLAR SYSTEM CHRONOLOGY

Pravdivtseva O. Lewis R. S. Meshik A. Hohenberg C. M.
*I-Xe System in Chemically Separated Orgueil Magnetites* [#2614]

Pure Orgueil magnetite was separated into fractions for the I-Xe study of different morphologies. Our results confirm the early onset of aqueous alteration in Orgueil at 1.8 ± 0.5 Ma after formation of CAIs, and suggest more than one iodine carrier in Orgueil magnetite.

Strashnov I. Gilmour J. D.
*RIMSKI (Resonance Ionization Mass Spectrometer for Krypton Isotopes) Applied to 81Kr-Kr Cosmic Ray Exposure Age Determinations of Eucrites* [#1871]

RIMSKI (Resonance Ionization Mass Spectrometer for Krypton Isotopes) has been developed and used to measure CRE ages on mg-size samples. 81Kr-Kr ages of four eucrites (Stannern, Bereba, Pasamonte and Sioux County) correspond to known literature values.

Boehnke P. Caffee M. W.
*Terrestrial Xenon in Noble Gas Reservoirs* [#2336]

Using numerical techniques, we have identified primitive meteoritic Xe constituents in terrestrial Xe reservoirs. Our calculations indicate that the dominant fissiogenic Xe contributor to MORB Xe is 244Pu.

Reedy R. C.
*Depth Profiles Calculated for Radionuclides Made in Meteorites by Energetic Solar Protons* [#2365]

Elemental rates for making 10Be, 26Al, 36Cl, 41Ca, and 53Mn in meteorites by solar protons were calculated as a function of preatmospheric depth and radius for radii 1–25 g/cm² and a slab. Recently evaluated cross sections and SCR fluxes were used.

Desch S. J. Krot A. Alexander C.
*Evidence for Irradiation of the Sun’s Transition Disk* [#2524]

We propose that irradiation of the Sun’s protoplanetary disk during the transition disk stage could have produced 36Cl and Li-isotope anomalies at the observed abundances, and possibly 53Mn as well.

*Renewed Search for FUN (Fractionated and Unidentified Nuclear Effects) in Primitive Chondrites* [#2216]

We have developed and are actively applying a method for rapidly searching for FUN CAIs in meteorite slabs of almost any dimension that does not require the removal of CAI inclusions from museum slab specimens.

Nagashima K. Huss G. R. Krot A. N. Yurimoto H.
*Disturbance of Magnesium Isotopes in Anorthite from an Allende CAI Inferred from Magnesium Isotope Mapping with Isotope Microscope* [#2447]

Distributions of Al/Mg ratio and Mg isotopes visualized by Al-Mg isotope mapping of an anorthite grain in an Allende CAI are consistent with redistribution of Mg isotopes through Mg self-diffusion within the grain during thermal processing of the CAI.

Tissot F. Dauphas N.
*Development of High Precision 238U/235U Ratio Measurements for Cosmochemical Applications* [#1082]

We developed a method for extraction, purification and high precision isotopic analyses of U, to resolve 238U/235U variations at the 0.1‰ level. Our results for several geostandards agree with already published values, with an uncertainty of ±0.04‰.
Amelin Y. Kaltenbach A. Stirling C. H.
*The U-Pb Systematics and Cooling Rate of Plutonic Angrite NWA 4590 [#1682]*
Pb-Pb isochrons for pyroxene and silico-phosphate from angrite NWA 4590 yield ages of 4557.93 ± 0.28 Ma and 4557.381 ± 0.066 Ma, respectively, calculated using the measured $^{238}\text{U}/^{235}\text{U}$ ratio of 137.789.

Huss G. R. Ogliore R. C. Nagashima K. Telus M. Jilly C. E.
*Dangers of Determining Isotope Ratios Using Means of Individual Ratios [#2608]*
In light of a demonstrated bias in isotopic results calculated by means of a set of ratios, we reanalyze data from a series of previously published studies. We find that some studies are OK, but some results are incorrect due to statistical bias.

Moseley G. E. Schönbächler M. Davies C. Horan M. F. Busefield A. Carlson R. W.
*Manganese-Chromium Isotope Systematics of Ordinary Chondrite Forest Vale (H4) and Enstatite Chondrite Indarch (EH4) [#1289]*
Mn-Cr isochrons were determined on mineral fractions of the ordinary chondrite Forest Vale and the enstatite chondrite Indarch. The initial $^{53}\text{Mn}/^{55}\text{Mn}$ of Forest Vale is in good agreement with existing literature while Indarch displays an older age than reported previously.

---

**EARLY SOLAR SYSTEM I: REFRATORY MATERIALS, ISOTOPIC ANOMALIES, AND THEIR SOLAR ORIGINS**

Marin-Carbonne J. McKeegan K. D. Davis A. M. MacPherson G. J.
*In-Situ Investigation of Silicon Isotope Compositions in a FUN Inclusion [#2764]*
Si isotopes of the FUN inclusion Vigarano 1623-5 show large degrees of mass fractionation in olivine and melilitite, confirming that 1623-5 crystallized while evaporating. In melilitite, O, and Si isotopes have been exchanged with a chondritic reservoir.

Moynier F. Day J. M. D. Bouvier A. Walker R. J. Podosek F. A.
*84Sr Anomalies in Carbonaceous Chondrites [#1239]*
Carbonaceous chondrites are enriched by 50 ppm in $^{84}\text{Sr}/^{86}\text{Sr}$ ratio compared to terrestrial samples. These results reflect heterogeneous distribution of the p-process nuclide $^{84}\text{Sr}$ in the early solar system.

van Acken D. Brandon A. D. Humayun M.
*Nucleosynthetic Osmium Isotope Anomalies in Enstatite and Rumuruti Chondrites [#1034]*
Enstatite and Rumuruti chondrites show similar Os isotopic anomalies as ordinary and carbonaceous, suggesting homogeneous distribution of an s-process Os carrier phase throughout the chondrite formation region.

Srinivasan G. Ali A. Jabeen I. Srinivasan S.
*Ba Isotope Composition of Tagish Lake Meteorite [#1953]*
The Tagish Lake meteorite was analyzed for Ba isotope composition, and different fractions show excess and deficit in s-process isotopes. The $^{135}\text{Ba}$ excess is modelled to have $^{135}\text{Cs}/^{133}\text{Cs}$ of $2 \times 10^{-3}$.

Burkhardt C. Kleine T. Dauphas N. Oberli F. Wieler R.
*Nucleosynthetic Mo Isotope Anomalies in Acid Leachates of the Murchison Chondrite and Their Relevance for Early Solar System Processes [#2592]*
Mo-isotopic anomalies in Murchison leachates and an acid residue are consistent with variable amounts of s-process Mo and correlate with anomalies in Zr, but not with the ones in Os. Implications for planetary-scale nucleosynthetic anomalies are discussed.
Nagashima K. Krot A. N. Huss G. R. Yurimoto H.  
Oxygen Isotope Distributions in Type A CAIs from Kaba, CV Carbonaceous Chondrite [2509]  
Oxygen-isotope mapping on melilite-rich CAIs from the least-metamorphosed CV chondrite, Kaba, shows $^{16}$O-rich melilites are common and O-isotope distributions in melilites are complex and highly heterogeneous.

Rubin A. E.  
A New Model for the Origin of Type-B CAIs [1015]  
Most CAIs formed near the Sun, but Type-Bs formed in the CV-CK region after Type-As collided inelastically, incorporated some forsterite-rich dust, melted and partially evaporated. B3s formed after greater amounts of forsterite were incorporated.

Lin B. E. Weisberg M. K. Ebel D. S.  
Refractory Inclusions in MET 00426, a CR3 Chondrite [1297]  
A petrological description of the CAIs, AOAs, and chondrules of MET 00426 to test its classification as a CR3. We found evidence of pre-accretion alteration on one of the CAI’s rims, and find the meteorite is a highly unequilibrated assemblage.

Ivanova M. A. Lorenz C. A. Krot A. N. MacPherson G. J.  
Complex Refractory CAIs from The NWA 3118 and Efremovka CV3 Chondrites [1738]  
Several complex and compound refractory inclusions were discovered among a new suite of CAIs from the Efremovka and NWA 3118 CV3 chondrites.

Ivanova M. A. Krot A. N. Nagashima K. Lorencz C. A. Logan M. A. V. Kononkova N. N. MacPherson G. J.  
Compound CAIs Containing Zr-Y-Sc-Rich Inclusions from NWA 3118 and Efremovka CV3 Chondrites [1728]  
CAIs enriched in Zr, Sc and Y provide important records of the refractory element fractionation in the early solar nebula. We described mineralogy, petrology and oxygen isotopes of two Zr-rich CAIs from NWA 3118 and from Efremovka.

Solar-Wind Fe/Mg and a Comparison with CI Chondrites [1917]  
Fe and Mg solar-wind elemental abundances have been measured relative to Fe and Mg implants calibrated using RBS and ICPMS, respectively. Either CI Fe/Mg is high relative to average solar composition, or there is a large FIT-control on solar wind.

Heber V. S. Guan Y. Jurewicz A. J. G. Smith S. Olinger C. McKeegan K. D. Burnett D. S.  
Abundances of Carbon, Nitrogen and Oxygen in the Solar Wind Measured by Backside SIMS Depth Profiling [2642]  
C, N, and O in the solar wind (SW) are key elements to investigate elemental fractionation of the SW, required to deduce solar nebula abundances from SW data. We present first data on O, N, and C fluences in collected and returned SW samples from Genesis.

Lyon I. C. Kuhlman K. R. Burnett D. S.  
Cleaning Strategies and Depth Profiling of Genesis 60130 Silicon [2528]  
Further cleaning strategies for Genesis silicon 60130 were used to remove particulate matter and thin-film contamination. Surface analysis using TOF-SIMS showed that micrometer-sized particulates were, however, still present.

Burkett P. J. Rodriguez M. C. Allton J. H.  
Nuts and Bolts — Techniques for Genesis Sample Curation [1964]  
The Genesis curation staff at NASA JSC provides samples and data for analysis. We are showing: 1) techniques for characterization and measurement of shards; 2) allocation methods; and 3) status of the catalog by collector material, regime, and size.
Rodriguez M. C.  Burkett P. J.  Allton J. H.
Higher Magnification Imaging of the Polished Aluminum Collector Returned from the Genesis Mission [#1968]
The returned Genesis polished aluminum collector has had further optical microscope examination using higher magnification to document additional hypervelocity impact craters and surface contamination.

Recovery, Transpotation and Acceptance of the Curation Facility of the Hayabusa Re-Entry Capsule [#1638]
The Hayabusa re-entry capsule was safely carried into the Sagamihara Planetary Sample Curation Facility in JAXA on June 18, 2010. We report on the capsule recovery operation, and transportation and acceptance at the curation facility of the capsule.

Schmeling M.  Burnett D. S.  Jurewicz A. J. G.
Surface Characterization of Genesis Samples by Total Reflection X-Ray Fluorescence Spectrometry: Contaminants and Roughness Variations [#2041]
Surface analysis of Genesis solar wind samples by laboratory-based TXRF in conjunction with different cleaning procedures was carried out. Remaining contaminants and surface roughness were evaluated for different types of collector materials.

Reisenfeld D. B.  Steinberg J. T.  Wiens R. C.  Lepri S.  Raines J.
A Comparison of Solar Wind Conditions During the Genesis Mission with Forty Years of Solar Wind Observations [#2017]
To better understand how the solar wind sample collected during the Genesis mission relates to the average solar wind composition, we analyze the average plasma state of the solar wind during the Genesis mission and compare it to solar wind observations collected over the past 40 years.

Veryovkin I. V.  Tripa C. E.  Zinovev A. V.  Baryshev S. V.  Pellin M. J.  Burnett D. S.
Multielement RIMS Analysis of Genesis Solar Wind Collectors — Recent Progress Towards Better Accuracy [#2308]
We report on progress in measurements of Mg, Ca, and Cr fluences in Genesis samples by resonance ionization mass spectrometry. For the first time, we were able to clearly distinguish these solar wind elements from terrestrial surface contamination.

Wiens R. C.  Olinger C. T.  Reisenfeld D.
Ion Trajectory Simulations of the Genesis Solar Wind Concentrator Performance [#1555]
We describe improvements to Genesis Solar Wind Concentrator computer simulation, compare results to analyses made on the Concentrator target, and use these to predict the utility of the Concentrator target for analyses of other elements and isotopes.

Hutchinson J. A.  Wright D. M.  Milan S. E.  Grocott A.
A Superposed Epoch Analysis of Geomagnetic Storms Over a Solar Cycle [#2051]
We have completed and analysed a statistical superposed epoch analysis of geomagnetic storms over the last solar cycle, including CME/CIR driving differences, SW-M coupling, and an interesting new trend seen in the main phase duration with storm size.

---

EARLY SOLAR SYSTEM II: CHONDROLES AND AMOEBOID OLIVINE AGGREGATES

Mathieu R.  Pack A.
Constraining Chondrule Formation Using an Aerodynamic Levitation Apparatus [#2476]
In this abstract we describe a new apparatus used to clarify the formation mechanism of chondrules. Then, we will present our first results on thermal history constraints (heating temperature and cooling rates).
Kataoka K. Tachibana S. Takigawa A. Nagahara H. Ozawa K. Kogure T.
Condensation Experiments of Magnesium-Silicates Under Protosolar Disk Conditions: Condensates [#2839]
We carried out condensation experiments of Mg-silicates under controlled protoplanetary disk-like conditions, and obtained crystalline forsterite as condensates grown epitaxially on the forsterite substrate.

Hood L. L. Weidenschilling S. J.
The Planetesimal Shock Model for Chondrule Formation: Improved Orbital Simulations and Extended Shock Fronts [#2068]
The efficiency of potential chondrule formation in shock waves produced by planetesimals passing through jovian resonances is evaluated further using an improved planetesimal accretion and orbital evolution code.

Fedkin A. V. Grossman L. Ciesla F. J. Simon S. B.
Mineralogical and Isotopic Effects of Shock Wave Thermal Histories on Chondrule Precursors [#2123]
Improved models show very significant Mg, Si, and Fe evaporation from chondrule precursors in shock wave thermal histories that reach near-liquidus Ts, resulting in preservation of large internal isotopic heterogeneities, even at high-dust enrichments.

Sanders I. S.
Early Planetesimals as Reservoirs for Chondrule Materials [#2484]
Recent observations add to a growing body of evidence that chondrules were derived from the disruption of planetesimals, and were not formed by the melting of dust clumps.

Cristarela T. C. Sears D. W.
Classifying Chondrules Based on Cathodoluminescence [#1225]
Sears et al. (1991) proposed a scheme to classify chondrules based on cathodoluminescence color and electron microprobe analysis. This research evaluates that scheme and criticisms received from Grossman and Brearley (2005).

Lehner S. W. Petaev M. I. Zolotov M. Buseck P. R.
The Origin of Ninigerite in EH3 Silica-Bearing Chondrules [#1863]
Certain EH3 silica-bearing chondrules are enriched in Al, S, Na, Mn, and Si relative to CI chondrites and contain evidence that ninigerite formed from pyroxene and olivine via silicate sulfidation reactions.

Teplyakova S. N. Humayun M. Lorenz C. A. Ivanova M. A. Korochantsev A. V. Sadilenko D. A.
Trace Element Distribution Between Minerals of Nodules, Veins and Fine-Grained Metal Particles from Some Ordinary Chondrites [#1802]
Ordinary chondrites contain nodules are often depleted in HSE and Cu compared to fine-grained metal and enriched in W, Mo. We report preliminary results on major and trace element distribution in metal particles veins from four ordinary chondrites.

Patzer A. Hezel D. C. Bendel V. Pack A.
The Leoville CV3 Chondrite Revisited: Prime Material for the Study of Refractory Trace Elements [#1404]
We studied the petrography and chemical composition of constituents in the reduced CV3 chondrite Leoville, investigated their budgets of refractory trace elements, and calculated bulk REE proportions.

Hewins R. H. Zanda B. Bourot-Denise M.
The Formation of Type II Chondrules in CM Chondrites: The View from Paris [#1914]
In Paris (CM) Type II chondrules, olivine cores are Fa_{7-26} with Fa_{1-19} relics. Fe-Mn correlations show that CM and LL chondrules come from different reservoirs and formed by condensation of Fe and Mn onto Type I material in a late oxidizing environment.
Sierchio J. M.  Lauretta D. S.  Davidson J.

*Fe-Mg Diffusion Processes in Compound Chondrules in the NWA 505 Chondrite [#2000]*

We present the results of numerically modeling isothermal Fe-Mg diffusion processes in the NWA 505 chondrite. We also discuss the implications of these results for the thermal history and formation of compound chondrules in NWA 505.

Humayun M.  Burnett D. S.  Jurewicz A. J. G.

*Preliminary Magnesium Isotopic Composition of Solar Wind from Genesis SOS [#1211]*

We report the presence of isotopically light Mg (−4‰) extracted from cleaned Genesis SOS wafers.

Ushikubo T.  Kimura M.  Kita N. T.  Valley J. W.

*Primordial Oxygen Isotope Reservoirs of the Solar Nebula Recorded in Chondrules from Acfer 094 Carbonaceous Chondrite [#1183]*

Oxygen-isotope ratios of phenocrysts and glass in each chondrule from Acfer 094 are identical. Chondrules from Acfer 094 show a bimodal oxygen isotope distribution, indicating that they formed in two distinct oxygen isotope reservoirs.

Isa J.  Rubin A. E.  Marin-Carbonne J.  McKeegan K. D.  Wasson J. T.

*Oxygen-Isotopic Compositions of R-Chondrite Chondrules [#2623]*

We observed different O-isotopic compositions in three PO chondrules from the primitive R3.6 chondrite, PRE 95404. R chondrites are much more closely related to OC than to CC.

Tenner T. J.  Ushikubo T.  Kurahashi E.  Kita N. T.  Nagahara H.

*Oxygen Isotopic Measurements of Phenocrysts in Chondrules from the Primitive Carbonaceous Chondrite Yamato 81020: Evidence for Two Distinct Oxygen Isotope Reservoirs [#1426]*

Mineral compositions and oxygen isotope ratios of chondrules from Y-81020 (CO3.0) were investigated. Bimodal distribution of O isotopic ratios may suggest two distinct reservoirs within the carbonaceous chondrule-forming region.

Morris M. A.  Janney P. E.  Hines R.  Wadhwa M.

*26Al–26Mg Systematics of Selected Chondrules from Allende and Semarkona [#2773]*

We report initial results from LA-MC-ICPMS analyses of Mg isotopes in selected chondrules in Allende and Semarkona, which suggest these chondrule formed no earlier than ~1 Ma and no later than ~3 Ma after CAIs.

Das J. P.  Meshik A. P.  Pravdivtseva O. V.  Hohenberg C. M.

*A First Test of a New Analyte.193 Laser Ablation System: In-Situ Helium, Neon and Argon Compositions of Chondrule Zones and Surrounding Matrix in NWA 801 CR2 Chondrite [#2238]*

A new excimer laser is attached to the noble gas mass spectrometer at St Louis Noble Gas Laboratory. This abstract discuss the first test with this new set up and report primary results obtained during this test for the chondrules of NWA 801 CR2 chondrite.

Varela M. E.  Zinner E.  Kurat G.  Magnelli D. E.

*Acfer 182 Chondrules Give Evidence for Direct Condensation of Enstatite-Rich Liquids from the Solar Nebula [#1497]*

We report the results of major- and trace-element studies of some CC chondrules in Acfer 182. The patterns could reflect condensation of the enstatite-rich liquids from a gas from which variable proportion of refractory phases had been removed.
Izawa M. R. M. Flemming R. L. Banerjee N. R.
QUE 94204: A Primitive Enstatite Achondrite Produced by Partial Melting of an E-Chondrite-Like Protolith [#1275]
QUE 94204 is a coarse-grained, recrystallized, chondrule-free, unbrecciated rock dominated by equigranular enstatite, with textural, mineral, and chemical characteristics consistent with an origin via partial melting of an E-chondrite-like precursor.

Dating the Earliest Felsic Asteroidal Crust in the Solar System: U-Pb Age of Phosphate from Antarctic Achondrite GRA 06129 [#2424]
Apatite U-Pb ages were determined from the first known andesitic meteorite GRA 06129 by the Cameca ims1280 ion probe.

Claydon J. L. Crowther S. A. Shearer C. K. Gilmour J. D.
I-Xe and Other Xenon Isotope Systematics in Irradiated GRA 06129 [#2127]
Xe isotopes produced from I, Ba and U are released together in four high T ranges, implying distinct host phases associated with plagioclase. Peak $^{129}$Xe/$^{132}$Xe data are consistent with previous analyses, but no I-Xe correlation is observed.

Senshu H. Usui T.
Numerical Study on the Thermal Evolution and Birthplace of GRA 06128 and 06129 [#2514]
We carried out numerical simulation on the thermal evolution of the GRA parent body under a wide variety of parameters to constrain the physical condition and thermal evolution and birthplace of GRA.

Hunt A. C. Benedix G. K. Strekopytov S. Unsworth C. Hammond S. J. Bland P. A.
The Major and Trace-Element Composition of the Winonaites: Evidence for Heterogeneity and Implications for Geochemical Analysis [#1809]
Winonaites are primitive achondrites with chondritic mineralogy and textures which suggest partial melting. We aim to elucidate the thermal history of the winonaites/IAB parent body with new bulk major and trace element data.

Lorenz C. A. Teplyakova S. N. Humayun M. Ivanova M. A. Franchi I. Greenwood R.
Origin of the Ungrouped Achondrite NWA 4518: Mineralogy and Geochemistry of FeNi-Metal [#1291]
Ungrouped achondrite NWA 4518 is an ultramafic breccia with abundant siderophile rich IIA-like metal. Its silicate chemistry is similar to that of WINs, HEDs, and silicate inclusions of IIE irons. Oxygen isotopic composition is nearby IAB-IIICD-WIN.

Lorenz C. A. Kononkova N. N. Stehlik H. Franchi I. A. Greenwood R.
NWA 6356: Unequilibrated Polymict Ureilite [#1293]
Polymict ureilite NWA 6356 has not suffered an intensive metamorphism and keeps the evidence of multistage carbon injections, reducing sulphuric metasomatism, and consists of feldspathic clasts and best preserved CM-like chondrite fragments.

Shih C.-Y. Nyquist L. E. Reese Y. Goodrich C. A.
Sm-Nd Isotopic Studies of Ureilite Novo Urei [#1627]
Sm-Nd isotopic analyses were performed on three bulk rock samples of ureilite Novo Urei. Both $^{143}$Nd/$^{144}$Nd and $^{142}$Nd/$^{144}$Nd data of the bulk rock support for a young metasomatism event at ~4.1 Ga ago on ureilite parent bodies.
Jercinovic M. J.  Goodrich C. A.
Primary Chromite in Two More Main Group Ureilites — NWA 3109 (Fo 76) and EET 96328 (Fo 85). What Does Cr in Ureilites Tell Us? [#1152]
Primary chromite has previously been reported in only two, very ferroan (Fo 75–76) ureilites. We describe chromite in two more ureilites, one of which is Fo 85. The behavior of Cr in ureilites does not support the inference that Fo is correlated with $f_O^2$.

Goodrich C. A.  Wilson L.  Michel P.  Hartmann W.  Sykes M. V.
What Is and What Isn’t Wrong with Equilibrium Smelting Models for Ureilite Petrogenesis [#1233]
Equilibrium smelting is a debated model for ureilite petrogenesis. We discuss several arguments that have been raised against this model. Some of these arguments are valid and some of them are not.

Hoffmann V. H.  Torii M.  Funaki M.  Hochleitner R.  Kaliwoda M.  Mikouchi T.  Zolensky M.
Magnetic Phases of Almahata Sitta: New Results [#2191]
The multitude of magnetic phases identified in the Almahata Sitta ureilite requires investigating their individual role in terms of (1) (paleo-) magnetic record, origin and meaning, (2) physical and mineralogical background, as well as (3) petrogenesis and petrofabric.

Kaliwoda M.  Hoffmann V. H.  Hochleitner R.  Mikouchi T.  Gigler A.
New Raman Spectroscopy Data of Almahata Sitta [#2225]
Raman spectroscopy represents a highly valuable tool in support of our investigations on the magnetic signature of Almahata Sitta. Our main focus is on the Raman data collection of suessite and other unusual iron compounds in planetary materials.

Mineralogical and Trace-Element Constraints on the Petrogenesis of Angrites [#2229]
Texturally and compositionally diverse angrites are ancient solar system materials derived from multiple magma batches.

Mikouchi T.  Sugiyama K.  Satake W.  Amelin Y.
Mineralogy and Crystallography of Calcium Silico-Phosphate in Northwest Africa 4590 Angrite [#2026]
We performed XRD on Ca silicophosphate (CSP) in the NWA 4590 angrite and found that it had an apatite structure. Since this result is consistent with our earlier work on CSP in other angrites by Raman and EBSD, all CSP in angrites may be silico-apatite.

IRON METEORITES AND PALLASITES

Powell K. E.  Chabot N. L.
Crystallization of the IIIAB Iron Meteorite Group: Multi-Element Modeling Results [#1065]
We model fractional crystallization in the IIIAB iron meteorites for 10 elements, some of which are modeled for the first time for this group.

Teplyakova S. N.  Lorenz C. A.  Ivanova M. A.  Korochantsev A. V.  Borisovsky S. E.  Franchi I. A.  Humayun M.
The New Silicate-Bearing Iron Meteorite NWA 6369 Paired to NWA 5549 [#1260]
NWA 6369 is a recent iron meteorite find with silicate inclusions, most probably paired with NWA 5549. Here we report preliminary results on petrography, mineralogy, and chemistry of NWA 6369.

Dar al Gani 962: A Libyan Silicated IAB Iron with Similarities to Landes [#1625]
Further characterization of a silicated iron meteorite with textural and mineralogical similarities to Landes.
Moskovitz N. A.  Walker R. J.  
*Sizes of Iron Meteorite Parent Bodies: Constraints from the Age and Composition of the IVA Muonionalusta* [1072]
We present a new model for the formation of the IVA iron meteorites that addresses a recent U-Pb age for the IVA Muonionalusta, compositional data, and metallographic cooling rates. We find that the IVA parent was smaller than previously estimated.

Wasson J. T.  Scott E. R. D.  
*Group IIE Iron Meteorites: Metal Composition, Formation, Relationship to Ordinary Chondrites* [2813]
INAA data for metal in 8 new and 12 known IIE irons show they crystallized from various silicate-rich Fe-Ni melts with diverse S contents after impacts melted an ordinary chondrite asteroid that was probably more reduced than H chondrites.

Horan M. F.  Carlson R. W.  Alexander C. M. O’D.  Blichert-Toft J.  
*Palladium-Silver Isotopic Systematics in Muonionalusta and Fractionation in the IVA Iron Meteorite Parent Body* [1311]
Palladium-silver isotope data for Group IVA iron meteorite Muonionalusta (Pb-Pb age = 4565 Ma) suggest lower initial $^{107}$Pd than chondrites, higher Pd/Ag prior to troilite crystallization, and ~8% S in the bulk meteorite.

*$^{10}$Be, $^{26}$Al, and $^{36}$Cl in Iron Meteorites: Implications for Osmium Isotope Systematics* [1262]
From $^{10}$Be, $^{26}$Al, and $^{36}$Cl activities for six irons we infer shielding conditions and, assuming thermalization, estimate changes in Os isotope abundances due to neutron capture. Measured values are larger possibly because thermalization is incomplete.

Hu L.  Humayun M.  Wittig N.  
*Rhenium Isotopic Compositions of Iron Meteorites: Initial Results* [2487]
Isotopic composition of Re is precisely measured by MC-ICP-MS. No natural variations are observed.

McDermott K. H.  Greenwood R. C.  Franchi I. A.  Anand M.  Scott E. R. D.  
*Oxygen Isotopic and Petrological Constraints on the Origin and Relationship of IIE Iron Meteorites and H Chondrites* [2763]
New oxygen isotopic measurements of IIEs and H chondrites are indistinguishable — strengthening a possible common origin for these groups. Combining oxygen results with mineralogy, the nature of their parent body or bodies can be explored.

Ziegler K.  Young E. D.  
*Oxygen Isotope Compositions of Main Group Pallasites* [2414]
We present a $\Delta^{17}$O study of a single pallasite silicate aggregate. No inhomogeneity is found on such a scale, strengthening the argument for $\Delta^{17}$O differences between aggregates to explain the range and bimodal distribution of pallasite $\Delta^{17}$O values.

Huber L.  Cosarinsky M.  Cook D.  Leya I.  Herzog G.  
*Cosmic-Ray Exposure Ages of Pallasites Derived from Metal and Olivine Separates* [1848]
Cosmic-ray exposure ages of pallasites based on cosmogenic noble gas and radionuclide measurements on metal and olivine separates cluster around 100 My, suggesting that they may have been ejected in a single event from the same parent body.

*Implications of the Presence of Tridymite in the Fukang Pallasite* [1915]
Olivine grains in Fukang contain silica-rich inclusions. The identification of tridymite as the silica polymorph constrains the size of the pallasite parent body.
Harju E. R.  Rubin A. E.  Wasson J. T.

*A New Evaluation of Pallasite Cooling Rates* [#2595]

EMP studies of PMG taenite lamellae confirm they have higher central Ni contents at the same halfwidth than IIIAB irons. PMG may have cooled at lower rates, but other factors, such as shock effects, may also be influencing metal compositions.

---

**EDUCATION AND PUBLIC OUTREACH: METEORITES**


*The Asteroid-Meteorite Connection: Developing K-8 Curriculum and Activities in Educational Support of Asteroid Missions and Studies* [#2693]

Detailed description of science content and hands-on activities developed for teacher professional development workshop relating asteroid science and meteorite studies.

Albin E. F. M.

*Meteorics in the Middle School Classroom* [#2129]

Results are presented describing a classroom/lab activity about meteorites for middle school students. This activity seeks to provide 6th grade students with a hands-on appreciation for meteorites and how to distinguish meteorites from ordinary terrestrial rocks.

Hutson M. L.  Pugh R. N.  Ruzicka A. R.

*Meteorites on the Road: Taking Meteorite Science to Rural Communities* [#1269]

Summary of a three-year NASA E/PO project involving meteorite samples and a lecture at schools, libraries, and other locales in rural communities.

Beauford R. E.

*Meteorwrongs Received by the Arkansas Center for Space and Planetary Sciences. Program Results and Potentials* [#1100]

An examination of what can be learned from 197 “meteorwrong” samples and letters received and handled by university students and professors.

---

**ASTEROID DISRUPTION: ARTIFICIAL AND NATURAL**

Sánchez P.  Scheeres D. J.

*Rotational Reshaping and Yield Stress of Rubble-Pile Asteroids* [#2120]

Using a Soft-Sphere DEM code we simulate the rotational reshaping and disruption of a rubble-pile asteroid. We find that yield stress increases with the mass of the aggregate. Reshaping starts when a density dependent spin rate has been reached.

Kimberley J.  Ramesh K. T.  Barnouin O. S.  Ernst C. M.

*A Size Dependent Scaling Law Based on the Rate Dependent Strength of Rocky Bodies* [#2166]

A universal material model describing the rate dependent strength of brittle materials is used to develop a new scaling law for impact disruption in the strength regime. This new scaling is compared with observational data for small bodies.

Hartmann O.  Neukum G.

*The Mass-Depletion of the Asteroid Belt Estimated by a Lunar-Like Impact Chronology Model* [#2348]

The mass-depletion of the asteroid belt estimated by a lunar-like impact chronology model.
Leinhardt Z. M.  Stewart S. T.  
*Empirical Scaling Laws for Collisions Between Gravity Dominated Objects [#1591]*
We present empirical scaling laws for collisions between gravity-dominated objects. The equations predict the mass, size, and velocity dispersions of the remnants and describe the dependence of the outcome on the collision parameters.

Korycansky D. G.  Asphaug E.  
*Disruption Criteria and Post-Impact Void Fractions for Brick-Pile Planetesimals [#1282]*
We report on critical disruption criteria and void fractions after collisions for so-called “brick-pile” kilometer-scale planetesimals.

Weaver R. P.  Plesko C. S.  Dearholt W. R.  
*Los Alamos RAGE Hydrocode Simulations of Effective Mitigation of Porous PHO Objects [#1145]*
We use the RAGE hydrocode to simulate surface/subsurface explosive mitigation of nonspherical asteroid models. The current simulations incorporate nonuniform composition, porosity of the object, and various depths of burial of the explosive and show effective mitigation.

Plesko C. S.  Weaver R. P.  Huebner W. F.  
*Energy Deposition in Hazard Mitigation by Nuclear Burst: Sensitivity to Energy Source Characteristics, Geometry, and Target Composition [#2588]*
We present hydrocode and particle transport code models of energy deposition from nuclear bursts onto materials relevant to PHO mitigation. We find that momentum transfer is affected by burst geometry and PHO composition.

---

**ASTEROID STUDIES: FROM THE LAB TO THE MAIN BELT**

McAdam M. M.  Hibbitts C. A.  
*Temperature Dependence of Calcium and Sodium Montmorillonite at 2.6 μm [#1026]*
In laboratory experiments we observed changes in the spectra of calcium montmorillonite and sodium montmorillonite upon desiccation and subsequently upon cooling. Both clays exhibit temperature dependent changes near 2.6 μm.

*An Experimental Photometric Study of Natural Granular Surface Samples Using Hapke’s Model [#1785]*
We present an experimental photometric study of various granular volcanic surface samples using Hapke’s modeling. Variations of photometric parameters display specific trends that can be related to physical properties of the samples.

Hardersen P. S.  Mothé-Diniz T.  Cloutis E. A.  
*Constraining Meteorite Analogs for the Eos Dynamical Family via Mineralogical Band Analysis [#2184]*
The Eos dynamical family displays weak near-infrared Band I and Band II spectral absorptions that suggest the surface presence of olivine ± pyroxene. Band analysis will be undertaken to constrain the possible meteorite analogs for the Eos family.

*Albedo and Taxonomic Class Relationships of Near-Earth Objects Observed by the Wide-Field Infrared Survey Explorer (WISE) [#1219]*
This poster is a status report on a project that will determine the relationship between taxonomic class and albedos of NEOs using those observed by WISE. The completion of this study will constrain the physical properties and compositions of NEOs.
Fieber-Beyer S. K.  Gaffey M. J.  Kelley M. S.  Reddy V.  Reynolds C. M.  Hicks T.  
*The 3:1 Kirkwood Gap and the Maria Family: Genetic Family Membership and Plausible Source Body of Mesosiderites [#1411]*  
The present research uses NIR spectra to identify possible links between MAF members adjacent to the 3:1 resonance and meteorites in the terrestrial collections.

Welivitiya W. D. D. P.  Sears D. W. G.  
*Analysis of Visual Reflectance Spectra of “Hungaria” Family of Asteroids [#1274]*  
By analyzing the reflectance spectra of Hungary asteroids we suggest that an impact between one of many X/E asteroids and one of many A/S asteroids is the most probable origin for the Hungary family of asteroids.

De Sanctis M. C.  Migliorini A.  Ammannito E.  Capria M. T.  Filacchione G.  Lazzaro D.  Luzia F.  Marchi S.  
*NIR Spectral Observations of Candidate V-Type Asteroids [#1668]*  
The asteroids we have observed were selected from different dataset of possible V-type asteroids. Spectral data are needed to confirm if these objects are V-type asteroids and hence to better understand their relationship with Vesta.

Bodewits D.  Kelley M. S.  Li J.-Y.  Landsman W. B.  A’Hearn M. F.  
*Swift Observations of the Ejecta of Asteroid 596 Scheila [#1462]*  
Early December 2010, an unexpected dust cloud was discovered around the asteroid 596 Scheila. We report on observations using the UV-Optical Telescope onboard Swift. The ejecta plume might be driven by volatiles or by a collision with another asteroid.

Nimura T.  Abe M.  Hiroi T.  Pieters C. M.  
*Estimating the Composition and the Degree of Space Weathering of Asteroids 6 Hebe, 433 Eros, and 25143 Itokawa by Reflectance Spectroscopy Using a New Modeling Approach [#1655]*  
We have estimated the mineral assemblage, chemical compositions of the component minerals, grain-size, and degree of space weathering of asteroids 6 Hebe, 433 Eros, and 25143 Itokawa from their visible and near-infrared reflectance spectra.

DeMeo F. E.  Binzel R. P.  
*SMASS-Next: A Next Generation Asteroid Spectroscopic Survey [#2055]*  
We present first results of an observing campaign using FIRE on the 6.5-m Magellan Telescope at Las Campanas Observatory Chile to obtain near-infrared spectra of subkilometer near-Earth objects.

Marchis F.  Enriquez J. E.  Emery J. P.  
*NIR Spectroscopic Study of Multiple Asteroid Systems [#2035]*  
We are conducting a survey using an IRTF/SPEX instrument to derive the taxonomic class of this interesting subpopulation of SSSSBs. The spectra of 21 of them were recorded in 2008 and 2010 and will be presented in this work.

*Spectral Reconnaissance for 200 Near-Earth Object Mission Targets [#2226]*  
We present spectral characterization measurements for 200 near-Earth objects that are spacecraft mission candidates accessible with Delta-V of less than 7 km/sec.
Dave R. Emery J. P.

Near Earth Asteroid Thermal Modeling [NEATM] and Thermophysical Modeling of 10 Low Albedo NEAs Using Infrared Spectrograph (IRS) on NASA’s Spitzer Space Telescope [#2583]

In support of the ExploreNEOs campaign of the Warm Spitzer program, the current project is a study of a sample of NEAs using the Infrared Spectrograph on NASA’s Spitzer Space Telescope and Thermal (NEATM) and Thermophysical Modeling of the data.

**ASTEROID PHOTOGEOLGY**

Stooke P. J.

*New Photomaps of Phobos, Deimos, Itokawa, Steins, Wild 2 and Tempel 1 [#1312]*

Recent datasets support the compilation of new maps of satellites Phobos and Deimos, asteroids Itokawa and Steins, and comet nuclei Wild 2 and Tempel 1. Here they are presented and the differences from earlier maps are described.

Basilevsky A. T. Oberst J. Willner K. Waehlisch M. Neukum G.

*Grooves of Phobos as Seen on Rectified Images Taken by the Mars Express High Resolution Stereo Camera [#1486]*

In this work, we analyze images taken by the HRSC camera onboard Mars Express to revisit the problem of the origin of Phobos’ grooves, numerous linear features, often turning to chains of small craters, which criss-cross its surface.

Salamuničar G. Lončarić S. Pina P. Bandeira L. Saraiva J.

*Machine Detection and Global Catalog of Phobos Craters [#1451]*

Newly released topographic image atlas of Phobos was processed with our DEM-based and optical-based crater detection algorithms. The result is a new catalogue of 504 Phobos impact craters.

Horváth A. Illés-Almár E.

*Grooves on 21 Lutetia Indicate a Layered Structure [#1366]*

On the image of asteroid 21 Lutetia craters as well as grooves can be identified. On the basis of the existence of parallel grooves we suggest that Lutetia might be a near-surface block of an ancient, larger differentiated body.


*Physical Properties of Craters on Asteroid (21) Lutetia [#2417]*

This abstract presents the physical properties of craters derived from the measurement of depth/diameter ratios on asteroid (21) Lutetia. We show how the d/D ratio varies in different regions and how it can be used to better understand the processes that affected the surface.

**ASTEROID DISCOVERY AND EXPLORATION**


*Near-Earth Asteroid Survey Precursor to Human Exploration [#1820]*

The most urgent knowledge needed to prepare for human spaceflight to a near Earth object is the need to discover a sufficient number of suitable candidate targets. These targets can be discovered quickly and affordably by a space-based telescopic survey.
Savanevich V. E.  Kozhukhov A. M.  Bryukhovetskiy A. B.  Vlasenko V. P.  Dikov E. N.  Ivashchenko Yu. N.  Elenin L.

Program of Automatic Asteroid Search and Detection on Series of CCD-Images [#1140]
The paper presents a brief description of the program, which realized a new method of the finding low contrast moving objects for automatic asteroid detection by small telescopes, equipped with CCD cameras. The result of program usage is presented.

Kahn E. G.  Barnouin O. S.  Buczkowski D. L.  Ernst C. M.  Izenberg N.  Murchie S.  Prockter L. M.

A Tool for the Visualization of Small Body Data [#1618]
This paper describes a new software tool called the Small Body Mapping Tool that was developed to facilitate the task of searching, visualizing, and analyzing data returned from small body missions.

Harada T.  Kitazato K.  Hirata N.  Demura H.  Asada N.

A Rover Simulation Tool for Small Body Exploration [#1960]
We have developed a simulation tool of the hopping rover for small body exploration. This simulator implements physics-based computing of the rover motion and its visualization.

Kohout T.  Britt D.

Magnetic Susceptibility as a Tool for Asteroid Exploration [#1517]
Three methods of asteroid magnetic susceptibility determination are proposed. Magnetic susceptibility of asteroids of various clans can be used in the search for meteorite types of similar composition.

Lim L. F.  Nittler L. R.

The Effects of Surface Roughness on the NEAR XRS Elemental Results: Monte-Carlo Modeling [#2222]
Monte-Carlo simulations are used to evaluate the potential effects of surface roughness on the Fe/Si, Ca/Si, and S/Si elemental results from the NEAR XRS experiment at 433 Eros.

---

**MERCURY**


MESSENGER Science Observation Planning for Orbital Operations at Mercury [#1862]
MESSENGER science observations in Mercury orbit require coordination between all investigations. The SciBox suite of software tools enable year-long mission simulations yielding detailed science commanding and is used to ensure completion of all mission objectives.

Braden S. E.  Robinson M. S.  Murchie S. L.  Seelos F. P.

Preliminary MDIS-WAC Scattered Light Correction [#2394]
We describe a preliminary wavelength-dependent correction for the dominant component of Mercury Dual Imaging System Wide Angle Camera scattered light using an empirically derived model of the point spread function for each filter.


Detector Temperature Dependence for MESSENGER Surface Reflectance Measurements and Implications for Mercury Surface Science [#2391]
We present a temperature-based detector response variation refinement of the MESSENGER MASCS spectrometer calibration in a critical wavelength range for mineralogical and compositional interpretation of Mercury’s surface.
Moldovan R.  Johnson C. L.  Ritzer J. A.  Purucker M. E.  Solomon S. C.  Anderson B. J.
Denevi B. W.  Korth H.
Detecting Crustal Magnetic Fields on Mercury with MESSENGER [2481]
We investigate conditions under which crustal remanent magnetization can produce magnetic fields detectable by the MESSENGER spacecraft from orbit around Mercury.

Herrick R. R.  Curran L. L.  Baer A. T.
A Mariner/MESSENGER Global Catalog of Mercurian Craters [1706]
Initial results from a global compilation of impact craters on Mercury with D > 10 km.

Bauch K. E.  Hiesinger H.  Helbert J.
Insolation and Resulting Surface Temperatures of Study Regions on Mercury [2257]
The imaging spectrometer MERTIS is part of the payload of ESA’s BepiColombo mission, scheduled for launch in 2014. In preparation of the MERTIS experiment, we performed detailed thermal models of the lunar surface, which we extrapolated to Mercury.

Riner M. A.  Lucey P. G.
The Abundance of Space Weathering Derived Submicroscopic Metal on Mercury: Constraints from MESSENGER MDIS Multispectral Images [1309]
Using MESSENGER multispectral images, we apply a new space weathering model to explore the cause of Mercury’s low albedo. We show that space weathering-derived submicroscopic metal particles are larger and more abundant on Mercury than on the Moon.

Brown S. M.  Elkins-Tanton L. T.
An Experimental Approach to Thermal and Solar Weathering of Mercury’s Crust [2050]
We present experiments that simulate space weathering on Mercury by irradiating and heating likely mercurian crustal minerals. We analyze our experiments compositionally, structurally, and spectrally and we discuss implications for the exosphere.

Molaro J. L.  Byrne S.
Thermal Stress Weathering on Mercury and Other Airless Bodies [1494]
We will discuss the implications of thermal stress weathering on bodies lacking atmospheres, and a relative sense of efficacy and importance of this process for various inner-solar-system bodies.

Lawrence D. J.  Harmon J. K.  Feldman W. C.  Paige D. A.  Peplowski P. N.  Rhodes E. A.  Selby C. M.  Solomon S. C.
Predictions of MESSENGER Neutron Spectrometer Measurements for Mercury’s Polar Regions [1955]
Using Earth-based radar and MESSENGER flyby data, we present predicted neutron counting rates for three Mercury polar water ice scenarios. Statistically significant signals should be detected for high abundances of hydrogen (>50 wt.% H2O equiv.).

Kameda S.  Kagitani M.  Okano S.
Source Process of Exospheric Sodium on Mercury and Temporal Variability of Sodium Density [1654]
The source process of exospheric sodium atoms is still unclear though many observations have been done since its discovery. In this paper, we show the past results of ground-based observations and discuss its source process.

---

**THERMAL AND MAGMATIC EVOLUTION OF THE MOON**

Audet P.  Johnson C. L.
Lithospheric Structure of the Moon and Correlation with Deep Moonquake Source Regions [1742]
We investigate relationships between deep moonquake source regions and lithospheric and crustal structure from a wavelet analysis of gravity and topography.
Huang Q.   Wieczorek M. A.  
*Constraints of the Density and Porosity of the Lunar Highlands Crust from Gravity and Topography* [#1879]
In order to estimate the bulk density of the upper crust, localized spectral analysis has been applied to several highland regions on the Moon. Combined with pore-free density from geochemistry, porosity of the upper crust is implied to be 2–3%.

Fuller M.   Weiss B. P.  
*The Paleomagnetic Record of the Apollo Breccias* [#1945]
The paleomagnetism of the breccias is reviewed and the strength of a lunar dynamo prior to the mare formation is assessed.

Schmerr N. C.   Matzel E.   Ford S. R.  
*The Effect of Free-Surface Topography on Seismic Waves in the Moon* [#1961]
We forward model the effects of surface topography on seismic wave propagation in the Moon. Our models constrain the nature of scattering in the lunar crust and will guide future missions deploying seismic instrumentation on the Moon.

Laneuville M.   Wieczorek M. A.  
*The Heat Flow of the Moon: Influence of Long Term Orbital Signals* [#2296]
In this project, we investigate the influence of the modulation of the annual thermal wave’s amplitude by the 18.6 year precession of the lunar nodes on the heat flow estimate.

O’Sullivan K. M.   Neal C. R.   Simonetti A.  
*Investigating the Lunar Magma Ocean Hypothesis with Anorthosite 15415 and Troctolite 76535* [#2570]
We explore the lunar magma ocean hypothesis using lunar highland samples 15415 and 76535.

Tronche E. J.   van Westrenen W.  
*The Lunar Magma Ocean: An Experimental Solidification Study* [#1415]
We experimentally solidified the lunar magma ocean, following an equilibrium crystallization in a first 50% step and *in situ* crystallization for the 10 other 5%. The cumulate pile and the residual liquids are different than from previous studies.

Elardo S. M.   Shearer C. K. Jr.   Burger P. V.  
*A Petrologic Comparison of Isotopically Distinct Lunar Low-Ti Basaltic Meteorites NWA 032 and LAP 02205* [#2582]
Lunar meteorites NWA 032 and LAP 02205 share many compositional and mineralogical similarities, yet are isotopically distinct. We present the preliminary findings of a petrologic comparison of these basalts to investigate a possible relationship.

Wang Y.   Hsu W.   Guan Y.  
*Petrology and Geochemistry of the Lunar Basaltic Meteorite Northwest Africa 4734* [#1593]
Petrology, mineralogy, and rare earth element geochemistry of the lunar basaltic meteorite Northwest Africa (NWA) 4734 are reported here. NWA 4734 has high affinities to LaPaz Icefield 02205 and had experienced late-stage assimilation processes with KREEP-rich materials.

Neal C. R.   Donohue P.   Fagan A.   Hui H.   O’Sullivan K.  
*Using Quantitative Petrography to Distinguish Between Pristine Basalts and Impact Melts from the Moon* [#2668]
Crystal size distributions of plagioclase are used to distinguish between pristine basalts and basaltic impact melts.
Fagan A. L.  Neal C. R.  Simonetti A.  
Distinguishing Between Apollo 14 High-Alumina Basalts and Olivine Vitrophyres: Textural and Chemical Analyses of Olivines [2149]  
We use chemical and textural analyses of olivines to distinguish between the Apollo 14 impact melt-generated olivine vitrophyres and the pristine, High-Alumina mare basalts.

Hui H.  Oshrin J. G.  Neal C. R.  
Investigation into the Petrogeneses of Apollo 14 High-Alumina Basaltic Melts Through Crystal Stratigraphy [1461]  
We investigate the petrogenetic processes of Apollo 14 high-Al basaltic melts using compositions of plagioclase crystals.

Nagaoka H.  Karouji Y.  Takeda H.  Fagan T. J.  Ebihara M.  Hasebe N.  
Co-Existing Pyroxenes in the Northwest Africa 2977 with Reference to the Source Region [1864]  
Lunar meteorite Northwest Africa 2977 includes two lithologies. Lithology (1) is similar to a slowly-cooled mare basalt. Lithology (2) is an intrusive rock crystallized more rapidly than Mg-suite rocks.

Snape J. F.  Beaumont S.  Burgess R.  Crawford I. A.  Joy K. H.  
An Evaluation of Techniques Used in the Age and Petrologic Analysis of Apollo 12 basalts [2011]  
We have analyzed the petrology and age of three well-studied Apollo 12 basaltic samples. Comparison of our data with that of previous studies indicates a broad agreement between our techniques and those of other researchers.

Lindsay F. N.  Herzog G. F.  Albarède F.  Korotev R. L.  
Elemental and Isotopic Abundances of Fe, Cu and Zn in Low- Ti basalts [1907]  
Cu and/or Zn isotope abundances in 3 low-Ti lunar basalts are comparable with values reported for high-Ti basalts. δ^{66}Zn and δ^{65}Cu correlate weakly at best, hinting at the presence of distinct components within the basalts.

Donohue P. H.  Neal C. R.  
Textural Analyses of Apollo 17 High-Titanium Basalts Using Crystal Size Distributions [2568]  
This study investigates the petrogenesis of all classified Apollo 17 high-titanium basalts (Types A, B1, B2, C, and D) through the use of crystal size distributions for ilmenite, plagioclase, and armalcolite.

Vander Kaaden K. E.  Agee C. B.  van Kan Parker M.  
The Effect of Titanium on Lunar Magma Compressibility at High Pressure [1295]  
The lunar volcanic glasses range in TiO$_2$ content from 0.26–16.4 wt%, with this study focusing on the Apollo 17 “orange glass,” which has 9.1 wt% TiO$_2$. The goal is to determine the role of TiO$_2$ on lunar volcanic glass density at elevated P-T.

Nekvasil H.  McCubbin F. M.  Ustunisik G.  
Magmatic Degassing in Planetary Bodies: What Apatite can Tell Us [2240]  
Apatite has the potential to retain information on degassing of water, Cl, and F. Lunar apatite records a history of early dehydration followed by loss of a brine during second boiling.

Ustunisik G.  Nekvasil H.  Lindsley D. H.  
Exploring the Effect of Cl, F, H$_2$O, and S During Experimental Degassing of Lunar Magmas [2643]  
Degassing experiments were conducted at <1 bar on synthentic Apollo sample 14053 with Cl, F, H$_2$O, and S. After six hours, much of the water, S, and halogens were lost, causing significant changes in relative melt and apatite volatile contents.

FE-SEM, FIB and TEM Study of Surface Deposits on Apollo 15 Green Glass Volcanic Spherules [2203]  
Surface deposits on lunar pyroclastic glass spherules have been characterized using HRTEM. These deposits are dominated by Zn and S, but also include Mg and exhibit a rather complex stratigraphic.
Gaddis L. R. Klem S. Gustafson J. O. III Hawke B. R. Giguere T. A.
Alphonsus Dark-Halo Craters: Identification of Additional Volcanic Vents [#2691]
This study presents evidence for at least two previously unrecognized vents in the floor of Alphonsus Crater. Results suggest that many such features and associated pyroclastic deposits are likely to be identified with the wealth of new lunar remote sensing data.

Chauhan P. Kaur P. Srivastava N. Bhattacharya S. Lal D. Ajai Kiran Kumar A. S.
Studies of Lunar Dark Halo Craters in North Western Mare Nectaris Using High Resolution Chandrayaan-1 Data [#1338]
In this study, we present the results from remote sensing data of very high resolution (both spatial and spectral) for localized dark mantle deposits (LDMD) around crater Beaumont-L in the northwestern part of Mare Nectaris from Chandrayaan-1.

Small Crater Densities Near Apollo 17: Clues to Properties of Lunar Pyroclastic Deposits [#2584]
New crater density data show a deficiency of small craters on pyroclastic mantled soils. New high-resolution remote sensing data and automated crater counting allow us to examine the viability of using small crater populations to identify lunar pyroclastic deposits.

Gustafson J. O. Bell J. F. III Gaddis L. R. Hawke B. R. Giguere T. A. LROC Science Team
A Search for Potential Newly Identified Lunar Pyroclastic Deposits with LROC Data [#2434]
New LRO camera (LROC) data are facilitating the search for lunar pyroclastic deposits not previously catalogued. Examples of potential newly identified pyroclastic deposits are presented.

Western Oceanus Procellarum as Seen by C1XS on Chandrayaan-1 [#1684]
We present lunar XRF data from C1XS for a ground track through Oceanus Procellarum as MgO/SiO$_2$ and Al$_2$O$_3$/SiO$_2$ ratios, which are compared to existing remotely sensed data from Lunar Prospector and lunar sample lithology compositions.

Chauhan P. Srivastava N. Kaur P. Bhattacharya S. Ajai Kiran Kumar A. S. Goswami J. N. Navalgund R. R.
Evidences of Multiphase Modification over the Central Peak of Tycho Crater on Moon from High Resolution Remote Sensing Data [#1341]
Results of an integrated analysis of the central peak of Tycho from TMC data onboard Chandrayaan-1, NAC images of LROC, and Multi-band Imager (MI) data from SELENE are presented to understand processes involved in multiphase modifications of the central peak of Tycho.

Arya A. S. Thangjam G. Rajasekhar R. P. Ajai Gopala Krishna B. Amitabh
Kiran Kumar A. S. Navalgund R. R.
Morphometric and Rheological Analysis of an Effusive Dome in Marius Hills Using Chandrayaan-1 TMC Data [#1470]
This abstract summarizes the morphometric and rheological analysis of a dome in Marius Hills, Oceanus Procellarum.

Carter L. M. Campbell B. A. Hawke B. R. Bussey D. B. J.
A Radar Survey of Lunar Dome Fields [#1937]
Lunar domes have differing radar backscatter characteristics that may provide clues to their formation and evolution. We present initial results from a survey that includes the Marius Hills, Cauchy dome field, and domes near Hortensius and Vitruvius.

Hansteen Alpha: A Silicic Volcanic Construct on the Moon [#1652]
LROC images, LRO Diviner data, and Clementine UVVIS images were used to investigate Hansteen α, a Th-rich, silicic volcanic construct that was emplaced during the late Imbrian epoch.

Tran T.  Robinson M. S.  Lawrence S. J.  Braden S. E.  Plescia J.  Hawke B. R.  Jolliff B. L.  Stopar J. D.  LROC Team

Morphometry of Lunar Volcanic Domes from LROC [#2228]
We investigated the morphometry and morphology of Gruithuisen, Mairan, Compton-Belkovich, Hortensius, Rümker Hills, and Marius Hills domes using Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Camera (NAC) derived digital terrain models (DTMs).

Trang D.  Gillis-Davis J. J.  Hawke B. R.  Bussey D. B. J.
The Origin of Lunar Concentric Craters [#1698]
Remote sensing data were used to study the origin of lunar concentric craters. Various processes were investigated to find the most probable mechanism. Results indicate igneous intrusion is the likely candidate for the origin of concentric craters.

The Spectral Properties of Ina: New Observations from the Moon Mineralogy Mapper [#2499]
M^3 observations of Ina are consistent with the presence of freshly exposed high-Ti basalts within the structure’s blocky floor materials. These results support previous interpretations that portions of Ina’s floor are relatively young.

Size Frequency Distributions of Blocks on Lunar Volcanic Landforms: Results from LROC [#2422]
We present the results from a comprehensive effort to obtain detailed size-frequency distributions for blocks associated with volcanic landforms by digitizing blocks from LROC NAC images and discuss implications for understanding the geology of the Marius Hills region.

New Methods for Discovery and Characterization of Lunar Lava Tubes Using Lunar Reconnaissance Orbiter Data [#1424]
We describe how Lunar Reconnaissance Orbiter instrumentation can be used to discover and more accurately study lunar lava tubes.

---

**COMPOSITION AND STRUCTURE OF THE LUNAR CRUST: SAMPLES**

Serefiddin F.  Ma P.  Herzog G. F.  Reedy R. C.  Knie K.  Rugel G.  Faestermann T.  Korschinek G.
Al-26, Be-10, and Mn-53 in Six Lunar Meteorites [#1392]
We construct cosmic-ray exposure (CRE) histories of six lunar meteorites. All six Moon-Earth transit times are <2 Ma. The preservation of SCR effects may reflect low arrival velocities.

Macke R. J.  Kiefer W. S.  Britt D. T.  Irving A. J.  Consolmagno G. J.
Densities, Porosities and Magnetic Susceptibilities of Meteoritic Lunar Samples: Early Results [#1986]
We will report the current results of an ongoing survey of density, porosity and magnetic susceptibility of lunar materials. Our database of measurements has recently expanded by 24 meteorites, of which 16 have porosities.
Sedio S. M.  Jolliff B. L.  Korotev R. L.  Zeigler R. A.
_Fragments of Granite in Apollo 12 Regolith: Pieces of 12013?_ [5281]
We compare the petrography, mineralogy, bulk composition, and likely petrogenesis of the granitic component of lunar breccia 12013 with lunar granite 12032,366-19, whose differences imply formation by different processes.

Liu Y.  Patchen A.  Taylor L. A.
Lunar Highland Breccias MIL 090034/36/70/75: A Significant KREEP Component [5261]
Study of new lunar highland breccias MIL 090034/36/70/75.

Simon J. I.  Shih C.-Y.  Nyquist L. E.
_K-Ca and Rb-Sr Dating of Lunar Granite 14321 Revisited_ [52754]
K-Ca and Rb-Sr ages were improved for Apollo lunar granite clast 14321. The initial Ca isotopic ratio can be used to constrain the K/Ca ratio (~0.7) of its source material. This value is significantly higher, thus more evolved, than previous thought.

Vaughan W. M.  Wittmann A.  Joy K. H.  Lapen T. J.  Kring D. A.
Provenance of Impact Melt and Granulite Clasts in Lunar Meteorite PCA 02007 [52124]
EMP and LA ICP-MS analyses of impact melt and granulite clasts in the lunar meteorite PCA 02007 reveal clues to their provenance in KREEP-poor regions of the Moon dominated by feldspathic lithologies.

Braun S. A.  Brandon A. D.  Joy K. H.  Kring D. A.
_Did Meteorite Bombardment Sample Deep Lunar Crust?: Major and Trace Element Compositions of Granulite Clasts in Lunar Regolith Breccia MAC 88104_ [522762]
This work seeks to determine the depth of formation of granulite clasts in MAC 88104 through major and trace element analysis. Preliminary results suggest that the source of these granulites is mixed and may represent sourcing from mid to shallow crustal depths.

Spicuzza M. J.  Valley J. W.  Kitajima K.  Ushikubo T.
_Oxygen Isotope Ratios and Trace Element Concentrations in Zircons from Lunar Rocks and Regolith_ [522445]
High-precision SIMS analyses of $\delta^{18}$O values in zircons from lunar rocks and regolith show a very narrow range. Correlations between [Ti] and other trace elements in lunar zircons reflect magmatic evolution and fractionation of phosphates.

Carpenter P.  Edmunson J.  Cohen B. A.  Zeigler R. A.  Jolliff B. L.
First Lunar Occurrence of Keiviite-(Y) in Troctolitic Anorthosite 76335 [522767]
We report the first lunar occurrence of keiviite-(Y) with formula (Y,REE)$_2$Si$_2$O$_7$ in troctolitic anorthosite 76335,59. It has been characterized by EPMA utilizing new analytical methods.

Tanosaki T.  Miura Y.
Mafic, Calcium and Carbon Contents of the Lunar Plagioclases of the Apollo Samples and Lunar Meteorites [522817]
Compositional data of lunar plagioclases show that impact breccias have high Ca exchange contents with high carbon contents. In fact, _in situ_ analyses of the two lunar meteorites with the FE-ASEM show significant carbon with calcium or iron elements.

Chakrabarti R.  Jacobsen S. B.
_The Isotopic Composition of Magnesium in Bulk Lunar Soils_ [522006]
We present Mg isotopic data in 14 lunar soil samples from the Apollo 14 and Apollo 16 missions using MC-ICPMS. Mg-isotopic compositions of these soils are broadly similar to that of lunar basalts and breccia, the bulk silicate Earth, and chondrites.
COMPOSITION AND STRUCTURE OF THE LUNAR CRUST: REMOTE SENSING

Robinson M. S., Denevi B. W., Sato H., Hapke B., Hawke B. R.
LROC WAC Ultraviolet Reflectance of the Moon [1842]
Overview of ultraviolet to visible (320 nm to 689 nm) color differences on the Moon from LROC WAC multispectral imaging.

Denevi B. W., Robinson M. S., Sato H., McEwen A. S., Hapke B. W.
LROC WAC Ultraviolet Characterization of Lunar Space Weathering [2304]
The effects of space weathering in the UV are examined using global WAC data. 321/415-nm ratios show increased maturity causes a decrease in UV slope, and a large fraction of the surface defined as immature based on OMAT is mature in this index.

Hapke B., Denevi B., Sato H., Robinson M.
The Opposition Effect of the Moon as Seen by the Lunar Reconnaissance Orbiter Wide Angle Camera [1080]
We measured the lunar opposition effect between 320 and 690 nm. Both shadow hiding and coherent backscatter contribute. No dependence on wavelength was seen, contrary to theory. Our understanding of the coherent backscatter opposition effect is incomplete.

Sato H., Denevi B. W., Robinson M. S., Hapke B. W., McEwen A. S., LROC Science Operation Team
Photometric Normalization of LROC WAC Global Color Mosaic [1974]
In order to find the best photometric normalization, we tested 1) seven fitting functions, 2) source image filtering, and 3) a new photometric normalization scheme called “tile-by-tile method”.

Besse S., Boardman J., Nettles J., Staid M., Sunshine J. M., Li J.-Y., Yokota Y., Buratti B., Hicks M., Pieters C., M3 Team
Deriving a Photometric Model for the Moon Mineralogy Mapper Data (M3) [1773]
We present results of the photometric model derived for the Moon Mineralogy Mapper (M3) data using a Lambert component and the full set of M3 data. The phase function is similar to previous studies, however, we noticed a relatively flat phase function at large phase angles.

Grumpe A., Brinkmeier F., Wöhler C.
Analysis of Topographic Effects Observed in Spectral Features Extracted from Chandrayaan-I M3 Imagery [1484]
In this abstract we present an approach to determine the effects of surface topography on spectral features. The presented regression algorithm indicates a strong correlation of anomalies in extracted spectral features and the corresponding terrain.

Thompson D. R., Gilmore M., Mandrake L., Castaño R., Bue B.
Automatic Detection of Water and Mafics in M3 Radiance Images [2397]
An automated search for spectral anomalies in Moon Mineralogy Mapper (M3) radiance data detects water (OH/H2O) and mafic absorption features in Ryder Crater. It corroborates the significance of the ~3 µm water signal in the scene’s spectral diversity.

Analysis of Schrodinger Basin Using Moon Mineralogy Mapper Spectra [1545]
We present our first efforts to characterize Schrodinger’s basin floor, peak ring, and basin rim materials using new spectral data from the Moon Mineralogy Mapper.

Moriarty D. P. III, Pieters C. M., Nettles J., Isaacson P. J., Cheek L., Head J. W., Tompkins S., Petro N.
Finsen and Alder: A Compositional Study of Lunar Central Peak Craters in the South Pole-Aitken Basin [2564]
We use Moon Mineralogy Mapper data to explore the mineralogy of Finsen and Alder, two central peak craters in the South Pole-Aitken Basin.
Yamamoto A.
Remote Sensing Data Analysis for the Menelaus Region of the Moon [1780]
We use Kaguya Multiband Imager data for geologic analysis of the Menelaus region on the moon. Clustering classification method is used for analysis and distribution of interesting geologic features is shown in this report.

Bugiolacchi R. Mall U. Bhatt M.
NIR Spectral Investigation of the Delisle/Diophantus Crater Region by the SIR-2 Instrument [1843]
The Delisle/Diophantus craters are located around Mare Imbrium’s alleged submerged western outer rim. These similarly-aged impacts excavated materials with different spectral characteristics, suggesting chemically distinct targets.

Bhatt M. Mall U. Bugiolacchi R. Lehmann B.
Study of Spectral Characteristics of the Central Peak Region of Tycho Crater Using the SIR-2 Data On-Board Chandrayaan-1 [2390]
We present the results of spectral characteristics of the central peak region of Tycho Crater using the SIR-2 data onboard Chandrayaan-1. The study goal is the systematic investigation of the observable variations of the bidirectional reflectance.

Whitten J. L. Head J. W. Pieters C. M. Mustard J. F. M³ Team
Maunder and Kopff Craters: Windows into the Upper Lunar Crust [2168]
Maunder and Kopff are larger craters that have impacted into Orientale Basin and excavated further into the lunar crust. Investigating their compositions using M³ data can reveal important information about upper-crustal stratigraphy on the Moon.

Cahill J. T. S. Patterson G. W. Turtle E. P. Bussey D. B. J.
An Analysis of Orientale Basin: Integration of Mini-RF Radar and Optical Mapping Products [2134]
An analysis of Orientale Basin using Mini-RF radar and optical mapping products.

Hagerty J. J. Lawrence D. J. Gillis-Davis J. J. Cahill J. T. S. Klima R.
Analyses of Lunar Prospector and Clementine global iron maps indicate there are significant differences between these data sets for specific portions of the lunar surface. Here we address possible reasons for these differences.

Crites S. T. Englert P. Riner M. A. Lucey P. G.
New Estimates of the Global Distribution of Titanium, Rare Earths, Thorium/Samarium Ratio and Mg-Number from Integrating Lunar Prospector Neutron and Gamma Ray Spectrometer and Clementine Mineral Maps [1343]
We produce refined Ti and Sm plus Gd distribution estimates from Lunar Prospector data by validating major-element distributions with fast neutron data, and using Clementine mineral maps to estimate distributions of elements not measured by LP GRS.

Prospects for Deriving Lunar Elemental Maps by Inelastic Scattering Gamma Rays [2093]
Elemental distributions of Ca, Al, and Mg on the Moon were investigated using low-altitude Kaguya (SELENE) Gamma-Ray Spectrometer data with a focus on inelastic-scattering gamma rays.
Factors Influencing Lunar Surface Analysis Using X-Ray Fluorescence Spectrography [#1819]
We describe investigations into factors affecting lunar surface analysis through XRF, including crater rays and atmospheric volatiles. These studies apply to all planetary XRF measurements, but are from the perspective of the C1XS instrument.

SAMPLES AND SPECTROSCOPY: INSIGHTS INTO THE LUNAR CRUST

Mapping Titanium Abundance Using Chang'E-1 IIM Data [#1807]
The derivation of the preliminary algorithm for TiO2 mapping using Chang’E-1 IIM data were presented in this abstract. A regional case study near MS2 region is also performed in comparisons with corresponding Clementine TiO2 mapping.

Wu Y. Z.  Gan F. P.  Yan B. K.  Tang Z. S.
Global Distribution of FeO and TiO2 as Derived from Chang ‘E-1 IIM data [#1223]
The global maps of Fe and Ti were derived with CE-1 data. Our maps suggest that (1) Fe and Ti are exponentially related; (2) the histogram of Fe is unimodal and that of Ti is continuous; (3) the Fe of the highest area is very low, and the materials are perhaps not from SPA.

Kong W. G.  Jolliff B. L.  Wang A.
Ti Distribution in Grain-Size Fractions of Apollo Soils 10084 and 71501 [#1641]
Grain-size fractions of lunar soils 10084 and 71501 were studied using X-ray digital image analysis. We report results for mineral and lithologic modal analysis, shape analysis of ilmenite grains, and Ti distribution analysis.

Reflectance Spectroscopy of Ilmenite: New Constraints from Apollo Sample Measurements [#2130]
New laboratory measurements of lunar basalt samples provide important new data on the VNIR spectral reflectance properties of ilmenite-rich materials. These data provide key constraints for evaluating ilmenite abundance with remote sensing.

Peel S. E.  Dyar M. D.  Klima R. L.
Crystal Structure Parameters as Predictors of VNIR Spectroscopy of Synthetic Pyroxenes [#1394]
We demonstrate relationships between steric parameters of the pyroxene structure and the positions of bands at 1.0, 1.2, and 2 μm in the near-infrared.

Klima R. L.  Dyar M. D.  Peel S. E.
Spectral Modeling and Crystallographic Properties of Al-Rich Pyroxenes [#2181]
We integrate crystallographic and NIR spectroscopic measurements of Al-rich pyroxenes to quantify the effect of Al on pyroxene spectra. These results will expand the foundation for remote compositional analyses of extraterrestrial pyroxenes.

Sugita S.  Nagata K.  Tsuboi N.  Hiroi T.  Okada M.
A New Modified Gaussian Model (MGM) Using a Bayesian Estimation Approach: Toward Automated Analysis of Planetary Spectra [#2624]
A new modified Gaussian model (MGM) that determines the optimum number of Gaussians and has little dependence on initial parameter selection is proposed, enabling automated analyses of currently available large volume of lunar reflectance spectra.
Li L.  Li S.
Deriving Lunar Mineral Abundance with Hyperspectral Reflectance Data [#2565]
GA-PLS models are derived from the LSCC dataset and these models can be directly applied to mapping of lunar mineral abundances with the hyperspectral M3 images.

Dhingra D.  Mustard J. F.  Wiseman S.  Pariente M.  Pieters C. M.  Isaacson P. J.
Non-Linear Spectral Un-Mixing Using Hapke Modeling: Application to Remotely Acquired M3 Spectra of Spinel Bearing Lithologies on the Moon [#2431]
This study reports initial results from nonlinear spectral unmixing of remotely acquired spectra of Mg-spinel-bearing lithologies on the Moon using Hapke’s radiative transfer modeling.

Gamma-Ray Spectral Unmixing of Compositional End-Members: A Fresh Look at Lunar Geochemistry [#2731]
A mixing model is used to analyze Lunar Prospector nuclear spectroscopy data. The global lunar composition is represented by four end members. Remotely-sensed compositions, under-represented in the sample collection, are consistent with the model.

Thermal Infrared Emissivity Measurements in a Simulated Lunar Environment of the Major Silicate Minerals on the Moon [#1927]
We characterize the TIR spectral changes between ambient and SLE for minerals on the Moon and evaluate their application for remote sensing. Our new measurements demonstrate the sensitivity of minerals to environmental conditions under which they are measured.

Cheek L. C.  Pieters C. M.  Parman S. W.  Dyar M. D.  Speicher E. A.  Cooper R. F.
Reflectance spectra of synthetic plagioclases show a well-resolved increase in absorption band depth for samples with <0.4 wt% FeO, suggesting that small differences in the compositions of highland plagioclases should be distinguishable remotely.

---

**MOON: APOLLO-LUNOKHOD LEGACY**

Abdrakhimov A. M.  Basilevsky A. T.  Head J. W.  Robinson M. S.
Luna 17/Lunokhod 1 and Luna 21/Lunokhod 2 Landing Sites as Seen by the Lunokhod and LRO Cameras [#2220]
The Soviet Lunokhod rover traverses were recognized by identifying traces on high-resolution LROC images. From the LROC image data, preliminary cumulative crater densities were measured for mare and highland areas traversed by Lunokhod.

Williams D. R.  Hills H. K.  Guinness E. A.  Lowman P. D.  Taylor P. T.
PDS Lunar Data Node: Restoration of Apollo Surface and Orbital Data [#2286]
We describe the recovery, restoration, and archive of Apollo orbital and surface data and ancillary information through the PDS Lunar Data Node and other related efforts.

Dawson M. D.  Todd N. S.  Lofgren G. E.
Apollo Lunar Sample Integration into Google Moon: A New Approach to Digitization [#1783]
The Google Moon Apollo Lunar Sample Data Integration project enhances the Apollo mission data available on Google Moon and provides an interactive research and learning tool for the Apollo lunar rock sample collection.
Garcia P. A.  Todd N. S.  Lofgren G. E.  Stefanov W. L.  Runco S. K.  Labasse D.  Gaddis L. R.  
*Restoration and PDS Archive of Apollo Lunar Rock Sample Data [#2310]*
Scientists at the Johnson Space Center Lunar Sample Lab and Image Science and Analysis Lab are working with Planetary Data System Imaging Node personnel to archive digitized versions of the original film negatives of the Apollo lunar rock samples.

Lofgren G. E.  Todd N. S.  Runco S. K.  Stefanov W. L.  
*Apollo Lunar Sample Photographs: Digitizing the Moon Rock Collection [#1867]*
JSC curation is digitizing pictures of lunar samples taken during initial sample return and subsequent processing. These images will be available via a searchable database on the Curation website as they are produced; 69% are currently available.

Chi P. J.  Russell C. T.  Williams D. R.  Hills H. K.  
*Restoration of Apollo Magnetic Field Data: Accomplishments and Outstanding Issues [#2444]*
We have successfully restored all Apollo Subsatellite Biaxial Magnetometer data and samples of Lunar Surface Magnetometer data available at NSSDC. More work is needed to recover the LSM and SBM data archived at the Federal Records Center.

Nagihara S.  Nakamura Y.  Lewis L. R.  Williams D. R.  Chi P.  Schmidt G. K.  
*Search and Recovery Efforts for the ALSEP Data Tapes [#1103]*
This presentation describes the search and recovery efforts for the raw data tapes of the ALSEP instruments by members of the NLSI ALSEP Data Recovery Focus Group.

Lewis L. R.  Nakamura Y.  Nagihara S.  Williams D. R.  Chi P.  Taylor P. T.  Schmidt G. K.  Grayzeck E. J.  
*NLSI Focus Group on Missing ALSEP Data Recovery: Progress and Plans [#1620]*
Most of the ALSEP experiments raw data and about 50 percent of its processed data are not in the GSFC NSSDC archives. A group of mainly volunteers has made significant progress in locating missing data records and data over the last year.

Kim T.  Moratto Z. M.  Nefian A. V.  Ly S.  Demonceaux C.  Fofi D.  
*Robust Orbital Refinement of the Apollo Trajectory Data for the Ames Stereo Pipeline [#2680]*
Camera positions of the Apollo trajectory data have a large error that throws off the Ames Stereo Pipeline (ASP). An energy-based method is proposed to estimate the orbital trajectory of Apollo satellites and provide an initial estimate to the ASP.

Moratto Z.  Nefian A.  Kim T.  Broxton M.  Beyer R.  Fong T.  
*Stereo Reconstruction from Apollo 15 and 16 Metric Camera [#2267]*
We have produced digital terrain models and image mosaics that cover the nearside of the Moon at 40 m/px and 10 m/px respectively. These are produced from 2600 images from the Metric Camera aboard Apollo 15 and 16 missions processed by the Ames Stereo Pipeline.

Petro N. E.  Bleacher J. E.  Gaddis L. R.  Garry W. B.  Mest S. C.  Abercromby A. F.  Gernhardt M. L.  
*Digitization and Reanalysis of Apollo Surface Traverses [#2032]*
Apollo surface activities are the best documented events in history. The astronauts’ work and the samples and measurements they collected have shaped our understanding of the Moon. We are digitizing and georeferencing data from all Apollo traverses.

Wingo D. R.  Byrne C. J.  
*Analysis of Lunar Orbiter Images Recovered from Analog Tape [#2085]*
The analysis of Lunar Orbiter images derived from magnetic tapes have been analyzed to determine whether or not the original data can be processed in a means superior to reprocessing the existing film-based data.
Byrne C. J.  Crotts A. P. S.  
*Restoration of Very High Resolution Lunar Orbiter Images [#2204]*
A set of 66 images from Lunar Orbiter mission 5 (1967) have been built from film framelets that were digitized by USGS/Astrogeology. These 1 m resolution images can be compared with those from current missions to show changes over 40 years.

Epps A. D.  Sandler M.  
*Recovering Lunar Orbiter Framelets from Digitized Magnetic Tape Record [#2416]*  
Discusses the process by which the magnetic tapes from Lunar Orbiter are digitized and processed in order to create framelets that are superior to those available from the film record.

---

**EDUCATION AND PUBLIC OUTREACH: MOON**

Bleacher L. V.  Petro N.  Bleacher J. E.  Santiago D.  Noble S.  
*Next Generation Lunar Scientists and Engineers: Developing the Future Work Force for a Sustainable Lunar Science and Exploration Program [#1408]*
The NGLSE provides experience-building and networking opportunities between its members and the established lunar science and engineering communities. We report on the needs of the NGLSE and a series of workshops and events to meet those needs.

Shaner A. J.  Shipp S.  Allen J.  Kring D. A.  
*Educating the Next Generation of Lunar Scientists [#2794]*
The Center for Lunar Science and Exploration’s High School Lunar Research Project immerses high school students in lunar science and the process of scientific research. Students are also exposed to pathways into scientific careers.

Gibson E. K.  Schwenzer S. P.  
*The Open University-NASA Apollo Virtual Microscope — A Tool for Education and Outreach [#1799]*
An on-line virtual microscope allows students free access to pan and zoom around lunar thin sections, and investigate lunar petrology from anywhere they have internet access.

Allen J.  Luckey M.  McInturff B.  Kascak A.  Tobola K.  Galindo C.  Allen C.  
*Solar System Samples for Research, Education, and Public Outreach [#2426]*
JSC curates all NASA’s extraterrestrial samples, which includes documentation, preservation, preparation, and distribution of samples for research, education, and outreach. Displays, sample disks, and thin sections are available for domestic loan.

Daou D.  Day B. H.  
*The NASA Lunar Science Institute Education and Pubic Outreach Program [#1548]*
We look at how the NLSI EPO program has been a major element in preparing the next generation of scientists and in sharing with the public the excitement of discoveries we make when we explore the Moon.

---

**IMPACTS I: MODELING AND EXPERIMENTS**

Arkani-Hamed J.  
*Could Giant Impacts Cripple Core Dynamos of Small Terrestrial Planets? [#1532]*
The impacts that have created the largest basins Utopia, Caloris, and Aitken on Mars, Mercury, and the Moon, respectively, could have thermally stratified their cores, suppressed their core convection, and crippled their thermally driven core dynamos for ~17, 4 , and 5 Ma.
Genda H.  Kokubo E.  Ida S.

*Giant Impacts and Terrestrial Planet Formation [2090]*

We develop the hybrid code for the long-term orbital evolutions of objects (N-body code) and the short-term collision processes of objects (SPH code). Here, we apply this hybrid code to the giant impact stage of terrestrial planet formation.

Crawford D. A.

*CTH Simulations of Candidate Moon Forming Impacts [2112]*

CTH simulations of candidate Moon forming impacts are presented. Agreement and differences with other numerical methods will be discussed. Convergence trends with increasing numerical resolution are studied.

Holsapple K. A.

*On the Flow and Fluidization of Granular Materials: Applications to Large Lunar Craters, Cliff Collapses and Asteroid Shapes [2612]*

About flows of granular materials and assumptions about fluidization mechanisms to explain large flat craters and landslide run outs. No such mechanisms are needed, the reasons and examples are given.

Housen K. R.  Holsapple K. A.

*Momentum Transfer in Hypervelocity Collisions [2363]*

Momentum transfer in collisions is important for processes such as collisional evolution of asteroid spin states and mitigation of potentially hazardous objects. Experiments are described that measure the momentum imparted by the projectile and ejecta.

Yasui M.  Arakawa M.

*Impact Experiments of Gypsum-Glass Beads Mixtures Simulating Parent Bodies of Ordinary Chondrites [1131]*

We conducted impact experiments of porous gypsum-glass beads mixtures simulating the parent bodies of ordinary chondrites to examine the effect of glass beads on the impact strength. We found that the impact strength changed with the glass bead size and the impact velocity.

Arakawa M.  Dohi K.  Okamoto C.  Hasegawa S.

*Experimental Study on Impact Craters Formed on Basalt Target Covered with Weak Mortar Layer [1186]*

High-velocity impact experiments on layered targets were conducted to investigate the formation mechanism of tiny complex craters with the size less than 1 km found on the Moon. Then the crater morphology was found to change with the upper layer thickness.

Wada K.  Barnouin O. S.

*Investigating the Formation of Ramparts at Fluidized Ejecta on Mars Using a Granular Flow Model [1726]*

We carry out numerical granular flow simulation, using distinct element method, to investigate the conditions of ejecta flow that might produce fluidized or layered ejecta at martian craters.

Barnouin O. S.  Ernst C. M.  Wada K.

*Experimental Investigation of Ejecta Emplacement on Mars [1475]*

We present new laboratory data on ejecta emplacement using the JHU/APL ejecta simulator (EEsim). The EEsim is a large apparatus, capable of throwing sheets of debris with velocity and mass distributions analogous to ejecta from impacts.

Stickle A. M.  Schultz P. H.

*Substrate Effects from Oblique Hypervelocity Impacts into Layered Targets [2698]*

We experimentally and numerically examine effects of low-impedance layers on subsurface target damage. Oblique impacts into targets with low-impedance surface layers exhibit reduced peak pressures, subsurface damage, and crater size in the substrate.
Poelchau M. H. Deutsch A. Kenkmann T. Hoerth T. Schäfer F. Thoma K. MEMIN Team
Experimental Impact Cratering into Sandstone: A MEMIN-Progress Report [#1824]
The MEMIN Project is currently focused on impact experiments into sandstone. First results are presented here, including the evaluation of high-speed cameras, ejecta catchment devices, crater morphology, and chemical projectile-target interaction.

Poelchau M. H. Dufresne A. Kenkmann T.
Impacts into Sandstone: Crater Morphology, Crater Scaling and the Effects of Porosity [#1838]
Crater morphology results from impact cratering experiments in sandstone within the MEMIN program are presented and compared to other brittle materials. The effects of porosity on crater shape, volume and cratering efficiency are analyzed.

Schmitt R. T. Reimold W. U. Hornemann U.
Low Shock Pressure Recovery Experiments with Dry Sandstone Samples Within the MEMIN Research Program [#1075]
Within the MEMIN program shock recovery experiments with Seeberger sandstone were carried out in the pressure range of 5 to 12.5 GPa to investigate shock effects in quartz and the influence of porosity on progressive shock metamorphism.

Price M. C. Burchell M. J. Cole M. J.
The Influence of Target Temperature on Crater Morphometry: Experiments and Hydrocode Modelling [#2328]
Experimental data on the effect of target temperature on impact crater formation is sparse. Experimental data are presented detailing crater morphology changes as a function of target temperature in the range 118–500 K.

Kurosawa K. Sugita S.
Pressure Measurements of Self-Luminous Rock Vapors Using Atomic Line Broadening [#1714]
We present a new pressure measurement method for high-temperature rock vapor plumes using spectral line broadening. This method may serve as a powerful tool for the understanding of post-impact chemistry.

Ernst C. M. Barnouin O. S. Schultz P. H.
Role of Projectile Failure on the Impact Flash [#2299]
The evolution of the impact flash provides a means to examine early-time impact processes. We present a suite of experiments to investigate the effects of impact velocity and projectile failure on the resulting flash.

Melosh H. J. Ong L.
Is High-Speed Ejection of Meteorites by Spallation Impossible? [#2354]
DeCarli has strenuously argued that spallation cannot eject lightly shocked meteorites at high speed. We show that such ejection, while forbidden by the Hugoniot relations, is permitted by the more comprehensive Navier-Stokes equations.

Ivanov B. A. Pierazzo E.
Ice-Rock Mixture Hugoniot: Numerical Modeling [#2185]
We present a detailed analysis of shock wave propagation in an ice-rock mixture (permafrost) that was recently investigated experimentally.

Bell M. S. Zolensky M. E.
Experimental Shock Transformation of Gypsum to Anhydrite: A New Low Pressure Regime Shock Indicator [#2008]
Raman analyses have been used to verify the experimental shock transformation of gypsum to anhydrite. These shock-induced effects in gypsum can provide a new low-pressure regime shock indicator for impact deposits lacking quartz or other crystalline rock-forming minerals.
Daly T. Kerby J. Austin D. E.

Electrospray Charging of Minerals: A New Method for Creating and Characterizing High- to Hyper-Velocity Microparticle Impacts [#2078]
We are developing a new method for creating high-velocity microparticle impacts in the lab that allows minerals, mineral-ice mixtures, and ices to be used as projectiles and directly characterizes the chemical speciation occurring during impact.

Reiser F. Dufresne A. Poelchau M. H. Deutsch A. Kenkmann T.

Catching as much Information as Possible — An Efficient and Easy-to-Build Ejecta Catcher for High-Velocity Impact Experiments [#1733]
A custom designed ejecta catcher has been developed and successfully utilized for gentle capture of experimentally produced impact ejecta. The used materials enable the acquisition of numerous information on the ejection process. Preliminary results are presented.

Pierazzo E. Garcia R. R. Kinnison D. E. Marsh D. R. Mills M. J.

Atmospheric Ozone Perturbation from Oceanic Impacts of Medium-Size Asteroids [#1501]
We investigate the effects of oceanic impacts of mid-sized asteroids on the lower and middle atmosphere chemistry. We find that maximum ozone perturbation occurs for equatorial impacts, causing strong high-latitude ozone depletion in both hemispheres.

Artemieva N. Morgan J.

Global Ejecta from Chicxulub: Spherules, Shocked Quartz and More [#1180]
We model the Chicxulub ejecta starting from the crater formation and up to the final deposition of the finest ejecta around the globe. At distances larger than 1000 km interaction of ejecta with the atmosphere plays an important role.

Wünnemann K. Kühn H. Janle P. Kenkmann T.

The Waqf as Suwwan Impact Crater, Jordan: Numerical Modeling of Crater Formation and Gravity Data [#1700]
Combined modeling of crater formation and gravity data at the well-preserved 6-km complex Waqf as Suwwan impact crater, Jordan, provide insight of the subsurface deformation and brittle fracture.

Vasconcelos M. A. R. Wünnemann K. Crósta A. P. Reimold W. U.

Numerical Modelling of Serra da Cangalha Impact Structure: Preliminary Analysis [#1046]
The Serra da Cangalha is a Brasilian complex impact structure that is ~13 km in diameter. We used here the iSALE code in order to obtain a two-dimensional model that reproduces the geological information available assuming two different layers in the model.

**Impacts II: Terrestrial Craters**

Watt N. Bouchet R. Lee C.-T. A.

Exploration of Tektite Formation Processes Through Water and Metal Content Measurements [#1109]
To better explore the effects of impacts on surface materials, we measured the compositions of tektites from Vietnam. While zinc/lead ratios were linearly correlated, there was no correlation between water content and zinc or lead contents.

Craig M. A. Osinski G. R. Flemming R. L. Cloutis E. A.

Spectral Identification of Impact Glasses Via NIR Reflectance Spectroscopy [#2411]
Impact glasses from Haughton and other known impact sites possess what appears to be a unique NIR spectral feature that may be indicative of their impact origin. As such, it is possible that impact glasses may be identified via the use of reflectance spectroscopy alone.
Osinski G. R.  Tornabene L. L.  Grieve R. A. F.
*Impact Ejecta Emplacement on Terrestrial Planets* [1866]
Current models of ejecta emplacement do not account for several important observations of planetary ejecta deposits; in particular, the presence of double or multiple layers of ejecta. Here, we present a new working model in which ejecta is emplaced in a multi-stage process.

*Quantitative Digital Image Analysis of Impact Melt-Bearing Breccias (“Suevites”)* [2164]
Preliminary quantitative digital image analysis of ‘suevites’ with minimal manual intervention. Parameters including modal abundances of ‘suevite’ components were measured after particles of interest were segmented and analyzed using ImageJ software.

Mader M. M.  Osinski G. R.  Marion C. L.
*Impact Ejecta at the Mistastin Lake Impact Structure, Labrador, Canada* [2505]
We recently identified impact ejecta deposits in the rim region of the Mistastin Lake impact structure, including impact glass-bearing polymict breccias and impact melt. A possible multistage impact ejecta emplacement model is discussed.

Gaither T. A.  Hagerty J. J.  Clark S. E.  Hare T. M.  Hayward R. K.  Newson H. E.  Wright S. P.  McHone J.
*Multi-Dimensional Characterization of Impact Ejecta Deposits from Meteor Crater, AZ* [1474]
Using the USGS Meteor Crater drill core sample suite, we are investigating the three-dimensional distribution and compositions of impact melts, metallic spherules, and meteoritic fragments with known lateral and vertical context within the ejecta.

Kring D. A.  Balcerski J.  Blair D. M.  Chojnacki M.  Donohue P. H.  Drummond S. A.  Garber J. M.
*Asymmetrical Distribution of Impact Ejected Lithologies at Barringer Meteorite Crater (a.k.a Meteor Crater)* [1746]
Eighty meters of ejected material was sheared from the rim of Meteor Crater and deposited at greater distances, which explains the asymmetry of ejecta around the crater.

Roy S.  Stewart R. R.  Kring D. A.
*Seismic Investigations at Barringer Crater, Arizona* [1644]
A high-resolution seismic investigation of the shallow subsurface of the Barringer Crater, Arizona has been presented. Different layers have been identified based on the velocity variations.

Dulin S. A.  Elmore R. D.  Dennie D. P.  Evans S. C.  Mulvany P.
*Paleomagnetic Investigations of the Decaturville, MO, and Sierra Madera, TX, Impact Structures* [1120]
In this study we are testing if a modified paleomagnetic conglomerate test on impact breccias, in conjunction with geochemical/petrographic studies, can be used to constrain the timing of the impacts and determine the origin of carbonate breccias.

Melero Asensio I.  Martín-Hernández F.  Ormø J.
*Rock-Magnetic Properties of Drill Core LOC-9 from the Lockne Crater, Sweden* [1463]
This study provides a precise analysis of the rock magnetic properties, including characterization of the magnetic phases and identification of them for samples from the LOC-9 core from the Lockne impact crater, Sweden.
Melero Asensio I., Ormö J., Sturkell E.

Preliminary Geophysical Survey of the Målingen Structure, Sweden [1542]

Geophysical results are obtained in order to develop a geophysical modeling of the Målingen structure and will be used to constrain numerical simulation to evaluate the potential impact origin and its relation with the Lockne impact crater.

Ormö J., Sturkell E., Melero Asensio I., Frisk À., Lepinette A., Moro Martin A.

The Målingen Structure: A Probable Doublet to the Lockne Marine-Target Impact Crater, Central Sweden [1048]

Lockne/Målingen are likely the first documented doublet marine-target craters and their various sizes with respect to the same target water depth offers a unique chance to study the effects of target water depth on the cratering process.


Wetumpka Impact Structure (Alabama) — A Gravity Model [2732]

This project utilizes high-resolution gravity data to explore the subsurface geology and structure of the Wetumpka impact structure. Gravity modeling shows that simple geologic layering cannot explain the observed gravity lows near the impact site.

King D. T. Jr., Ormö J., Petruny L. W., Harris R. S., Johnson R. C., Markin J. K., Neathery T. L., Tabares Rodenas P.

Shallow Subsurface Stratigraphy of Wetumpka Impact Structure, Alabama (USA) [2335]

This abstract examines the results of shallow core-hole drilling from 1998 to 2009, including data from eight wells. Lithologic logs from the eight wells are presented and interpreted in this presentation.

Petruny L. W., King D. T. Jr., Harris R. S.

Wetumpka’s Baillif Hill Stratigraphic Section — Mixed Crystalline and Sedimentary Megablocks and Impact Breccia [2406]

The section at Baillif Hill in the intrastructure terrain of the Wetumpka impact structure contains a sequence of impact breccias and mixed sedimentary and crystalline megablocks. These deposits were previously known only from depths of <100 m near the crater center.

Markin J. K., King D. T. Jr., Ormö J.

Wetumpka Resurge Chalk Deposits — Insights from X-Ray Computed Tomography [2579]

The Wetumpka impact structure is a marine target impact feature with resurge chalk deposits. CT analysis of 25 m of resurge chalk drill core shows many previously unrecognized sedimentary structures reflecting resurge processes.

Herrmann B. C., Mayne R. G.

Impact At Ingalls? Evidence for Subsurface Ordovician Meteorite Impact Near Ingalls, OK [1032]

An Ordovician-aged structural anomaly in the subsurface of north-central Oklahoma has been suggested as having an impact origin. The claim will be investigated using well logs and rock cuttings from wells drilled into the structure.

Schmieder M., Buchner E., Reimold W. U.

Impact-Related Deformation Features in Cherts from Terrestrial Impact Structures [2274]

A preliminary review of impact-induced and potentially impact-related microdeformation features in cherts from a number of sedimentary-hosted terrestrial impact structures (Jebel Waqf as Suwwan, Steinheim, Kentland, and Crooked Creek) is presented.

Ferrière L., Lubala F. R. T., Osinski G. R., Kaseti P. K.

The Luizi Structure (Democratic Republic of Congo) — First Confirmed Meteorite Impact Crater in Central Africa [1637]

Our detailed analysis of the Luizi structure, combining a remote sensing study with geological field observations and petrographic examination of rock samples collected during our 2010 field campaign allows us to confirm its meteorite impact origin.
Milam K. A.  Aden D. J.  Kah L. C.
*Geochemical Analyses of the Tawaz Breccia, an Anomalous Mesoproterozoic Breccia in West Africa [#2784]*
The Tawaz breccia is an anomalous Mesoproterozoic breccia in West Africa that represents a tsunamiite, potentially generated by an impact event.

Milam K. A.
*A Revised Diameter for the Serpent Mound Impact Crater in Southern Ohio [#2797]*
The Serpent Mound impact crater in southern Ohio is <14 km in diameter based on new analyses.

Beal R. A.  Newsom H. E.  Wright S. P.  Misra S.
*Discovery of Mantled Sub-Millimeter Lapilli from the Lonar Crater, India [#1509]*
Lapilli in Lonar ejecta have rims of fine-grained basaltic minerals and scoriacious melt particles. Accretionary lapilli cores consist of coarser-grain particles while armored lapilli have cores of basalt, shocked basalt, and impact melt spherules.

Arif Md.  Deenadayalan K.  Basavaiah N.  Misra S.
*Variation of Primary Magnetization of Basaltic Target Rocks due to Asteroid Impact: Example from Lonar Crater, India [#1383]*
The abstract reports the variation of primary magnetization component at Lonar crater, India with regard to the direction of impact through the comparison of shocked and unshocked basalts collected from around the crater rim and at ~2 km east-southeast of the crater rim.

Carli C.  Pittarello L.  Capaccioni F.
*VNIR Spectroscopic Measurements of Samples from Basaltic Impact Crater Rocks [#1119]*
Impact cratering is an important geological process affecting the morphology, the petrography, and mineralogy of the original surface. We report a preliminary VNIR spectra characterization and interpretation of impact crater basaltic samples.

Misra S.  Newsom H. E.
*Incompatible Trace Element Fractionation in Impact-Melts of Lonar Crater, India — Evidence of Differential Impact Melting of Target Deccan Basalt [#1060]*
Incompatible trace element analyses of impact-melt bombs from Lonar crater, India, show that these melts were generated by plagioclase-dominated partial melting of target Deccan basalt.

Misra S.  Andreoli M. A. G.  Gibson R. L.  Wela S.
*Petrographic Observations of Shock Deformation Between ~18 and 20 km Radius in the Morokweng Impact Structure, South Africa [#1102]*
In the present study we have reported our detailed petrographic observations on the type of shocked deformations on two boreholes drilled at ~18–20 km distance to the southwest and northwest of the center of the Morokweng impact crater, South Africa.

Anders D.  Kegler P.  Buchner E.  Schmieder M.
*Carbonate Melt Lithologies from the Steinheim Impact Crater (SW Germany) [#1997]*
Studies of samples from the Steinheim impact structure, Germany, yielded smaller amounts of carbonate melts, either as calcite patches within the Steinheim suevite melt particles, or as dolomitic melt veins injected into host limestone fractures.

Sturm S.  Willmes M.  Hiesinger H.  Kenkmann T.  Pösges G.
*Megablocks in the Ries Impact Crater, Germany: New Discoveries and Statistical Analysis of Distribution and Lithologies [#1705]*
A comprehensive map of the megablock zone of the Ries crater in Germany was created by means of remote sensing and shallow drilling, and the distribution of the megablocks in relation to the crater center and crater rim was determined.
Muttik N. Kirsimäe K. Newsom H. E. Williams L. B.  
*Boron Isotope Composition of Smectite in Suevites at the Ries Crater, Germany [#2413]*  
This study represents preliminary $\delta^{11}$B data of smectite minerals in crater fill and surficial suevites from the Ries Crater, Germany, to determine the temperature and fluid composition during initial phyllosilicate formation in suevites.

*Rare Earth and Trace Element Geochemistry of Impact Melts from the Gardnos Impact Structure, Norway [#2589]*  
This study consists of trace-element geochemical analysis of individual melt clasts from suevite breccias and of melt-breccia dikes.

Troiano J. Ebel D. S. Friedrich J. M. Landman N. H. Boesenborg J. S. Bigolski J. N.  
*Iridium Anomaly in the Ivanhoe Creek Section New Jersey Coastal Plain K/Pg Boundary [#2733]*  
We report on the position of the Cretaceous/Paleogene (K/Pg) Ir anomaly in a trench section from the Ivanhoe Creek area of Monmouth County, New Jersey.

Koeberl C. Pittarello L. Brigham-Grette J. Melles M. Minyuk P. El’gygytgyn Science Team  
*El’gygytgyn, an Impact Crater in Siliceous Volcanic Rocks: Preliminary Classification of the ICDP Drill Core [#1510]*  
The complex impact crater El’gygytgyn was recently drilled to yield a 200-m-long drill core into shocked and brecciated volcanic rocks.

Boctor N. Koeberl C. Steele A. Hemley R. J. Armstrong J.  
*Accessory Minerals in Shocked Rocks from the El’gygytgyn Impact Structure, Russia [#1892]*  
We present initial results on samples from the El’gygytgyn impact structure.

Wittmann A. Goderis S. Claeys P.  
*Preliminary Petrography of Impactites from El’gygytgyn Crater, NE Siberia, Including Cores from ICDP-Lake Drilling Hole D1 [#2792]*  
Comparison of glassy melt bombs near the crater rim with impactites from a drilling near the central uplift of El’gygytgyn crater indicate a melt deficiency in this impact structure.

Thomson O. A. Cavosie A. J. Radovan H. A. Moser D. E.  
*First Report of Detrital Shocked Zircons from the Paleoproterozoic Sudbury Impact Structure, Ontario Canada [#2217]*  
We report the first occurrence of detrital shocked zircons in North America, eroded from the giant Sudbury impact structure.

López C. Cavosie A. J. Radovan H. A. Moser D. E. Byerly G. Lowe D.  
*A Search for Shocked Zircons in Impact Horizons from the Barberton Greenstone Belt, South Africa [#2236]*  
Zircons from three spherule-bearing impact ejecta layers from Barberton, South Africa, were investigated for the presence of impact shock microstructures.

*Geochronology of Detrital Shocked Zircons in a Pleistocene (ca. 1.6 Ma) Fluvial Deposit 500 km Downriver from the Vredefort Dome, South Africa [#2247]*  
Here we present U-Th-Pb age determinations for detrital shocked zircons found in Pleistocene (ca. 1.6 Ma) fluvial terrace deposits near Windsortorn South Africa, 500 km downriver from the Vredefort Dome.
Huber M. S.  Ferriere L.  Losiak A.  Koeberl C.
ANIE: A Mathematical Algorithm for Automated Indexing of Planar Deformation Features in Shocked Quartz [#1200]
A mathematical method of indexing planar deformation features in quartz and a Microsoft Excel macro for automated indexing is presented, allowing for more rapid and accurate results than the previously used manual method.

Losiak A.  Ferrière L.  Koeberl C.
What is the Role of Alpha-Quartz in Impact Shock Metamorphism? Angles Between Pole Orientations of Planar Deformation Features as a Proxy for the Shock-Induced Temperature Change [#1284]
We present preliminary results of a study on the variation of combinations of PDF orientations in quartz grains. PDF orientations within the studied samples reflect the symmetry of α-quartz, but it appears as if some quartz grains were of α-quartz type when the PDFs formed.

Losiak A.  Wojciechowski J.  Ferrière L.  Huber M.  Koeberl C.
A Web-Based Program for Indexing Planar Deformation Features in Quartz [#1286]
Here, we present a web-based program for indexing PDFs that also allows for analysis of azimuthal angles between PDFs in a given quartz grain.

Goto K.  Nakano Y.  Matsui T.  Tada R.  Tajika E.
Abundance, Grain Size and PDF Orientations of Shocked Quartz Grains Around the Chicxulub Crater [#1571]
We measured abundance, grain size, and PDF orientations of shocked quartz grains around the Chicxulub Crater in order to investigate the distribution and variation of shocked quartz grains produced by the Chicxulub impact.

Kuriyama Y.  Nakamura N.  Muto J.  Nagase T.  Pati J. K.
‘Ballen Quartz’ from the Dhala Impact Structure and its Crystal Orientation Pattern by Electron Back Scattered Diffraction (EBSD) [#1657]
We present the first crystallographic orientation analysis of ballen quartz from the Dhala impact structure by an electron back-scattered diffraction (EBSD).

Varga T. N.  Gucsik A.  Bérczi Sz.  Nagy Sz.  Veres M.  Varga T. P.
Micro-Raman Properties of Quartz in Suevite Breccia from Ries Impact Crater, Germany [#2150]
The purpose of this study is to determine the possible shock pressures observable in the suevite found in the Ries Crater by micro-Raman spectroscopy, and by comparison with previous studies, thus utilizing the method of shock barometry.

Das P. K.  Misra S.  Newsom H. E.  Sisodia M. S.
Possible Planer Fractures, Coesite, and Accretionary Lapilli from Ramgarh Structure, India: New Evidence Suggesting an Impact Origin of the Crater [#1294]
The new findings of PF in quartzs in sandstone from the rim of the structure, along with accretionary lapilli from soil inside the structure, and the presence of coesite in these lapilli, suggest that Ramgarh is an impact crater.

Kattenhorn S. A.  Daly R. G.
Impacts into Salt Basins: The Role of Salt Mobilization in Crater Modification and Deformation [#2803]
Impacts into target materials containing a mobile layer such as salt may result in post-impact crater modification by diapirism. We advocate this process occurred at Upheaval Dome, Utah.
Dorsey R. J.  Greeley R.
*Distinguishing Endogenic and Impact Craters Using Depth to Diameter Ratios and Circularities* [#2722]
Based on concerns for surface age dating, morphometric data from the McCartys Flow, New Mexico, was compared to craters in the Colombia Hills area in Gusev Crater, Mars, to distinguish impact craters from volcanic craters in lava flows.

---

**MATERIALS ANALOGS: LIVING IN A MATERIAL WORLD**

Arivazhagan S.  Anbazhagan S.
*Comparison of Lunar Analog Rock Spectra with Clementine Data* [#1009]
The analysis presented here is comparison of lunar multispectral data with analog rock spectra convolved to Clementine spectra.

Clegg R. N.  Metzger P. T.  Huff S.  Roberson L. B.
*Lunar Soil Erosion Physics for Landing Rockets on the Moon* [#1450]
For future lunar operations, the low ejection angle and high velocity of blowing lunar soil particles by rocket exhaust are concerns for instruments deployed on the Moon and for the historic Apollo sites.

Blewett D. T.  Denevi B. W.  Lawrence S. J.  Coman E. I.
*Spectra of Lunar Glass Simulants: New Old Data for Reflectance Modeling* [#1044]
We have recovered reflectance spectra for 20 synthetic lunar glasses studied by E. N. Wells that were not previously widely available. These data greatly expand the range of Fe and Ti compositions for use in spectral modeling.

*Thermal Desorption Properties of Water Adsorbed on Micronized Lunar Surrogates JSC-1A and Albite* [#2189]
Temperature program desorption experiments of water adsorbed on micronized lunar regolith surrogates JSC-1A and albite.

Glotch T. D.  Wright S. P.  McKeebay B. E.  Ferrari M. J.
*Micro-FTIR and Micro-Raman Spectroscopy of Shocked Basalts from Lonar Crater, India* [#1566]
We present micro-FTIR and micro-Raman maps and spectra of class 2 shocked basalts from Lonar Crater, India.

Rask J. C.  McCrossin C.  Loftus D. J.
*Chemical Reactivity in Mechanically Ground Quartz Relevant to Impact Processes* [#2704]
To understand how impact processes may affect the chemical reactivity and toxicity of regolith and dust, we have tested a variety of mechanical grinding methods for quartz and other planetary analog materials.

Newsom H. E.  Wright S. P.  Misra S.  Muttik N.  Beal R. A.
*Role of Impact Craters in the Origin of Phyllosilicates and Surficial Materials on Mars — New Understanding from Earth Analog Studies* [#1298]
Recent analog research shows how impacts produce — hydrothermal clay precipitates, mobile element enrichments in sediments, shocked basalt, formation of accretionary lapilli, and airburst heating of the surface — and all can be studied by Mars rovers.

*Investigation of Mars Clay Analogs by Remote Laser Induced Breakdown Spectroscopy (LIBS)* [#1851]
Our goal in this study was to evaluate the operation of Laser Induced Breakdown Spectroscopy (LIBS), as carried on the ChemCam instrument for MSL, against a range of phyllosilicates to define operational parameters and possibilities for characterization.
In order to reply to the exobiological goals of the 2018 MAX-C/ExoMars mission, the Orléans-OSUC analogue rock collection and database contains well characterised Mars analogue rocks and minerals for use in instrument testing and \textit{in situ} missions.

To aid in interpreting data from far-IR missions, we are collecting mass absorption coefficient spectra in the wavelength range 15 to 250 µm of micrometer-sized powders for terrestrial analogs of astrophysically relevant minerals, represented by various mineral groups.

Raman peaks shifts and narrowing have been monitored as a function of temperature for Mars relevant minerals to help the sample identification and characterization that will be made by a flight laser Raman spectrometer during the ExoMars mission.

In this work there’s a first approach analysis to Calatrava’s volcanic field as a Mars analog. Raman spectroscopy, XRD and Mössbauer spectroscopy were used for the analysis.

Mineral dissolution experiments require well-characterized mineral material that is relatively free of contaminates and is available in sufficient quantities. Here we report progress synthesizing chlorapatite and whitlockite for use in dissolution experiments.

We measured the bidirectional reflectance distribution function of a sample with a spectral absorption feature to characterize how the band depth varied with lighting and viewing geometry.

We demonstrate that the diffraction removal procedure outlined by Hapke et al. [Icarus, 199, 210 (2009)] contains an error. By following their intended scheme we found that the Hapke model is not anisotropic enough to describe the reflectance patterns.

\textbf{MARS ROVERS AND LANDERS}

We use CRISM spectrophotometric observations to derive surface single-scattering albedos and phase functions near Opportunity by modeling atmospheric and surface scattering and absorption via Discrete Ordinate Radiative Transfer and the Hapke model.
Testable Hypotheses for Opportunity’s Traverse from Santa Maria to the Rim of Endeavour Crater [2199]
The purpose of this abstract is to present working hypotheses to help guide the acquisition and analysis of continued MRO coverage and Opportunity observations as the rover departs Santa Maria, traverses across the plains, and ascends Endeavour’s rim.

Mars Exploration Rover Opportunity Terramechanics Across Ripple Covered Bedrock in Meridiani Planum [1503]
This abstract summarizes Opportunity’s drives since leaving Victoria crater, issues associated with high slippage and sinkage during traverses, and soil and terrain properties retrieved from modeling the drives and the wheel-soil interactions.

Recent Athena Microscopic Imager Results [2282]
Recent results of the Microscopic Imager investigation on the Mars exploration rovers “Spirit” and “Opportunity” will be presented.

Grain Shape Analysis of Sand- and Silt-Size Sediments at the Phoenix Mars Lander Site from Images Acquired by the Phoenix Optical Microscope [1516]
Differences in grain roundness between Phoenix samples suggest differences in grain accumulation, abrasion, fracturing, or aggregation in the trough adjacent to the periglacial polygon relative to the other periglacial geomorphic settings examined.

Rocks and Rock Size-Frequency Distributions at the Mars Science Laboratory Landing Sites [1547]
Improvements to the rock-counting software that segments shadows in HiRISE images and correctly predicted the distributions later found by the Phoenix lander have been made and results at the four Mars Science Laboratory landing sites are presented.

Wall-to-Wall 1-m Topographic Coverage of the Mars Science Laboratory Candidate Landing Sites [2407]
Nearly complete 1 m/post-topographic models of the MSL landing ellipses contain more height points than the MOLA global dataset, supporting site safety validation, rover traverse planning, and assessment of the accuracy of HiRISE stereo mapping.

Experimental Eolian Erosion of Soft Sedimentary Rocks with a Variety of Abrasives — Observed Features and Potential Applications for Mars Rover Geology [2176]
Soft sediments (shales and evaporites) were wind-abraded with various media to study resulting surface textures for use in future rover missions. Shales/mudstones differentiate from evaporite rocks, details of sedimentary features are revealed.
MARS: LARGE VOLCANOS AND LAVA FLOWS

Beddingfield C. B.  Burr D. M.
Formation and Evolution of Surface and Subsurface Structures Within the Large Caldera of Olympus Mons, Mars [2386]
Mapping of tectonic features in Olympus Mons’ largest caldera provides data for comparison to results from published physical experiments. From this basis, we deduce a depth for the magma chamber and a scenario of caldera evolution.

Musiol S.  Williams D. A.  van Gasselt S.  Platz T.  Dunke A.  Neukum G.
Investigation of a Landslide Mechanism for the Formation of the Olympus Mons Scarp and Aureole Lobes [1932]
Olympus Mons scarp and aureole lobes are investigated with methods of mapping, terrain model analysis and morphometry. Results suggest a landslide mechanism.

Crown D. A.  Ramsey M. S.  Berman D. C.
Lava Flow Fields of Southern Tharsis, Mars: Mapping, Morphologic, and Chronologic Studies [2352]
Mapping of lava flows fields in the southern Arsia Mons and Daedalia Planum regions of Mars combined with analyses of flow morphology and populations of small impact craters are used to document the styles, magnitudes, and ages of volcanic in southern Tharsis.

Evidence of Hydrothermal Activity at Apollinaris Patera, Mars [1966]
Our research corroborates the Viking-era investigations that point to Apollinaris Patera, Mars as a site of high potential for magmatic/hydrothermal activity. Here we list our key findings.

El Maarry M. R.  Heggy E.  Dohm J. M.
Assessment of a Possible Volcanic Paleolake at Apollinaris Patera, Mars: Constraints on the Composition of the Inner Caldera and Fan Deposits Using the Shallow Sounding Radar (SHARAD) [2027]
We explore the hypothesis that a volcanic paleolake existed in the caldera of Apollinaris Patera, Mars, and has been responsible for the formation of extensive fan deposits draping the volcano’s southern flank using data from the shallow sounding radar SHARAD.

Morgan G. A.  Campbell B. A.  Carter L. M.  Plaut J. J.
Investigating the Stratigraphy and Three Dimensional Structure of the Youngest Lava Flows on Mars Using the SHARAD Radar [2629]
We have followed up previous SHARAD studies of Elysium Planitia by conducting a focused investigation of the eastern portion of the region. We will present the spatial distribution of multiple subsurface reflectors located below the lava flows.

Gwinner K.  Head J. W.  Wilson L.  Fassett C.  Dissmore S.
Surface Ages of the Volcanic Deposits of Pavonis Mons and Implications for the Magma Supply of Tharsis [2466]
Episodic activity linking deposition on flanks, calderas, and adjacent plains in a repetitive pattern, compatible with other findings on timescales of magma supply, is documented for >0.5 Ga, implying a primary center for magma ascent up to the present.
**MARTIAN LAYERED DEPOSITS**

Bishop J. L.  Weitz C. M.
*Morphology and Mineralogy of Light-Toned Layered Deposits on the Juventae Chasma Plateau and the Location of a Proposed Future Landing Site [#2115]*

LLD on the Juventae Chasma plateau contain opaline silica and hydroxylated ferric sulfate. Landing here would enable characterization of this enigmatic and uniquely martian sulfate material that is inaccessible to rovers elsewhere on the planet.

Hill K. S.  Bridges J. C.  Smith K. B.  Tragheim D. G.  Davies S. J.
*What was the Role of Water in ILD Formation on Mars?: Insights from New CRISM Techniques [#2082]*

We hypothesise that ILD sediments are analogous to NPLD, which suggests a climatic control dominated by orbital forcing. A statistical analysis of the spectral variance of CRISM has shown a lack of hydrated minerals over ILD features in Arabia Terra.

Fueten F.  Harvey R.  Stesky R.  Hauber E.  Rossi A.
*Layer Thickness Determination of Interior Layered Deposits, with Particular Emphasis on Candor Mensa, Mars [#1255]*

Candor Mensa consists of two distinct layer thickness-based units; a lower unit with layers ~4 m to 10 m and an upper unit with layers <1 m to 6 m thick. Continuity of layers and the lack of unconformities suggest a stable depositional environment.

Lucchitta B. K.
*West Candor Chasma, Mars. What is New? [#1490]*

Geologic mapping showed many stratigraphic discontinuities but major unconformities are scarce. Interbedded resistant dark layers could be volcanic. Curvilinear reentrants on Ceti Mensa may be caused by gravitational failure combined with erosion.

Grindrod P. M.  West M.
*Aqueous Mineralogy Recorded in Coprates Catena, Mars [#1290]*

We combine HiRISE and CTX DTMs with CRISM data to determine the stratigraphy and mineralogy of an area of light-toned deposits within a closed trough of Coprates Catena.

Chapman M. G.  Neukum G.  Dumke A.  Michael G.  Kneissl T.
*Dark Material on Valles Marineris Plateaus: A Preliminary Report [#2423]*

This abstract suggests that the dark materials about Valles Marineris plateau are local, weathered outcrop remnants of *in situ*, lithified dark-toned layered rocks that erode to form aeolian deposits.

Le Deit L.  Hauber E.  Fueten F.  Pondrelli M.  Zegers T.  van Gasselt S.  Massé M.  Verpoorter C.  ISSI ILD Team
*Geological Comparison of the Gale Crater Mound to Other Equatorial Layered Deposits (ELDs) on Mars [#1857]*

The Gale Crater Mound is composed of fine-grained, indurated and easily erodible material as many other layered deposits located in the equatorial region of Mars. The geological study of the Gale mound may provide clues on the origin of all ELDs.

**MARS: TERRESTRIAL ANALOGS**

*Preliminary Results on Lava Flow Morphologies and Vent Structures: An Example from the Western Volcanic Zone, Iceland [#2108]*

Lava flow morphologies and morphometries are studied to derive rheological flow properties.
Hauber E.  Platz T.  Le Deit L.  Chevrel O.  Hoffmann B.  Kuhlmann L.  Trauthan F.  Preusker F.  Jaumann R.
Mapping of Postglacial Icelandic Lava Flows as Analogues for Mars [1749]
Photogeologic mapping of an Icelandic lava flow, based on airborne HRSC images and topographic data, is complemented by field observations. The results help to interpret the mapping results of martian lava flows, i.e., flow emplacement and rheology.

Zimbelman J. R.  Garry W. B.  Bleacher J. E.  Crumpler L. S.
The 1859 Mauna Loa pahoehoe flow includes many classic features related to flow inflation. Two field excursions documented several inflation features as aids to evaluating their detectability on planetary lava flows.

Possible Freeze and Thaw Landforms on High Latitude Slopes on Mars: Insights from Terrestrial Analogs in Spitsbergen, Svalbard [2758]
We use solifluction lobes in Svalbard as analogs to high-latitude lobate landforms on Mars. We investigate a freeze-and-thaw origin and aim to constrain formation processes.

Allred K.  Luo W.  Konen M.
Elongation Analysis from Prevailing Winds of Glacial Landforms in Northern Illinois [1168]
This study examines the relationship between the orientation of ice walled-lake plains and the prevailing wind direction. It offers a potential terrestrial analog for understanding the morphology and processes of glacial landforms on Mars.

Moscardelli L.  Wood L.
Erosional Shadow Remnants as Terrestrial Analogs for Teardrop-Shaped Islands on Mars: Implications for Outflow Channel Formation [1005]
This work proposes that teardrop-shaped islands located on the outflow channels of Mars might have been formed as the result of catastrophic submarine mass movements similar to those documented within continental margins on Earth.

ElSenousy A.  Gavin P.  Chevier V.  Sayyed M. R. G.  Islam R.
Thermal Alteration of Deccan Paleosols, India: A Correlation with Martian Phyllosilicates Using Fourier Transform Infrared Spectroscopy [2770]
The purpose of this study is to heat the Deccan soils under atmospheric conditions of Mars to determine paleotemperature.

Kienlenberger R. L.  Greeley R.
Distribution of Windblown Sediment in Small Craters on Mars: Preliminary Field Analog Studies at Amboy Crater, California [1053]
We present the results of field wind measurements and assessments of sediment deposition in small, shallow craters.

---

**CRYOSPHERE: Icy Insights into Mars Paleoclimate**

Baker D. M. H.  Head J. W.  Marchant D. R.
New Evidence for Regional Glacial Modification of Plains Units in Deuteronilus Mensae, Mars [1422]
New observations of ice-rich lobate debris aprons and an adjacent plains unit in Deuteronilus Mensae, Mars, including similar crater retention ages and complex marginal textures, suggest modification of the plains unit by regional glaciation.
Kadish S. J.  Head J. W.
*Preservation of Layered Paleodeposits in High-Latitude Pedestal Craters on Mars* [#1003]
High-latitude pedestal craters, including one on the south polar layered deposits, that have exposed layers along their marginal scarps offer supporting evidence that the process by which pedestals form involves impacts into ice-rich paleodeposits.

Orgel Cs.
*Analysis of Cryokarstic Surface Patterns on Debris Aprons at the Mid-Latitudes of Mars* [#1305]
This work focuses on the morphological analysis of the surface patterns (mounds, furrows, craters) and surface types (smooth surface, corn-like surface, polygonal mantling material, brain-like texture) on debris apron surfaces using HiRISE’s images.

Quartini E.  Holt J. W.  Brothers T. C.
*Internal Structure of a Lobate Debris Apron Complex in Eastern Hellas: Evidence for Multiple Mid-Latitude Glaciations on Mars* [#2470]
The past depositional history of a lobate debris apron complex in eastern Hellas has been investigated by conducting a combined analysis of its surface morphology and subsurface structure using a CTX mosaic and orbital radar sounding data from SHARAD.

Brothers T. C.  Holt J. W.
*SHARAD Investigations of Possible Links Between Erosion of Mars’ Planum Boreum Basal Unit and Nearby Sedimentary Deposits* [#2669]
SHARAD basal unit (BU) investigations have uncovered a multitude of features previously hidden. This study is an investigation of BU reentrants in effort to understand their relation to circumpolar deposits.

Christian S.  Holt J. W.
*Frequency Analysis of SHARAD Reflectors Within the North Polar Layered Deposits, Mars and Implications for the Link Between Radar and Optical Data* [#2628]
Frequency analyses of SHARAD amplitude data have been conducted in order to compare common wavelengths with results of albedo frequency analyses and optical and radar statistical properties.

*Modeling SHARAD Echoes from HiRISE-Derived Stratigraphy of the Northern Polar Layered Deposits of Mars* [#2552]
We apply HiRISE-derived stratigraphy to propagation models and investigate plausible compositions of ice and dust. Initial results show reflections to have similar spacing (~30 m) as the separation of visual maker beds.

Russell P. S.  Byrne S.  Mattson S.  Christian S.  Holt J. W.  Milkovich S. M.  Putzig N. E.
*Mars North Polar Layered Deposit Stratigraphy near Gemini Lingula from HiRISE Imagery and DTMs* [#2752]
A new HiRISE DTM, in conjunction with nearby images, are analyzed in order to establish consistencies and variability of NPLD stratigraphy in a region chosen to optimize eventual linking of visible and SHARAD radar layers.

Sori M.  Perron T.  Huybers P.  Aharonson O.
*Distinguishing Orbital Signals from Stochastic Variability in the Martian Polar Layered Deposits* [#2641]
We model formation of martian PLDs and use a dynamic time-warping algorithm to determine the goodness of fit between our model outputs and the planet’s recent insolation history, with the goal of doing the same for observed records of PLDs.
Martian Ground Ice: Theory, Modeling, Observations, and Terrestrial Analogues

Titus T. N. Cushing G. E. Prettyman T. H.
Thermal Emission Spectrometer Estimates of the Mars North Polar Ice Table Depth and Thermal Inertia [2786]
This study utilizes the diurnal cycle and the seasonal rise in temperature immediately following the complete sublimation of CO₂ ice, from the surface to determine thermal inertia and thickness of the top layer, and the thermal inertia of the lower layer of the polar regolith.

Wood S. E.
A General Analytic Model for the Thermal Conductivity of Loose, Indurated or Icy Planetary Regolith [2795]
This paper describes an analytic model for estimating the effective thermal conductivity of porous planetary regolith.

Siegler M. A. Aharonson O. Schorghofer N.
Laboratory Measurements of Thermal Properties of Martian Permafrost Analogues [1861]
In a series of laboratory experiments, we measure thermal conductivity, thermal diffusivity, and heat capacity of icy regolith created by vapor deposition under martian atmospheric conditions.

Fastook J. L. Head J. W. Marchant D. R.
Formation of Ice-Rich Lobate Debris Aprons Through Regional Icesheet Collapse and Debris-Cover Armoring [1063]
We use a flowband model to assess development of lobate debris apron sublimation lag thickness and lateral extent beneath scarps. We obtain estimates of the climate in place as the LDAs were forming during collapse of a larger, regional ice sheet.

Bandeira L. Saraiva J. Pina P.
Where do Terrestrial Polygons of Adventdalen (Svalbard) Stand in Relation to Quantitatively Characterized Martian Networks? [1998]
We present some results to verify where a terrestrial analogue network of Adventdalen, Svalbard (Norway) stands in relation to quantitatively characterized polygonal networks on Mars.

Characterizing Polygonal Terrains In-Situ on Adventdalen (Svalbard) for Comparison with Martian Analogues: The 2010 Field Campaign [1387]
This work summarizes the campaign carried out in June 2010 to characterize polygonal terrains in situ on Svalbard for martian analogue studies and presents some preliminary results.

Orloff T. C. Kreslavsky M. A. Asphaug E. I.
Mechanism for Boulder Clustering on Thermal Contraction Polygons [2630]
Boulders are clustered in polygon exteriors on high latitude martian patterned ground. Here we propose a mechanism involving seasonal frost and the thermal contraction of surface material.

Korteniemi J. Kreslavsky M. A.
Northern Patterned Ground Margin on Mars: Terrain Types and Age Estimates [2519]
We conduct a detailed survey of the northern polygonal terrain margin (latitude band 50°–70°N), identify terrain types, describe their association with distinct crater populations, and show geological evidence of orbital element driven climate changes.

Giacomini L. Ferrari S. Massironi M.
Tumuli vs Pingos: A Comparative Study Between Daedalia Planum and Elysium Planitia Features [1118]
We performed a comparative study between the Daedalia Planum and Elysium Planitia mounds considering the morphology, density distribution and the age. The analysis revealed that Elysium features could be pingos while the Daedalia ones can be tumuli.
Noguchi R.  Kurita K.
Rootless Cone? Pingo? or Mud Volcano? in Central Elysium Planitia, Mars [#1683]
It is possible that Mars has experienced recent (~100 Ma) magmatism. In central Elysium Planitia, the identification of cone-like landforms are discussed: rootless cones, pingos, or mud volcanos. From their morphology, the landforms are thought to be rootless cones.

Dickson J. L.  Head J. W.  Fassett C. I.
Ice Accumulation and Flow on Mars: Orientation Trends and Implications for Climate in the Late Amazonian [#1324]
Preliminary results of a mid-latitude survey of glacial-like features show a latitude-dependent orientation trend, suggesting micro-climate driven accumulation of ice in the Late Amazonian. This trend is identical to that of young martian gullies.

Schaefer E. I.
Morphometric Analysis of Valleys for Erosive Glacial Modification in the Northern Midlatitudes of Mars [#2796]
The cross-valley topographic profiles of five valleys in the northern mid-latitudes of Mars are examined for evidence of cold-based glacial modification.

Yakovlev V. V.
Conditions and Mechanism of Mars Big Hydrolaccoliths Formation [#1114]
The physical conditions for the emergence on the surface of Mars big hydrolaccoliths and possible mechanism of their formation are considered.

Schulson E. M.  Fortt A. L.
Measurements of Frictional Sliding of Cold Ice at −175°C [#1416]
The kinetic coefficient of friction of ice sliding slowly (5 × 10^8–1 × 10^−3 m s⁻¹) upon itself under low normal stresses (0.02–0.1 MPa) at −175°C increases with increasing velocity, from 0.39 ± 0.09 at the lowest velocity to 0.77 ± 0.04 at the highest velocity.

Craft K. L.  Lowell R. P.  Kraal E.
Models of Martian Hydrothermal Circulation and Ice Melt with Implications for Surface Feature Formation [#2334]
Here we investigate the amount of fluid provided to the martian surface by dike- and sill-driven hydrothermal systems with overlying ice layers. The resulting fluid flow rates are then compared to model estimates for formation of surface features on Mars.

Rodriguez J. A. P.  Tanaka K. L.
Evidence for In-Situ Trough Erosion in Planum Boreum, Mars [#2639]
We present geomorphologic evidence that demonstrates that north polar trough formation did not involve poleward migration. Instead, in situ ablation is proposed to have been the primary formational process of these features.

Guallini L.  Brozzetti F.  Marinangeli L.
First Evidence of Incipient Large-Scale Gravitational Tectonic Collapse in South Polar Layered Deposits? The Case of Promethei Lingula (Mars) [#1678]
In the present work we focus on the structural analysis of SPLD in Promethei Lingula, where we found broad and complex deformational systems. For the first time we report evidences of deep-seated gravitational slope deformations within PLD.
The high-elevation Antarctic Dry Valleys represent an extremely cold and dry environment where subsurface liquid water is not present. Field observations and data are used to characterize and model this system, as well as alpine regions on Earth and Mars.

SEASONAL ICE PROCESSES

**Sublimation-Dominated Active Layers in the Highlands of the Antarctic Dry Valleys and Implications for Other Sites [#2644]**


The high-elevation Antarctic Dry Valleys represent an extremely cold and dry environment where subsurface liquid water is not present. Field observations and data are used to characterize and model this system, as well as alpine regions on Earth and Mars.

**SEASONAL ICE PROCESSES**

Milkovich S. M. Byrne S. Russell P. S. Herkenhoff K. E.

*Variations in Surface Texture of the North Polar Residual Cap of Mars [#1816]*

Using two-dimensional FFT analysis, we characterize and map variations in the surface texture of the north polar residual ice cap to investigate the factors (distance from the pole, wind direction, and strength, etc.) at work in resurfacing the deposit.

Milkovich S. M. Plaut J. J.

*Preliminary Examination of Layer Texture Within the South Polar Layered Deposits, Mars [#1833]*

Variations in surface texture of layers within the south polar layered deposits may be a useful proxy for layer composition. The texture-based stratigraphy of the Promethei Lingula region will be compared with radar profiles of the area.

Hansen C. J. McEwen A. Mellon M. Portyankina G. Thomas N.

*Year 3 of HiRISE Observations of Southern Spring on Mars [#1651]*

Year 3 of HiRISE images of seasonal CO2 sublimation show substantial year-to-year variability in the onset of gas jets evidenced by fan-shaped deposits of fine material on top of the seasonal layer of ice. The locations of the ruptures however are similar.

Mount C. Titus T. N.

*Spatial and Temporal Density Analysis of the Mars Northern Seasonal Ice Cap [#1054]*

Time-dependent density variations in CO2 ices may indicate the depositional processes responsible for the formation of the seasonal polar cap.


*Martian Seasonal CO2 Frost Indicating Decameter-Scale Variability in Buried Water Ice [#1900]*

Understanding the current distribution of ground ice is a fundamental part of deciphering how this ice was emplaced. We examine the seasonal defrosting of CO2 observed by HiRISE as an indicator of decameter-scale ground-ice heterogeneity.

Horvath A. Bérczi Sz. Kereszturi A. Sik A. Szathmáry E.

*Observation of a Transitional Reversal During the Seasonal Defrosting of DDS at the Southern Polar Region of Mars [#1688]*

We observed a transitional reversal in the advancing dark dune spot (DDS) defrosting process in spring. After this interruption the defrosting process continued till the summer total defrosting of the surface in the Inca City Region of Mars.
ICY SURFACE-ATMOSPHERE INTERACTION

Dalton J. B. III, Shirley J. H., Paranicas C., Cassidy T., Prockter L. M., Kamp L. W.
Sulfuric Acid Hydrate on Europa: Exogenic Controls on the Radiolytic Sulfur Cycle [2678]
Spectral modeling of Galileo NIMS observations using cryogenic reflectance spectra can separate products of exogenic processing from endogenically-derived materials on Europa. H$_2$SO$_4$ hydrate abundances agree with predictions of electron and ion flux models.

Formation, Distribution and Loss of Rhea’s O$_2$-CO$_2$ Exosphere [2663]
We will discuss the Cassini spacecraft’s detection of an O$_2$-CO$_2$ exosphere at Saturn’s icy satellite Rhea, including its origin, distribution, and Cassini’s observations of pickup ions as evidence for ionization as a major exospheric loss mechanism.

Postberg F., Schmidt J., Hillier J. K., Kempf S., Srama R.
The Compositional Profile of Enceladus Icy Dust Plume from Cassini In-Situ Measurements [1849]
Measurements by Cassini’s dust detector during Enceladus plume crossings show strong variations in structure and composition. Salt-rich ice grains clearly dominate Enceladus’ solid emissions strongly favoring an abundant liquid water source close to the icy surface.

Waite J. H. Jr., Magee B., Brockwell T.
The Effect of Flyby Velocity on the Composition of the Enceladus Gas Torus as Measured by Cassini INMS [2818]
The observations of the Enceladus gas plume by the Cassini Ion Neutral Mass Spectrometer indicate changes in the H$_2$O, CO$_2$, CO, H$_2$, and unsaturated hydrocarbons as a function of the flyby velocity.

Chapman T. A., Yeoh S. K., Goldstein D. B., Varghese P. L., Trafton L. M.
Hybrid Model of Gas/Particle Plume of Enceladus [1853]
Based on in situ data of Enceladus, we construct a hybrid model of its plumes. The model divides the plume into two regimes. Direct simulation Monte Carlo is used near the vents, while a free-molecular model simulates the far field.

Wasiak F. C., Luspay-Kuti A., Blackburn D. G., Roe L., Chevrier V.
A Facility for Simulating Titan’s Environment [1322]
We describe our facility for simulating Titan’s environment to experimentally determine the short- and long-term stability of light organic volatiles at the surface and subsurface of Titan.

Luspay-Kuti A., Wasiak F. C., Chevrier V. F., Blackburn D. G., Roe L.
Measuring Evaporation Rates of Methane Under Simulated Titan Conditions [1736]
It has been shown before that liquids exist on present-day Titan. In this work, Titan conditions are generated in our simulation chamber, and the evaporation rate of liquid methane is measured under surface temperatures of 90–94 K.

Wasiak F. C., Hames H., Tullis J. A., Blackburn D. G., Chevrier V., Dixon J.
On Characterizing the Stability of Titan’s Lake Regions [1321]
Characterizing the stability of Titan’s lake regions using Geographic Information Systems (GIS).

Chopra N., Rivera-Valentin E. G., Luspay-Kuti A., Chevrier V. F.
Modeling the Stability of Liquid Methane on Titan [1643]
In order to understand liquid methane dynamics and replicate the seasonal cycle on Titan, we construct a coupled heat and mass transfer model and study the stability of pure liquid methane under Titan’s conditions.
Luspay-Kuti A. Rivera-Valentin E. G. Chopra N. Chevrier V. F.  
**Modeling the Stability of Ontario Lacus on Titan [#1747]**  
The stability of Ontario Lacus is modeled, assuming a composition of pure CH₄. Based on our results and assuming 9 m for the depth, 1.4% of the lake is evaporated after a year. Shoreline variations are expected, in agreement with observations.

**Seasonal Changes in Titan’s Meteorology Bring Rain to Low Latitudes [#1459]**  
Titan’s equinox / Brings equatorial clouds / Rain amid the dunes.

Coustenis A. Bampasidis G. Solomonidou A. Vinatier S. Achterberg R. Hirtzig M. Jennings D. Nixon C. Flasar M. Moussas X.  
**Temporal Variations in Titan’s Atmosphere and Surface [#1676]**  
We present work on Titan’s atmosphere and surface looking at variations in short and long periods of time.

Sharma P. Byrne S.  
**Comparison of Titan’s North Polar Lakes with Terrestrial Analogs Through Fractal Analysis [#1572]**  
The purpose of this study is to perform a fractal analysis on terrestrial lake shorelines, compare the results with pre-published estimates of Titan’s lake shoreline dimensions, and infer the dominant surface processes on Titan.

**Geology of Ontario Lacus on Titan: Comparison with a Terrestrial Analog, The Etosha Pans (Namibia) [#2581]**  
The study of a terrestrial analog, the Etosha Pan (Namibia), for Ontario Lacus on Titan seems to indicate that Ontario might be a partially liquid-filled basin.

**Topography of Titan’s Arctic Lake District: Implications for Subsurface Liquid Alkane Flow [#2677]**  
Karstic Terrain is highly permeable, facilitating subsurface flow and hydraulic adjustment of fluids. We look for evidence of karstic subsurface flow in Titan’s Arctic Lake district, based on high-resolution SARTopo data over lakes and surrounds.

Harrison K. P.  
**A Preliminary Investigation of Interlake Groundmethane Transport on Titan [#2533]**  
Topographic data are used to estimate methane flow rates in a hypothetical aquifer connecting lakes on Titan. Some rates are high enough to fill lakes over a few seasonal cycles, and compare favorably with evaporation rate estimates.

Drummond S. A. Burr D. M. Cartwright R. Black B. A. Perron J. T.  
**Global Mapping and Morphologic Classification of Titan Fluvial Features [#1919]**  
Global mapping of fluvial features has been completed in radar swaths through T71. Analysis of drainage network morphology has revealed evidence for tectonic activity globally; network link orientation may aid in defining stress fields.

Malaska M. Radebaugh J. Le Gall A. Mitchell K. Lopes R. Wall S.  
**High-Volume Meandering Channels in Titan’s South Polar Region [#1562]**  
Morphological measurements of two wide meandering channels near Sikun Labyrinthus, Titan, reveal characteristics similar to high-volume rivers on Earth. The channels are compared to a stretch of the Mississippi River near Mayersville, Mississippi.
Newman C. E.  Richardson M. I.  Lian Y.  Lee C.

Modeling Titan’s Stratospheric Superrotation and Tropospheric Methane Cycle [#2626]
We will show that stratospheric superrotation similar to that observed is produced by the latest version of TitanWRF, and is generated during episodic angular momentum transfer events. We will also present surface methane predictions.

---

**TITAN EVERYTHING**

Buckingham L. K.  Matthews L. S.  Hyde T. W.

Tholin Aggregation in Titan’s Atmosphere: Developing a Probabalistic Model [#1466]
The microphysics of aggregation of tholin in Titan’s atmosphere is numerically modeled. The collision probability for charged aggregates consisting of spherical monomers is determined for various altitudes for both daytime and nighttime charging conditions.

Jaramillo-Botero A.  Cheng M. J.  Cvicek V.  Beegle L. W.  Hodyss R.  Goddard W. A. III

First Principles Based Reactive Atomistic Simulations to Understand the Effects of Molecular Hyper Velocity Impact on Cassini’s Ion and Neutral Mass Spectrometer [#1948]
We have used the recently developed electron force field (eFF) and ReaxFF reactive force field to simulate the hypervelocity impacts experienced by the Cassini ion and neutral mass spectrometer during the Enceladus and Titian encounters.

Trainer M. G.  Niemann H. B.  Harpold D. N.  Atreya S. K.  Owen T. C.  Kasprzak W. T.

Laboratory Simulations of the Titan Surface to Elucidate the Huygens Probe GCMS Observations [#1399]
We are conducting a laboratory study to simulate the conditions of Titan’s surface (temperature, pressure, chemistry) to understand the surface composition as met by the Gas Chromatograph Mass Spectrometer experiment on the Huygens probe.

Collins G. C.  Polito P. J.  Litwin K. L.  Sklar L. S.

Resistance of Water Ice to Fluvial Abrasion and Implications for Erosion on Titan [#2781]
We present measurements of the tensile strength and abrasion susceptibility of pure and impure polycrystalline ice samples, and discuss applications to fluvial erosion on Titan.


Visible and near Infrared Reflectivity of Solid and Liquid Methane: Application to Hydrocarbon Lakes on Titan [#2038]
Using visible and near-infrared radiation from the National Synchrotron Light Source (NSLS), we report the reflectivity of solid (single crystal) and liquid methane at temperatures from 50–100 K.


Photometric Properties of Titan’s Surface at 5 µm Investigated with Cassini/VIMS Hyperspectral Images [#1495]
Global mosaics of Titan have been produced using VIMS hyperspectral images. The properties at 5 µm are studied using a systematic comparison with the corresponding mosaic of viewing angles.

Stiles B. W.  Hensley S.  Mitchell K. L.  Veeramacheneni C.

Extended Titan Topography from SAR [#1129]
We present surface height profiles of Titan co-located with each Cassini RADAR image from the primary and first extension of the Cassini mission. We exhibit new height profiles and discuss means of extending topographic profiles already produced for earlier observations.

Areas of Sand Seas on Titan from Cassini Radar and ISS: Fensal and Aztlan [#2804]
Outlines of sand seas on Titan have been made using Cassini ISS and RADAR data.

Savage C. J. Radebaugh J.
Parameter Analysis of Titan’s Dunes Reveals Surface Evolution History [#2261]
Analysis of Titan’s dunes show decrease in dune width and spacing with increasing lat., possibly due to lower sediment mobility or decreasing maturity; and a single population of dunes, possibly due to enduring stability of dune-forming conditions.

Mountains on Titan: Height and Slope Analysis [#2798]
By analyzing the mountain heights and slopes on Titan, we are able to understand more on tectonic origin.

Neish C. D. Lorenz R. D.
Titan’s Global Crater Population: A New Assessment [#1412]
Titan’s cold surface / Short on craters, big and small / A youthful planet.

Williams D. A. Radebaugh J. Lopes R. M. C. Stofan E.
Geomorphologic Mapping of the Menrva Region of Titan [#1042]
We discuss the results of application of planetary mapping techniques to Cassini RADAR data covering the Menrva region of Saturn’s moon Titan.

ATMOSPHERES: OBSERVATIONS AND PROCESSES

Daniels J. T. M. Russell C. T. Strangeway R. J. Zhang T. L.
Venus Lightning: Measurements Near the Polar Vortex [#1106]
Statistics of occurrence of lightning obtained by Venus Express over the north pole of Venus show an apparent correlation with the location of the polar vortex.

Migliorini A. Grassi D. Montabone L. Lebonnois S. Drossart P. Piccioni G.
Nightside Atmospheric Temperature Fields from the VIRTIS-Venus Express Data [#1076]
Thermal structure of the Venus nightside is investigated using VIRTIS-Venus Express data, covering the latitude range from 80°S to 80°N. Comparison with the LCD Venus GCM model show a qualitatively remarkable agreement.

Migliorini A. Piccioni G. Drossart P. Politi R. Snels M. Gérard J. C.
Oxygen Nightglow Investigation in the Visible Spectral Range, Using VIRTIS/Venus Express Data [#1126]
Oxygen emissions in the visible spectral range, detected with VIRTIS on board Venus Express, in the upper atmosphere of Venus.

Gondet B. Bertaux J. L. Bibring J. P. Montmessin F. Lefèvre F.
First Detection of O2 Recombination Nightglow Emission at 1.27 μm in the Atmosphere of Mars with OMEGA/MEX and Comparison with Model [#1884]
OMEGA acquired night side limb profiles of the martian atmosphere. O2 emission at 1.27 μm is observed. These observations of O2 are compared with LMD-GCM, showing that downward transport from the thermosphere are occurring in the polar night.

Moores J. E. Osinski G. Whiteway J. A. Daerden F.
Stratification of HDO During Cloud Formation on Mars [#1402]
The formation of water ice cloud provides a means by which atmospheric HDO can be segregated, changing the observed D/H ratio. We will present numerical model results showing the extent of this vertical stratification.
Lawrence K. P. Brecht S. H. Ledvina S. A. Paty C. Johnson C. L.  
Mineral Atmospheric Loss During Valley Network Formation Despite Lack of a Global Magnetic Field on Mars [#2495]

We compare integrated atmospheric loss rates with temporal uncertainties in the martian hydrologic history to determine whether a coeval dynamo is required to maintain conditions amenable to surface water during the late Noachian.

Wang M. Kobayashi T. Ping J.  
Ionospheric Seasonal Variation in Martian Equatorial Region [#2510]

Using TEC of the martian ionosphere collected over one martian year from MARSIS onboard Mars Express, we have measured temporal changes of the martian ionosphere that correlate with the seasonal cycle of carbon dioxide, which is exchanged between the polar cap and atmosphere.

---

**Venus**

Johnson N. M. Wegel D. C.  
Venus Pressure Chamber: A Small Testing Facility Available to the Community [#1434]

A small, high-pressure chamber that simulates Venus’ surface conditions is available for testing small components and/or running short-term experiments. This poster provides details about the chamber’s specifications and accessibility.

Remote Raman-Laser Induced Breakdown Spectroscopy (LIBS) Geochemical Investigation Under Venus Atmospheric Conditions [#1568]

The Surface and Atmosphere Geochemical Explorer, one of the New Frontiers candidate missions, includes a remote Raman–LIBS instrument to determine both chemistry and mineralogy. We present Raman and LIBS data acquired under Venus-analog conditions.

Raman Spectroscopy of Low Concentration of Minerals in Basaltic Glass Analog Matrix Applicable to Planetary Exploration [#1250]

One of the goals of this project was to determine stand-off Raman detection limits at 2 m distance for mixed minerals in a glass matrix, analogous to phenocrysts in a magma or alteration materials mixed into a weathered rock on Venus’ surface.

Aveline D. C. Abbey W. J. Choukroun M. Treiman A. H. Dyar M. D. Smrekar S. E. Feldman S. M.  
Rock and Mineral Weathering Experiments Under Model Venus Conditions [#2165]

We exposed key rocks and minerals to a high T, high P, SO2-rich atmosphere to simulate almost five years of surface weathering under model Venus conditions. Our preliminary results are consistent with theoretical models (e.g., calcite → anhydrite).

Bondarenko N. V. Kreslavsky M. A.  
Semitransparent Volcanic Materials on Radar Images of Venus [#2034]

Possible observational effects due to semitransparent lava flows on Venus were analyzed and illustrated. Numerous examples show that interpretation of Magellan radar images requires consideration of subsurface scattering.
Bondarenko N. V.   Head J. W.  
*Mantle Deposits on Venus: The Role of Surface Structure* [#1578]
We found a strong similarity between enhanced linear polarization and apparent decrease in observed surface emissivity for mantles examined, suggesting that both effects result from the same processes and that a smooth mantle interface exists.

Kumar P. S.   Head J. W.  
*Geological Evolution of Lada Terra, Venus* [#1090]
This paper presents geologic history of Lada Terra of Venus. Geological mapping revealed formation of large-scale extensional belts, coronae, and volcanogenic plains. The sequence of geologic events provides clues to deeper geodynamic processes.

James P. B.   Zuber M. T.   Phillips R. J.  
*Global Maps of Crustal Thickness and Mantle Mass Anomalies on Venus* [#2456]
By separating the deep and shallow components of topographic compensation, we have produced a global crustal thickness map of Venus. We have also mapped mass anomalies in the mantle and provided bounds on the mean crustal thickness.

King S. D.  
*High Resolution Calculations of 3D Spherical Shell Convection and Venus Gravity, Topography, and Recent Volcanism* [#1467]
The mechanism responsible for the observed age of the venusian surface continues to be debated. I will show that venusian gravity, topography, and emissivity can be reconciled with a uniform viscosity, favoring the progressive resurfacing mechanism.

Galgana G. A.   McGovern P. J.   Grosfils E. B.  
*The Development of Giant Radiating Dike Swarms on Venus from Coupled Mechanical Models* [#2783]
Coupled numerical models of flexure-causing uplift and magma pressurization predict reservoir failure modes and magma intrusion patterns, explaining the formation of radial and ring fractures on the surface of Venus, related to the development of dikes.

Stofan E. R.   Glaze L. S.   Grinspoon D. H.  
*Characterizing Volcanic Eruptions on Venus: Some Realistic (?) Scenarios* [#2525]
We constrain the atmospheric contributions of explosive volcanic eruptions on Venus, advancing beyond previous studies by linking improved data on the distribution and nature of volcanic features to plume modeling and atmospheric dynamics.

Verner K. R.   Galgana G. A.   McGovern P. J.   Herrick R. R.  
*Insights into the Structure and Evolution of Large Volcanoes on Venus from High-Resolution Stereo-Derived Topography* [#2712]
Our research utilizes a new data set to study surficial strain patterns in order to understand volcanic processes on Venus.

Miller D. M.   Gregg T. K. P.  
*Characteristics and Geologic Relationships of Shield Fields Versus Shield Plains on Venus* [#1550]
This project analyzes the morphological characteristics of two types of small shield volcano clusters on Venus, quantifies shield cluster morphologies, and examines the contribution shield clusters have to resurfacing processes.

Leach J. H. J.  
*The Flat Topped Volcanoes of Venus: Processes and Possible Analogues* [#1278]
This paper looks at the type of process that could form the flat topped volcanoes on Venus by examining possible terrestrial analogues.
Guseva E. N.  Basilevsky A. T.  Head J. W.  
*Geological Mapping of the Eastern Part of Quadrangle V-36: Thetis Regio, Venus*  
This work is a continuation of the 1:5M geologic mapping of the V-36 quadrangle of Venus that is a part of the USGS planetary mapping project. We present the results of the mapping of the eastern part of the quadrangle.

Gilmore M. S.  Resor P. G.  Ghent R.  Senske D. A.  Herrick R. R.  
*Constraints on Tessera Composition from Modeling of Tellus Regio, Venus*  
Fold wavelengths in a collision zone in Tellus Regio are used to constrain tessera lithospheric parameters including composition. Dry mafic and felsic rheologies are reasonable, as well as some wet mafic and felsic rheologies under high strain rate.

Bleamaster L. F. III  
*Comparing Volcanic Resurfacing Styles on Venus: Results of Geologic Mapping Studies of the Isabella (V-50) and Devana Chasma (V-29) Quadrangles*  
The BAT (Beta-Atla-Themis) region on Venus is of particular interest with respect to evaluating global paradigms regarding Venus’ geologic history, tectonic and thermal evolution.

McGowan E. M.  McGill G. E.  
*Geology of the Lachesis Tessera V18 Quadrangle, Venus*  
Summary of the geology of the Lachesis Tessera, focusing on a linear grouping of structural features that includes Breksta Linea. This grouping includes an unnamed corona that is obscured by a large gore.

Crown D. A.  Stefan E. R.  Bleamaster L. F. III  
*Geologic Map of the Guinevere Planitia Quadrangle of Venus*  
Geologic mapping of the Guinevere Planitia Quadrangle of Venus shows a general progression from upland terrain to volcanic plains and then to shield volcanoes and flow fields but also reveals a complex interplay between volcanic and tectonic processes.

Ivanov M. A.  Head J. W.  
*The Formation and Evolution of Tessera and Insights into the Beginning of the Recorded History on Venus: Geology of the Fortuna Tessera Quadrangle (V-2)*  
The Fortuna Tessera quadrangle (V-2, 50°–75°N, 0°–60°E) allows approaching of the problem of the transition from latent to exposed periods of evolution of Venus. Here we present the first results of mapping of the V-2 quadrangle.

---

**Planetary Mission Concepts**

Lorenz R. D.  
*A Long-Duration Stand-Alone Venus Lander Mission: Scientific and Mission Design Considerations*  
Feel Venus’ heartbeat / Try fifty days, or two hundred / Sun, Earth rise and set.

Esposito L. W.  
*SAGE New Frontiers Mission to Venus*  
SAGE, the Venus Surface and Atmosphere Geochemical Explorer, is proposed to launch to Venus in December 2016.

Graham P.  Snyder G.  Open Luna Science Team  
*OpenLuna: An “Open Source”, Privately Funded, Return to the Moon Mission*  
The OpenLuna Foundation seeks to return mankind to the lunar surface through private enterprise and to do so in a way that it is accessible to everyone through open-source-style development and private funding.
Miller R. S.
*The Lunar Occultation Observer (LOCO) — A Nuclear Astrophysics Mission All-Sky Survey Concept [#2016]*
The Lunar Occultation Observer (LOCO) is a new $\gamma$-ray astrophysics mission concept expected to have unprecedented sensitivity in the nuclear $\gamma$-ray regime (~0.1–10 MeV).

Yang H. W.   Zhao W. J.   Wu Z. H.
*Some Considerations for Lunar Precise Gravity Field Determination from Orbiter Tracking Data [#2841]*
Not as on the Earth, GPS has little advantages in gravity measurement for planetary research on other planets.

Huertas A.   Cheng Y.
*Automatic Mapping of Lunar Craters and Boulders [#1272]*
We present automatic algorithms for the detection and mapping of boulders and craters from LRO NAC imagery for 25 regions of interest on the lunar surface. Detected craters and boulders are then used in constructing hazard maps for lunar surface missions.

Vizi P. G.
*Possibilities After Governmental Space Research like Micro and Nano Space Probes — The Hungarian Puli Space [#2777]*
Governmental operation is decreasing and private inventions are increasing. Is this a reachable goal to make a new generation of devices like cube sats and micro probes to use for lunar and planetary research?.

Deák M.
*Landing Site Analysis for Low-Budget Lunar Missions — Landing Site Candidates of Team Puli Space, Participant of the Google Lunar X Prize [#1410]*
The landing site analysis of privately funded low-budget lunar missions, for example, the mission of the Google Lunar X Prize participant Team Puli Space, is more influenced by technological possibilities than the government-funded missions.

Gallegos Z. E.   Donohue P.   Hammond N.   Potter R. W. K.   Kring D. A.
*Maunder Crater: A Case Study of a Landing Site Designed to Full-Fill Multiple NRC [2007] Science Objectives [#1958]*
This study aims to describe a landing site on the Moon where all four science goals in Concept 6 of the National Research Council’s [2007] The Scientific Context for Exploration of the Moon: Final Report can be addressed simultaneously.

*Suggested Landing Sites to Study Key Planetary Processes on the Moon: The Case of Schrödinger Basin [#1791]*
This work presents lunar landing sites that would allow the study of key planetary processes through the diversity of crustal rocks, with an emphasis on Schrödinger basin, where two landing sites are suggested.

*Identification of Science-Rich Mission Sites Designed to Test the Lunar Magma Ocean Hypothesis [#1844]*
The present work aims at determining the best science-rich mission sites that could help improve our understanding of planetary differentiation. We expect to learn more about the magma ocean hypothesis by sampling the diversity of lunar crustal rocks.

Jilly C. E.   Sharma P.   Souchon A. L.   Blanchette-Guertin J. F.   Flahaut J.   Kring D. A.
*Lunar Landing Sites to Explore the Extent of KREEP and Its Significance to Key Planetary Processes [#1270]*
We present a list of possible lunar landing sites that explore the extent of KREEP. Samples of lunar material from these sites may help to determine the nature of primordial urKREEP and KREEP basalts, to further constrain models of key planetary formation processes.
Sharma P. Blanchette-Guertin J. F. Jilly C. E. Flahaut J. Souchon A. L. Kring D. A.
Identifying Lunar Landing Sites for Sampling Lower Crust and Mantle Material [1579]
In accordance with the NRC 2007 report The Scientific Context for Exploration of the Moon, we have conducted a
global survey to determine landing sites on the Moon where the lower crust and/or underlying mantle may be
exposed at the surface.

Mission Strategies for Determining the Vertical Extent and Structure of the Lunar Megaregolith [1405]
We propose three mission strategies to assess the vertical extent and structure of the lunar megaregolith, one of the
scientific goals presented in the NRC 2007 Scientific Context for the Exploration of the Moon report.

Neal C. R. Banerdt W. B. Alkalai L. Lunette Team
Lunette: A Two-Lander Discovery-Class Geophysics Mission to the Moon [2832]
The document “The Scientific Context for the Exploration of the Moon” designated understanding the structure and
composition of the lunar interior as the second highest priority lunar science concept that needs to be addressed.

The Science Objectives of Japanese Lunar Lander Project SELENE-II [2778]
Japanese lunar lander, ‘SELENE-II’ is being planned as a successor to ‘Kaguya’. SELENE-II science mission team
has been actively working to maximize the science gain. In this presentation we report the current status of the
science instruments and scenario.

Zelenyi L. M. Khartov V. V. Mitrofanov I. G. Martynov M. B.
Short- and Mid-Term Russian Program [1804]
The concept of Russian robotic lunar program is presented for short-term and mid-term perspectives, which goal is to
study polar regions of the moon.

Mitrofanov I. G. Zelenyi L. M. Tret’yakov V. I. Dolgopolov V. P.
Science Program of Lunar Landers of “Luna-Glob” and “Luna-Resource” Missions [1798]
Program of scientific investigations is presented for two Russian polar landers: Luna Resource and Luna Glob. This
program has to address two tasks: studies of composition of lunar polar regolith and studies of lunar exosphere at
both poles.

Further Development of Small Robotic Landers for Planetary Missions [2201]
Touching the surface / Lander designs grant access / To dazzling worlds.

The Case for In Situ Exploration of Volatile Deposits at the Lunar Poles [1425]
Lunar poles harbor / Strange and wonderful ices / Awaiting our touch.

Beyer R. Cockrell J. Colaprete A. Fong T. Elphic R. Heldmann J. Pedersen L.
Feasibility and Definition of a Lunar Polar Volatiles Prospecting Mission [2735]
Substantial remote sensing data indicates that significant amounts of volatiles exist in the polar regions of the
Moon. In order to understand the cost, benefits, and requirements for exploiting these resources, surface prospecting
must be performed.
42nd LPSC Program, Tuesday Poster Sessions

Jackson T. L.   Farrell W. M.   Stubbs T. J.
Charging and Subsequent Dissipation of a Rover Wheel in the Lunar Polar Regions [#2144]
As a roving vehicle moves along the lunar surface in cold shadowed regions such as craters, tribo-charge will build up. This work will model the charging and dissipation times of a rover wheel rolling along the lunar regolith.

Li R.   He S.   Skopjelak B.   Meng X.   Yilmaz A.   Jiang J.   Banks M. S.   Kim S.   Oman C.
The Latest Progress of LASOIS: A Lunar Astronaut Spatial Orientation and Information System [#2100]
LASOIS is being designed to continuously provide spatial orientation and navigation information to astronauts and thereby reduce the effects of spatial disorientation. The system is expected to reduce relative positioning error to around 1%.

Rice J. W. Jr.
Manned NEO Mission EVA Challenges [#2816]
Manned near Earth objects (NEO) missions will present a host of new and exciting problems that will need to be better defined and solved before such a mission is launched. Here I will focus on the challenges for conducting asteroidal EVAs.

Chicarro A. F.
The European Robotic Exploration of the Planet Mars [#1325]
Following the 2016–2018 missions of the ESA and NASA Mars Exploration Program, a network of surface stations would be launched, to investigate the interior, geodesy, atmospheric dynamics, and geology of each landing site before Mars sample return.

Martin P. D.   Gleeson D. F.
Enhancing Landing Site Selection: Toward a Mars Landing Requirements Database [#2074]
Benefiting from a wealth of Mars data, and with the perspective of several upcoming landed missions that will prepare for an eventual Mars sample return mission, we are building a Mars landing requirements database to enhance landing site selection.

Weitz C. M.   Bishop J. L.
A Proposed Future Mars Landing Site in Noctis Labyrinthus [#1874]
We have identified candidate rover traverses and scientific targets for a proposed landing ellipse in one of the troughs of Noctis Labyrinthus.

Klaus K.   Elsperman M. S.   Smith D. B.   Cook T. S.
Multiple NEO Rendezvous, Reconnaissance and In Situ Exploration [#1979]
We propose a two spacecraft rendezvous with multiple NEOs. A two spacecraft mission mimics architecture for human explorers to use a mother ship to get from Earth to the NEO and a small body lander for in situ investigation on or close to the NEO.

Amor: A Lander Mission to Explore the C-Type Triple Near-Earth Asteroid system 2001 SN263 [#2695]
Amor is a Discovery-class spacecraft that will rendezvous with, land on, and explore a remarkable triple asteroid system: C-type near-Earth asteroid (NEA) 2001 SN263.
Safko T., Kelly D., Guzewich S., Bell S., Rivkin A. S., Kirby K. W., Gold R. E., Cheng A. F., Aldridge T. M., Colon C. M., Colson A. D., Lantukh D. V., Pashai P., Quinn D., Yun E. H. ASTERIA Team
ASTERIA: A Robotic Precursor Mission to Near-Earth Asteroid 2002 TD60

We present results from a student-led mission concept study of an asteroid rendezvous/lander. The mission was designed to provide initial data in advance of a human visit to an asteroid. A strawman payload and operations timeline will be discussed.

Marchis F., Burns K. J., Dankanich J., Bellerose J. GRC-Compass Team
Diversity: A Mission Concept for a Grand Tour of Multiple Asteroid Systems

Diversity is a mission concept to explore several multiple asteroid systems including 3749 Balam, 45 Eugenia, and 90 Antiope by successive rendezvous.

The Ganymede Interior Structure, and Magnetosphere Observer (GISMO) Mission Concept

As part of the 2010 NASA Planetary Science Summer School, the Ganymede Interior, Surface, and Magnetosphere Observer (GISMO) team developed a preliminary satellite design for a science mission to Jupiter’s moon Ganymede.

JET: Journey to Enceladus and Titan

JET is a Discovery mission to Enceladus and Titan that would acquire 50 m/pixel images of Titan’s surface and would analyze Enceladus’ plume and Titan’s upper atmosphere with a 10× larger mass range, 100× higher resolution, and 1000× better sensitivity than the Cassini mission.

Lunine J. I., Reh K., Sotin C., Couzin P., Vargas A.
Titan Aerial Explorer: A Mission to Circumnavigate Titan

After the spectacular discovery of an active methane cycle on Titan by Cassini/Huygens, a key next step is a mission that can simultaneously cover large areas and yet perform close-up observations and in situ investigations. We describe a balloon-borne mission to do so.

ENVIRONMENTAL ANALOGS: NOT EXACTLY CLUB MED

Romig B. A., Kosmo J. J.
Desert Research and Technology Studies (D-RATS) 2010 Mission Overview

The 13th annual Desert RATS remote analog field test was conducted in August and September 2010 near Flagstaff, Arizona. A dual rover traverse was conducted over 14 days under different communications and operational concept scenarios.

Love S. G.
The Role of the Spacecraft Operator in Scientific Exploration

Pilot and flight engineer crew members can improve scientific exploration missions and effectively support field work that they may not understand by contributing leadership, teamwork, communication, and operational thinking skills.

Eppler D. B., Ming D. W.
Planetary Surface Science Operations for Human Missions: The 2010 Desert Research and Technology Test

Desert RATS is a hardware and operations test carried out annually in the Arizona desert. These activities exercise science operations teams, crew and hardware in a multi-day roving test, defining requirements for future planetary science operations.
Eppler D. B.   Ming D. W.
*Science Operations Development for Field Analogs: Lessons Learned from the 2010 Desert Research and Technology Test* [#1831]
RATS 2010 tested varied communication states and rover operations. Effective science operations and the best science return occur when the science team and crew members have a background in the science mission and training in the mission operations.

Gruener J. E.   Loefgren G. E.   Bluethmann W. J.   Bell E. R.
*NASA Desert RATS 2010: Preliminary Results for Science Operations Conducted in the San Francisco Volcanic Field, Arizona* [#1499]
Science operations conducted during NASA’s 2010 Desert RATS activities consisted of four two-person rover crews, with each crew conducting six days of field exploration. Each crew traveled over 60 km, and approximately 200 kg of samples was collected overall.

*The Traverse Planning Process for the DRATS 2010 Analog Field Simulations* [#2054]
DRATS 2010 operated simultaneously 2 rovers in the field for 12 days, mandating the design of 24 individual traverses within numerous technical and operational constraints.

Skinner J. A. Jr.   Fortezzo C. M.
*Traverse Planning for Desert Research and Technology Studies (DRATS) 2010 Activities: Strategic Guidance from Photogeologic Mapping* [#2727]
We summarize NASA/JSC and USGS collaborative efforts in support of DRATS 2010 with particular attention to the construction and use of project-specific photogeologic maps.

Evans C. A.   Bell M. S.   Calaway M. J.   Graff T.   Young K.   Desert RATS Science Team
*GeoLab’s First Field Trials, 2010 Desert RATS: Evaluating Tools for Early Sample Characterization* [#1564]
We built a habitat-based laboratory, GeoLab, with a glovebox for handling samples and an instrument for collecting preliminary data to characterize those samples. GeoLab was tested as part of the 2010 Desert Research and Technology Studies.

Calaway M. J.   Evans C. A.   Bell M. S.   Graff T. G.
*GeoLab Hardware Operational Testing and Evaluation: As Integrated into NASA’s 2010 Habitat Demonstration Unit 1 — Pressurized Excursion Module* [#1473]
Test evaluation summary for GeoLab 2010, which was designed to provide an analog isolation containment system for preliminary examination, curation decisions, and return-to-Earth prioritization of geologic material collected on a planetary surface.

Deans M. C.   Lees D.   Smith T.   Cohen T.   Morse T.   Fong T.
*Field Testing Next-Generation Ground Data Systems for Future Missions* [#2765]
Our exploration ground data system provides software for science ops, including planning, monitoring, archiving, and search. In 2010, xGDS supported three field tests with different teams, goals, schedules, and complimentary lessons learned.

Young K. E.   Bleacher J. E.   Hurtado J. M. Jr.   Rice J.   Garry W. B.   Eppler D.
*Conducting Planetary Field Geology on EVA: Lessons from the 2010 DRATS Geologist Crewmembers* [#1951]
We present the 2010 DRATS crewmember opinions on conducting field geology while on EVA. Through our experience in a terrestrial analog environment, we gained insights into technology and procedures that can be adopted in the next planetary surface exploration mission.

*Lessons Learned for Geologic Data Collection and Sampling: Insights from the Desert RATS 2010 Geologist Crewmembers [#1334]*

This contribution reports on the Desert RATS geologist crew experiences and lessons learned regarding the collection of field geologic data and samples.

Bleacher J. E.  Hurtado J. M. Jr.  Young K. E.  Rice J.  Garry W. B.  Eppler D.  

*Desert RATS 2010 Operations Tests: Insights from the Geology Crew Members [#1774]*

The 2010 Desert Research and Technology Studies tested several communications and exploration strategies. We discuss the strengths and weaknesses of each from the perspective of the geology crew members who participated in the test.

Yingst R. A.  Cohen B. A.  Ming D. W.  Eppler D. B.  

*Comparing Apollo and Mars Exploration Rover (MER) Operations Paradigms for Human Exploration During NASA Desert-RATS Science Operations [#1891]*

We compare results from Desert-RATS field tests that utilize models based on science conducted for Apollo (integrated science backroom) and the Mars Exploration Rovers (science backroom split into tactical and strategic tasks).

Steele A.  Amundsen H. E. F.  Fogel M.  Benning L.  Schmitz N.  Conrad P.  Younse P.  Backes P.  AMASE 2010 Team  

*The Arctic Mars Analogue Svalbard Expedition (AMASE) 2010 [#1588]*

AMASE 2010 was the latest of a series of expeditions that bring NASA and ESA scientists and engineers together in a Mars analogue environment.

Younse P.  DiCicco M.  Morgan A. R.  Conrad P.  Steele A.  Amundsen H. E. F.  Backes P.  AMASE 2010 Team  

*AMASE Rover Platform for Testing Instrumentation for Potential Astrobiology and Mars Sample Return Missions [#1581]*

The AMASE rover platform used to test instruments, sample acquisition, and caching systems for potential astrobiology and Mars sample return missions is described.

McAdam A. C.  ten Kate I. L.  Stern J. C.  Mahaffy P. R.  Blake D. F.  Morris R. V.  Steele A.  Amundson H. E. F.  AMASE 2010 Team  

*Field Characterization of the Mineralogy and Organic Chemistry of Carbonates from the 2010 Arctic Mars Analog Svalbard Expedition by Evolved Gas Analysis [#2136]*

Carbonate data show that evolved gas analyses similar to those planned for the MSL SAM instrument suite can give constraints on sample organic chemistry, organic matter-mineral associations, and volatile-bearing minerals present at minor abundances.

Stern J. C.  McAdam A. C.  ten Kate I. L.  Mahaffy P. R.  Steele A.  Amundson H. E. F.  

*δ13C of Mars Analog Carbonates Using Evolved Gas — Cavity Ringdown Spectrometry on the 2010 Arctic Mars Analog Svalbard Expedition (AMASE) [#2403]*

The capability of the SAM instrument suite to measure δ13C of CO2 from thermal decomposition of carbonate was simulated using a Hiden EGA-MS system and a Picarro Cavity Ringdown CO2 isotope analyzer on the AMASE 2010 expedition to Svalbard, Norway.

Conrad P. G.  Steele A.  Younse P.  Di Cicco M.  Morgan A. R.  Backes P.  Eigenbrode J. E.  Marquardt D.  Amundsen H. E. F.  

*Mono Lake Analog Mars Sample Return Expedition for AMASE [#2218]*

An analog mission to test a coring and caching concept for Mars Sample Return (MAX-C) architecture.
Analog field studies at the Haughton-Mars Project (HMP) on Devon Island suggest that productive planetary field science can be conducted by humans from within the confines of a highly mobile, well-equipped, and well-instrumented pressurized vehicle.


**Potential In Situ Exploration of Subsurface Ice on the Moon Using EVA and Robotic Follow-Up: The Haughton Crater Lunar Analog Study [#2829]**

We performed a simulated EVA experiment and a robotic follow-up using Lidar, GPR, Panoramic, and Micro-Imaging Cameras and XRF to re-explore the sites with the main objective of providing metric observations to quantify *in situ* subsurface ice presence.

Deans M. C. Bualat M. G. Fong T. Heggy E. Helper M. Hodges K. V. Lee P.

**Field Testing Robotic Follow-Up for Exploration Field Work [#2601]**

In the summer of 2010, we conducted a simulation of a robotic follow-up mission with a robot at Haughton Crater and mission control at NASA Ames. The test improved our understanding of how robots can help increase productivity and complement human crews.


**A Lunar Analogue Mission: Sample Return to the South Pole-Aitken Basin [#2515]**

In support of future sample return missions, our team has successfully completed the first of three deployments in a lunar analogue mission to the South Pole Aitken Basin.


**Lunar Analogue Mission: Overview of the Site Selection Process at Mistastin Lake Impact Structure, Labrador, Canada [#2594]**

We provide an overview and lessons learned for site selection processes for a CSA funded lunar analogue mission to the Mistastin Lake Impact Structure in Labrador, Canada.


**Issues of Geo-Focused Situational Awareness in Robotic Planetary Missions: Lessons from an Analogue Mission at Mistastin Lake Impact Structure, Labrador, Canada [#2576]**

Geo-focused situational awareness issues (scale, relief, geologic detail, and time constraints) are experienced differently by mission control than by field geologists. Operations and instrumentation planning must take these aspects into account.

Beauchamp M. Osinski G. R. Unrau T. Marion C. Mader M. Antonenko I. Barfoot T.

**Ground Penetrating Radar (GPR) Investigations of the Mistastin Lake Impact Structure: A Case for GPR on the Moon [#2147]**

We examine the use of ground penetrating radar by a “simulated rover” at the Mistastin Lake impact structure and the potential applications to using this instrument on lunar rovers.
In order to assess the capabilities of GPR in planetary geologic studies, we measure and characterize GPR signatures of geologic environments that may be encountered on the Moon and compare them with ground-truth observations of subsurface exposures.

Geological, astrobiological, and robotic criteria for the selection of the Jeffrey Mine in Asbestos, Québec, Canada as a micro-rover roving site for the Mars Methane Analogue Mission.

The Mars Methane Analogue Mission (M³) project is designed to simulate a rover-based search for, and analysis of, methane sources on Mars at a serpentinite open pit mine in Quebec, using a variety of instruments.

We present results of analysis of sulfate-rich soil cores from Mars analog site in Utah.

For planetary mission planning, analogue operations are being used. This poster examines considerations based on observations from two Mars stations. This poster is some of the information gathered for habitat design for the OpenLuna Outpost.

NEEMO (NASA’s Extreme Environment Mission Operations) at the Aquarius underwater habitat off Key Largo, Florida provide valuable mission planning and operations experience as well as crew training for living and working in the extreme environment of a planetary surface such as a NEO.

DAMA is a comprehensive and standard Web-distributed DB of hyperspectral field surveys based on an interoperable SOA. The uniqueness of DAMA lies upon the innovative data model design and proper OWS for Discovery, Access and Transformation of data.
Garry W. B. Zimbelman J. R. Bleacher J. E. Braden S. E. Crumpler L. S.

*Lava Flow Inflation Features on the Moon?: A Comparison of Ina with Terrestrial Analogs [#2605]*

The enigmatic lunar volcanic feature, Ina, has a distinct morphology and complex origin. We propose a lava flow inflation model for the formation of Ina based on our field observations of lava flow inflation features in Hawaii, Idaho, and New Mexico.

Smekens J-F. Christensen P. R.

*The Effect of Weathering and Outcrop Variability on Thermal Infrared Multispectral Remote Sensing Data: A Comparative Study in Gila Bend, AZ [#2743]*

In this study we compare TIR spectra from two different lithologies at three levels of resolution (laboratory spectrometer, TIMS, and ASTER) in an attempt to identify discrepancies and constrain the reasons for those differences.

Bristow T. F. Milliken R. E.

*The Use of Mineral Facies Models of Terrestrial Saline Lakes as Potential Guides to the Origin of Martian Phyllosilicates [#2457]*

Physiochemical controls on the spatial and stratigraphic trends of clay minerals in terrestrial saline lakes are presented with the aim of providing additional criteria for determining the origins of martian phyllosilicates.

Berard G. M. Cloutis E. A. Stromberg J. M. Mann P. Horgan B. Rice M.

*A Hypersaline Spring Analogue in Central Manitoba for Arabia Terra’s Potential Ancient Spring Deposits [#2436]*

Both the concentrations of dissolved ions and molecules in the water, and the precipitation of ferric minerals and gypsum, decrease with increasing distance from the main springs, indicating that the springs are their primary source.

Glamoclija M. Steele A. Fogel M. L.

*Microbial Influences on Aeolian Sulfates; A Case Study of a Dune Field at White Sands National Monument, New Mexico [#2183]*

Similarly to martian sulfate-rich dunes, the White Sands National Monument exhibits partially different mineral signatures of dune crests and interdune areas. At the WSNM these differences are caused by diagenetic processes and by biological activity.

Stromberg J. Berard G. Mann P. Cloutis E.

*Intracrater Evaporite Deposits of the Lake St. Martin Impact Structure: Implications for Mars [#2170]*

The gypsum-rich intracrater evaporate deposits of the Lake St. Martin impact structure and its spectrally detectable endolithic microbial communities make it a relevant analogue for similar deposits on Mars.


*Chemistry and Mineralogy of Antarctica Dry Valley Soils: Implications for Mars [#2670]*

The aim was to characterize the chemistry and mineralogy of a site from two sites, a subxerous soil in Taylor Valley, and an ultraxerous soil in University Valley. The style of aqueous alteration may have implications for pedogenic processes on Mars.

Berard G. M. Stromberg J. M. Cloutis E. A. Mann P. Horgan B. Rice M.

*Desiccation of Algal Mats from Analogue Sites when Exposed to Mars-Like Conditions [#2489]*

After exposure of biotic materials to Mars-like conditions, precipitated minerals are visible in the spectra and a 0.67-μm absorption band indicates the presence of chlorophyll even after desiccation.
Davatzes A. E.  Monshizadegan C.

In Situ Chemical Analyses of Archean Rocks: Terrestrial Analog for Planetary Field Studies

XRF and laser Raman analysis of chemical and potential microbial-mat sediments from the Barberton greenstone belt, South Africa.

---

**DATA TOOLS, ACCESS, AND ARCHIVING**

Manaud N.  Heather D.  Barthelemy M.  Martinez S.  Vazquez J. L.  Szumlas M.

*ESA’s Planetary Science Archive and Associated Scientific Activity* [#1078]

The European Space Agency’s Planetary Science Archive (PSA) makes all scientific and engineering data returned by ESA’s planetary missions accessible to the world-wide scientific community. It also provides additional support for the production of scientific data.

Slavney S.  Arvidson R. E.  Guinness E. A.  Stein T. C.

*PDS Geosciences Node Data and Services* [#1895]

The Geosciences Node of NASA’s Planetary Data System (PDS) works directly with NASA missions and the science community to ensure that quality science data archives are produced and made available to the planetary science community.

Wang J.  Bennett K. J.  Scholes D. M.  Slavney S.  Guinness E. A.  Arvidson R. E.

*Searchable Observation Data in PDS’s Orbital Data Explorer* [#1896]

NASA’s PDS Geosciences Node’s Orbital Data Explorers support observation databases together with web-based query tools to subset MOLA/LOLA/Diviner data at particular area and to provide derived products for further analysis or making customized maps.

Stein T. C.  Arvidson R. E.

*Increasing the Value of Planetary Data Archives Through Strong Producer-Archivist Interaction* [#2061]

This abstract discusses ways in which early and regular interaction between the Planetary Data System and data producers is beneficial.

Bailen M. S.  Akins S. W.  Sucharski B.  Gaddis L.  Hare T. M.  Raub R.

*Improvements to the PDS Planetary Image Locator Tool (PILOT)* [#2214]

The Planetary Image Locator Tool (PILOT) is a web-based portal and map interface that provides a robust search engine for several Planetary Data System (PDS) image catalogs available from the Unified Planetary Coordinates (UPC) database.


*WorldWide Telescope Mars* [#2337]

The NASA/Microsoft WorldWide Telescope (WWT) Mars collaboration produces large mosaics of planetary imagery that can be easily displayed and navigated, making it easier for scientists and engineers to publish and access planetary geospatial data via the Internet.

Archinal B. A.

*Overview of the IAU Working Group on Cartographic Coordinates and Rotational Elements and Its Current Report* [#2362]

The work of the IAU Working Group on Cartographic Coordinates and Rotational Elements is described, as is their recent triennial report on coordinate systems for all solar system bodies. Input from the planetary community is encouraged.
Hare T. M.  Plessea L.  Akins S. W.  
*Planetary OGC Interoperability Experiment [#2638]*
As an ongoing effort to promote Internet protocols for sharing data and resources, several planetary facilities will conduct an Open Geospatial Consortium Interoperability Experiment to assess the benefits and limitations of current mapping standards.

Ohtake S.  Demura H.  Hirata N.  Terazono J.  
*Development of a GIS-Based Online Discussion System for Scientists with Google Earth API and Twitter [#2297]*
This study has developed an online discussion system cooperating with GIS for researchers in planetary sciences. We focused on mashup approach with the existing web services; Google Earth API and Twitter.

---

**EDUCATION AND PUBLIC OUTREACH: COMMUNITY ENGAGEMENT**

*Planetary Education and Outreach using the NOAA Science on a Sphere [#1052]*
The NOAA Science on a Sphere is the perfect medium for displaying planetary data that naturally map onto a spherical surface. We discuss our Jupiter and Solar System Tour movies for this system and available ancillary educational materials.

McCoy T. J.  
*asiikiwe nehi kiišikwi: A Multi-Generational, Culturally-Embedded Earth and Sky Curriculum for the Myaamiaki [#2227]*
We describe a curriculum to examine the Earth and sky from a distinctly Miami perspective. The curriculum includes stories for young children, activities for school-aged children, and examinations of places where geology and culture overlap for adults.

Osiński G. R.  Henry H.  Mader M.  Thomson L.  Gilbert A.  Marion C.  Papadimos A.  Brown P.  
*Collaborative Planetary Science Outreach Strategies: A Canadian Perspective [#2442]*
The Centre for Planetary Science and Exploration (CPSX) at The University of Western Ontario (UWO) is initiating a comprehensive outreach and education program focusing on planetary science and exploration.

Cudnik B. M.  
*Lunar and Planetary Meteors [#1522]*
This paper considers the latest findings in solar system impact phenomena, such as confirmed observations of meteors on the Moon and Jupiter, and suggests ongoing professional-amateur collaboration to further the study of these phenomena.

---

**EDUCATION AND PUBLIC OUTREACH: SCIENTIST ENGAGEMENT IN EDUCATION AND PUBLIC OUTREACH**

Shipp S.  Shupla C.  Dalton H.  Buxner S.  Boonstra D.  Scalise D.  
*The Year of the Solar System: Pathways for Scientist Involvement [#2618]*
YSS offers numerous opportunities for the planetary science community to raise awareness, build excitement, and make connections with educators, students, and the public about planetary science; visit http://solarsystem.nasa.gov/yss.
EDUCATION AND PUBLIC OUTREACH: UNDERGRADUATE EDUCATION

Piatek J. L.
Utilizing High Resolution Panoramas as Virtual Field Experiences in Undergraduate Planetary Science Courses [#1796]
Tier-scalable exercises utilizing high resolution panoramas allow students to explore terrestrial landscapes and outcrops virtually, and provide good context for interpreting spacecraft images of solar system bodies.

Coles K. S.
Human Exploration of Space: A College Survey Course [#1208]
The course “Human Exploration of Space” at Indiana University of Pennsylvania introduces students to the past and future of robotic spacecraft and human spaceflight.

Hegyi S. Bérczi Sz. Kereszturi A. Hargitai H.
E-Learning — Innovative Pedagogical Project in the Higher Education to Promote and Support Space Sciences and Technology [#1990]
The Pécs University’s e-Learning method of presentations represents a new online up-to-date system for the new web oriented student generation in sciences and mathematics, focusing on space sciences and technology, in accord with NASA STEM project.

Matias A. Carrico P.
Engaging Students in Astronomy and Space Exploration on a Fully Online, Non-Traditional Science Course [#2066]
Students are increasingly turning to the web for quality education that fits into their lives. Our Introductory Astronomy course is an example of a science course fully online that engages students in scientific inquiry and garners students’ interest.

EDUCATION AND PUBLIC OUTREACH: TRAINING THE NEXT GENERATION OF SCIENTISTS AND ENGINEERS

Benfield M. P. J. Turner M. W. Farrington P. A. Runyon C. J. Hakkila J.
The Strategic Partnership for the Advancement of Engineering Education (SPACE) Program — Teaching the Next Generation of Scientists and Engineers the NASA Spacecraft and Mission Design Process [#2143]
The SPACE Program is an innovative education initiative being undertaken by several universities in an effort to train the next generation of NASA scientists and engineers.

Turner M. W. Benfield M. P. J. Farrington P. A. Runyon C. J. Hakkila J.
The Academic AO Project: The Radio Astronomy on the Moon and Europa Missions [#2175]
The University of Alabama in Huntsville and the College of Charleston are continuing an educational program that seeks to simulate the NASA AO response process in the classroom.

NASA’s PSSS prepares the next generation of engineers and scientists for solar system exploration missions. Each summer, PhD candidates and post-doctoral students work with JPL’s Team X to develop a mission concept and present it to a review board.

Research Description

**EDUCATION AND PUBLIC OUTREACH: HIGH SCHOOL RESEARCH/COMPETITION**

Sipos A.   Vizi P. G.

*Simulated Mars Rover Model Competition 2010–2011 [#2014]*

This is a report about the organization and management of the Simulated Mars Rover Competition events of 2010 and 2011.

Lang Á.   Erdélyi S.   Nickl I.   Cserich D.   Kiss D.   Bérczi Sz.


We took planetary analog field measurements of pH by the HUSAR-5 rover along the red-mud polluted Riverside of the Marcal river after the sludge catastrophe in Ajka Alumina Plant, Hungary, and observed the gradually decreasing pH values.

**EDUCATION AND PUBLIC OUTREACH: K–12 RESOURCES**


*Development of Instructional Rock Kits for Use in Professional Development Workshops and Classrooms [#1608]*

The Planetary Science Institute (PSI) is creating a series of instructional rock kits and related informational materials that is being introduced to elementary and middle school science teachers in Tucson, Arizona, through our professional development workshops.

Graff P. V.   Stefanov W. L.   Willis K. J.   Runco S.   McCollum T.   Baker M.   Lindgren C.   Mailhot M.

*Expedition Earth and Beyond: Engaging Classrooms in Student-Led Research Using NASA Data, Access to Scientists, and Integrated Educational Strategies [#2104]*

Expedition Earth and Beyond, facilitated by the ARES Education Program at NASA JSC, is designed to help teachers promote student-led classroom research by using NASA data, providing access to scientists and using integrated educational strategies.

Urquhart M. L.

*Resources and Strategies for Building Understanding of the Earth-Moon-Sun System in Students of all Ages [#2830]*

This presentation discusses a variety of resources and strategies used in UT Dallas education and outreach programs to help learners build understanding of the Earth-Moon-Sun system including topics of scale, lunar phases, and seasons.
MARS SEDIMENT REVELATIONS:
GENESIS, CHRONICLES, AND LANDING SITE LAMIN(T)ATIONS
Wednesday, 8:30 a.m.  Waterway Ballroom 1

Chairs: Matthew Golombek and Herbert Frey

8:30 a.m.  Golombek M. *  Grant J.  Vasavada A. R.  Grotzinger J.  Watkins M.  Kipp D.  Noe Dobrea E.  Griffes J.  Parker T.
Final Four Landing Sites for the Mars Science Laboratory [#1520]
The Mars Science Laboratory will land at Mawrth Vallis, Holden, Gale, or Eberswalde Craters (locations important to the potential habitability of Mars) after four community workshops and the consideration of more than 50 candidates over the past four years.

8:45 a.m.  Erkeling G. *  Reiss D.  Poulet F.  Carter J.  Loizeau D.  Hiesinger H.  Ivanov M. A.  Hauber E.  Jaumann R.
Morphology and Mineralogy of Libya Montes Layered Delta Deposits, Mars: Implications for Long-Term Aqueous Alteration [#2028]
We present the first results of our morphologic and mineralogic investigation of layered delta-deposits in the Libya Montes, where our observations suggest long-term availability of water and aqueous alteration.

9:00 a.m.  Irwin R. P. III *
Timing, Duration, and Hydrology of the Eberswalde Crater Paleolake, Mars [#2748]
To balance input and evaporation while maintaining its water level, the post-Noachian paleolake in Eberswalde Crater appears to have received intermittent runoff of up to 1 cm/day and 10 cm/year from its watershed over 1,000 to 10,000 years.

9:15 a.m.  McKeown N. K. *  Rice M. S.
Detailed Mineralogy of Eberswalde Crater [#2450]
Eberswalde Crater contains a fan-shaped deposit interpreted as a delta. Fe/Mg smectite and pyroxene have previously been identified within and near the deltaic deposit. Here we present a detailed mineralogical study of the delta and crater.

9:30 a.m.  Warner N. H. *  Gupta S.  Kim J.  Muller J.  Le Corre L.  Lin S.  Morley J.  McGonigle C.
Constraints on the Origin and Evolution of Iani Chaos, Mars [#1421]
We present a topographic, geomorphologic, and chronologic study of the Iani Chaos system to constrain its origin and geologic evolution (including the deposition of ILDs) as they relate to catastrophic flood events in Ares Vallis.

9:45 a.m.  Gualmini L. *  Gilmore M. S.  Harrison T. N.  Marinangeli L.
Ancient Martian Lakestands in Iani Chaos and Their Relationship to Ares Vallis Outflow Channels [#1433]
For the first time fluvial features have been identified in Iani Chaos contiguous with Ares Vallis channels. The systems erode ILD and control their elevation. ILD deposition likely occurred in lakes that were the expression of recharging aquifers.

10:00 a.m.  Kite E. S. *  Manga M.  Halevy I.
We are developing a snowmelt model of the formation and distribution of sedimentary rocks on Mars. Initial results show good correspondence between areas where snowmelt is predicted, and areas where sedimentary rocks are observed.
10:15 a.m. Cadieux S. B. * Kah L. C.
**Intracrater Layered Deposits in Arabia Terra, Mars Indicate Potential Wet, Cold, Conditions in Late Noachian-Early Hesperian [#1265]**
Intracrater layered deposits in Arabia Terra are interpreted in terms of depositional style and stratal packaging to have accumulated by episodic aqueous fluids within a dominantly frozen groundwater reservoir, consistent with a cold, early Mars.

10:30 a.m. Pondrelli M. * Rossi A. P. van Gasselt S. Le Deit L. Feuten F. Hauber E. Zegers T.
**Equatorial Layered Deposits in Arabia Terra, Mars: Facies and Process Variability [#1825]**
The Equatorial Layered Deposits in the Firsoff Crater area have been interpreted as the product of different processes and depositional environments: fluid escape and evaporite precipitation and aeolian reworking, transport, and deposition.

10:45 a.m. Wiseman S. M. * Andrews-Hanna J. C. Arvidson R. E. Mustard J. F. Zabrusky K. J.
**Distribution of Hydrated Sulfates Across Arabia Terra Using CRISM Data: Implications for Martian Hydrology [#2133]**
The detection of sulfate deposits across Arabia Terra is consistent with widespread groundwater-related processes. Mapping these exposures will allow for the reconstruction of their original extent and comparison to hydrologic model predictions.

11:00 a.m. Zabrusky K. J. * Andrews-Hanna J. C. Wiseman S. M.
**The Distribution and Depositional History of Sedimentary Deposits in Arabia Terra [#2558]**
Sedimentary deposits throughout Arabia Terra show similar characteristics to those in the Meridiani region. We show geomorphic evidence that the sediments are related, then use crater counting to estimate formation and erosion rates for the deposits.

11:15 a.m. Calef F. J. III * Herrick R. R. Sharpton V. L.
**Small Rayed Crater Ejecta Retention Age Calculated from Current Crater Production Rates on Mars [#2717]**
This research generates ejecta retention ages for small rayed craters on Mars. This is accomplished by calculating a new crater production function using measured impact rates, corrections for atmospheric filtering and for secondaries in the vicinity around Zunil.

11:30 a.m. Frey H. V. * Shi D. Y.
**Nothing Older than the Borealis Basin on Mars? [#1756]**
There is no evidence in crater retention ages that crust older than the Borealis Basin survives on Mars. The giant impact, or the later forming very large basins, or both, may have completely reset the crater retention ages everywhere on Mars.

---

**EARLY SOLAR SYSTEM RESERVOIRS AND PROCESSES I: REFRACTORY MATERIALS, ISOTOPIC ANOMALIES, AND THEIR SOLAR ORIGINS**

**Wednesday, 8:30 a.m. Waterway Ballroom 4**

**Chairs:** Denton Ebel and Justin Simon

8:30 a.m. Heber V. S. * McKeegan K. D.
**Towards Understanding Mass-Dependent Fractionation of Solar Wind Isotopic Compositions [#2789]**
The isotopic composition of the solar nebula for most highly-volatile elements is best deduced from solar wind. We show that isotopic fractionation of solar wind is basically quantifiable based on oxygen and noble gas data from Genesis.
8:45 a.m. Brennecka G. A. * Borg L. E. Wadhwa M.
Barium, Neodymium and Samarium Isotope Composition of Allende CAIs [#1302]
Ba, Nd, and Sm isotope compositions of Allende CAIs indicate r-process excesses in Ba isotopes, and
p- and r-process depletions in Nd and Sm isotopes. These compositions are clearly distinct from the
variations seen in bulk meteorites.

9:00 a.m. Akram W. M. * Schonbachler M. Williams H. M. Halliday A. N.
The Origin of Nucleosynthetic Zirconium-96 Heterogeneities in the Inner Solar System [#1908]
Nucleosynthetic anomalies in the neutron-rich isotope zirconium-96 for bulk carbonaceous chondrites
are reported, which are shown to be correlated with the presence of calcium-aluminum-rich inclusions.

9:15 a.m. Lee T. * Chen W. H. Chen J. C.
Ca-43 Isotopic Anomaly in CAI and the Astrophysical Origin of Ca Isotopes [#1828]
We have detected a 0.3 \( \epsilon \) (5 \( \sigma \)) \(^{43}\)Ca shift in five Allende CAIs, which are known to have anomalies
2–5 \( \sigma \) in \(^{48}\)Ca. Correlation between different Ca isotopes potentially could provide many insights toward
late stage evolution of massive stars.

9:30 a.m. Burkhardt C. * Kleine T. Oberli F. Pack A. Bourdon B. Wieler R.
Nucleosynthetic Mo Isotopic Anomalies in Planetary Materials as Tracers of Circumstellar
Disk Processes [#2554]
New Mo-isotopic data of CAIs, chondrites, achondrites, and iron meteorites is presented. Implications
for the distribution of nucleosynthetic carriers, genetic relations of planetary bodies, and the
homogenization of the solar nebula are discussed.

9:45 a.m. Huang S. * Farkas J. Yu G. Jacobsen S. B.
Correlated Stable Calcium Isotopic Ratio and Thulium Anomaly in Refractory Inclusions [#1925]
We report mass dependent and non-mass dependent Ca-isotopic compositions, and rare Earth element
abundances in refractory inclusions from Allende CV3 carbonaceous chondrite.

10:00 a.m. Harries D. * Berg T. Palme H. Langenhorst F.
The Structure of Refractory Metal Alloys, Condensates from the Early Solar Nebula [#1837]
We present FIB-TEM investigations on the structural state of ultrarefractory Os-Ir-Mo-Ru alloys
retrieved from acid resistant residues of the Murchison meteorite. Our results support direct
condensation from the solar nebula into a single hcp alloy.

Forsterite-Bearing Type B Refractory Inclusions: Evolution from Aggregates to Volatilized
Melt Droplets [#2312]
Here, we demonstrate how chemical, mineralogical, and isotopic patterns show a well-defined
evolutionary sequence among the forsterite-bearing Type B CAIs — an unusual group of
refractory inclusions.

10:30 a.m. Frank D. * Zolensky M. Martinez J. Mikouchi T. Ohsumi K. Hagiya K. Satake W. Le L. Ross D. Peslier A.
A CAI in the Ivuna CI1 Chondrite [#2785]
We report mineralogical details for the first well-preserved CAI found in a CI1 chondrite, draw a
comparison to other CAIs, and discuss possible implications.
10:45 a.m.  Paque J. M. *  Burnett D. S.  Beckett J. R.  Guan Y.
Refractory Lithophile Element Concentrations in Melilite from a Type B1 CAI: The Role of Relict Phases [#2096]
Refractory lithophile-element concentrations in melilite from the Leoville Type B1 Ca-Al-rich inclusion 3537-2 cannot be explained by fractional crystallization but are almost certainly controlled by relict carrier phases for these elements.

11:00 a.m.  Richter F. M. *  Mendybaev R. A.  Janney P. E.  Ziegler K.  Young E.
Experimental Test of Using Si and Mg Isotopes to find the Precursor of CAI-Like Evaporation Residues [#1757]
Laboratory evaporation residues are used to test the proposition that combining the measured bulk and isotopic composition of the residues allows one to accurately determine the composition of the precursor.

11:15 a.m.  Ebel D. S. *  Richter F. M.  Young E. D.
CAI Precursor Compositions Computed from Si and Mg Isotope Measurements [#2787]
We demonstrate how original, pre-evaporation compositions of Ca-, Al-rich inclusions can be calculated from experimentally constrained parameterizations of heavy-isotope enrichment during evaporation of Mg and Si from molten precursors.

11:30 a.m.  Krot A. N. *  Nagashima K.  Bizzarro M.
Recycling of CAIs in an $^{16}$O-Depleted Reservoir: Evidence from CAIs in Metal-Rich Carbonaceous Chondrites [#1226]
We report on mineralogy, petrography, and O-isotope compositions of ~30 CAIs from the CH chondrites Acfer 182, Acfer 214, and Isheyevo, which were remelted to varying degrees in an $^{16}$O-depleted gaseous reservoir during chondrule formation.

SPECIAL SESSION: COMET HARTLEY 2 AND RELATED BODIES, IN SITU AND REMOTE I
Wednesday, 8:30 a.m.  Waterway Ballroom 5

Chairs:  Michael A’Hearn and Lori Feaga

8:30 a.m.  A’Hearn M. F. *  DIXI Science Team
Comet Hartley 2: A Different Class of Cometary Activity [#2516]
Observations of Comet Hartley 2 from the DI Flyby spacecraft show that the activity is unlike that of any comet visited thus far. Icy grains are lofted by CO$_2$ and then sublime to provide a large fraction of the water seen in the coma.

The Shape and Geological Features of Comet 103P/Hartley 2 [#1741]
The shape and geological features were determined from flyby imaging. The bi-lobed nucleus shows a different set of features from others examined at close range.

9:00 a.m.  Schultz P. H. *  Hermalyn B.  Bruck M.  A’Hearn M.  Farnham T.  Belton M. J. S.  Thomas P.  Sunshine J.  Sebastian S.
Geology of 103P/Hartley 2 and Nature of Source Regions for Jet-Like Outflows [#2382]
The DI Spacecraft Deep Impact Flyby spacecraft captured the first high-resolution views of the surface of an active comet, 103P/Hartley 2. Here we discuss the geology and structures associated with collimated jets.
9:15 a.m. Li J.-Y. * Besse S. DIXI Science Team
*Photometry of the Nucleus of Comet 103P/Hartley 2* [#2446]
We will report the results of a detailed photometric analysis for the nucleus of Comet 103P/Hartley 2 collected from the flyby of Deep Impact flyby spacecraft.

9:30 a.m. Harmon J. K. * Nolan M. C. Howell E. S. Giorgini J. D. Taylor P. A.
*Comet 103P/Hartley: Radar Observations of the Nucleus and Large-Grain Coma* [#1480]
Arecibo radar observations of Comet Hartley from October 25–31, 2010, provide data complementing the EPOXI flyby, including spin state (period, pole, etc.), surface density, and large-grain production.

9:45 a.m. Feaga L. M. * Sunshine J. M. Groussin O. Besse S. Protopapa S. Merlin F. Farnham T. L. A’Hearn M. F. DIXI Science Team
*Heterogeneity of Comet 103P/Hartley 2’s Gaseous Coma* [#2461]
Spectral data from the DIXI mission show that the distribution of H$_2$O and CO$_2$ in Hartley 2’s coma is asymmetric. We will focus on the composition and distribution of the coma around perihelion. Implications of heterogeneity will be discussed.

10:00 a.m. Sunshine J. M. * Feaga L. M. Groussin O. Besse S. Protopapa S. Merlin F. Farnham T. L. A’Hearn M. F. DIXI Science Team
*Icy Grains in Comet 103P/Hartley 2* [#2292]
Hartley 2’s coma includes µm-sized water ice grains that are spatially correlated with CO$_2$-rich jets, suggesting that CO$_2$ is dragging the ice from the nucleus. These ice grains then sublime, thus explaining the small comet’s enhanced water activity.

10:15 a.m. Hermaly B. * Schultz P. H. Farnham T. L. Bodewits D. A’Hearn M. F. DIXI Science Team
*The Detection and Location of Icy Particles Surrounding Hartley 2* [#2676]
The Deep Impact spacecraft flyby of Hartley 2 revealed a field of hundreds of discrete icy particles enveloping the comet and forming a unique near-nucleus environment. This study discusses the identification and location of these particles.

10:30 a.m. Movshovitz N. * Asphaug E.
*The Physics of Granular Flow and the Tidal Disruption of Comet Shoemaker-Levy 9* [#2652]
A new discrete element model of a rubble-pile using N-body gravity with intergranular friction and arbitrary grain shapes is used to, among other things, obtain a lower constraint on Comet Shoemaker-Levy 9’s bulk density.

10:45 a.m. Ortiz J. L. Campo Bagatin A. * Thirouin A. Duffard R. Licandro J. Richardson D. C. Santos-Sanz P. Morales N. Benavide P. G.
*How Important is Rotational Fission in the Trans-Neptunian Region?* [#2825]
We introduce the idea that rotational fission is a possible mechanism in the formation of systems of large TNOs: (binary systems, complex systems (Haumea), and TNO pairs. We also present N-body simulations of rotational fission.

11:00 a.m. Lisse C. M. * Kissel J. Melosh J. Schultz P. Kelley M. S. Farnham T. L. Groussin O. Li J. Y. Bodewits D. A’Hearn M. F. Sunshine J. DIXI Science Team
*On the Evolution of the Dust Emitted by Comet 103P/Hartley 2 and Observed by EPOXI* [#2084]
We present observations and preliminary analyses characterizing dusty material emitted by Comet 103P/Hartley 2, combining high-fidelity *in situ* optical-NIR imaging spectro-photometry and Earth-based measurements during the EPOXI flyby and the comet’s close approach to Earth.
11:15 a.m.  Economou T. E. * Dust Science Team

*Dust Investigations with Dust Flux Monitoring Instrument on Stardust-NExT Mission to Tempel 1 Comet [#2318]*

Results from the Dust Flux Monitoring Instrument (DFMI) on the STARDUST-NexT mission to Comet Tempel 1 will be presented at this conference, if successfully obtained. We expect to see results similar to the encounter with Wild 2 in 2004.

11:30 a.m.  Bruck M. A. * Schultz P. H.  A’Hearn M. F.  Belton M. J. S.  Farnham T. L.  DIXI Science Team

*Hydrodynamical Modeling of Jet Formation on Comet 103P/Hartley 2 [#2439]*

Fine-scale filamentary features imaged during the EPOXI mission flyby of Hartley 2 provide new constraints to models of collimated jet formation. Here we present work to numerically model cometary jets as constrained by observations of Hartley 2.

---

**COMPOSITION AND STRUCTURE OF THE LUNAR CRUST FROM SAMPLES AND SPECTROSCOPY**

*Wednesday, 8:30 a.m.  Waterway Ballroom 6*

**Chairs:**  Bradley Jolliff and Peter Isaacson

8:30 a.m.  Kamata S. * Sugita S.  Abe Y.  Ishihara Y.  Harada Y.  Namiki N.  Iwata T.  Hanada H.  Araki H.

*Radiogenic Heat Source Concentration in the Lunar Farside Crust Estimated from Viscoelastic Deformation of Impact Basins [#1648]*

Viscoelastic modeling of impact basins and Kaguya’s selenodetic data yield an estimate for the mean Th concentration in the lunar farside crust (<0.5 ppm), much lower than SPA, suggesting great horizontal heterogeneity of lower farside crust.


*A Mineralogical Survey of Lunar Crater Central Peaks with Moon Mineralogy Mapper Data: First Results [#2556]*

Central peak craters allow the composition of the lunar crust to be evaluated surficially and with depth. We present an overview and initial results of a study to evaluate lunar crustal composition through central peak craters with M3 data.

9:00 a.m.  Ohtake M. * Mastunaga T.  Takeda H.  Yokota Y.  Yamamoto S.  Morota T.  Ogawa Y.  Hiroi T.  Nakamura R.  Haruyama J.

*Vertical Compositional Trend Within the Lunar Highland Crust [#1169]*

We investigated spatial and vertical compositional (modal abundance) trends of these high plagioclase abundance anorthosite rocks over the entire lunar surface within the upper crust.

9:15 a.m.  Korotev R. L. * Jolliff B. L.  Carpenter P. K.

*Miller Range Feldspathic Lunar Meteorites [#1999]*

We report on the composition and petrography of four lunar meteorite stones found during the 2009–2010 ANSMET field season in the Miller Range of Antarctica and compare the new meteorites to the other feldspathic lunar meteorites from Antarctica.

---

42nd LPSC Program, Wednesday Oral Sessions  105


10:15 a.m. Dhingra D. * Pieters C. M. Boardman J. W. Head J. W. Isaacson P. J. Taylor L. A. M³ Team Theophilus Crater: Compositional Diversity and Geological Context of Mg-Spinel Bearing Central Peaks [2388] This paper reports the detection of Mg-spinel at Theophilus Crater and explores the geological context by analyzing the association of spinel with other lithologies. It is an important step toward determining the origin of this new rock type on the Moon.

10:30 a.m. Lal D. * Chauhan P. Shah R. D. Bhattacharya S. Ajai Kiran Kumar A. S. Identification of Spinel Group of Minerals on Central Peak of Crater Theophilus [1339] This paper presents the result of compositional study of the central peak of crater Theophilus using the Chandryaan-1 Moon Mineralogy Mapper (M³) and SELENE Multiband Imager (MI) data for the detection of the spinel group of minerals.

10:45 a.m. Gross J. * Treiman A. H. Le L. Unique Spinel-Rich Lithology in Lunar Meteorite ALHA81005: Origin and Possible Connection to M³ Observations of the Farside Highlands [2620] Lunar highlands breccia ALHA81005 contains a clast with 30% Mg,Al spinel, which is the most spinel-rich lunar sample reported from the Moon. It may be related to spinel-rich outcrops on the lunar farside, detected by M³.

11:00 a.m. Shafer J. T. * Brandon A. D. Lapen T. J. Peslier A. H. Irving A. J. Trace Element Geochemistry of a Lunar Granulite: Evidence from Northwest Africa 3163 [1508] Northwest Africa (NWA) 3163 is a granulitic breccia most likely from the lunar farside. NWA has among the lowest incompatible-trace-element concentrations of any known lunar sample and may be a fragment of nearly pristine lower crust.

11:30 a.m.  Bugiolacchi R. *  Mall U.  Bhatt M.

*A Near-Infrared Reflectance Survey Across Lunar Crater Aristoteles [#1067]*

Near-infrared SIR-2 data of the central section of lunar crater Aristoteles show a varied distribution of spectrally dominant mineral phases and glasses hinting at a geologically complex target site.

---

**IMPACT EXPERIMENTS**

**Wednesday, 8:30 a.m.  Montgomery Ballroom**

**Chairs:**  Mary Sue Bell and Michael Poelchau

8:30 a.m.  Fritz J. *  Wünne mann K.  Greshake A.  Fernandes V. A. S. M.  Boettger U.  Hornemann U.

*Shock Pressure Calibration for Lunar Plagioclase [#1196]*

Shock recovery experiment on Ca-rich plagioclase (An\textsubscript{94}) were performed to investigate on the mechanisms of shock deformation in silicates and to provide quantitative shock pressure calibration for lunar rocks and Ca-rich plagioclase-bearing meteorites.

8:45 a.m.  Bezaeva N. S. *  Badjukov D. D.  Raitala J.  Rochette P.  Gattacceca J.

*Experimental Shock Metamorphism of Terrestrial Basalts Induced by Shock Waves up to 115 GPa: Agglutinate-Like Particles' Formation, Petrology and Magnetism [#2826]*

We investigated particles that were found in products from high-velocity shock experiments with peak shock pressures up to 115 GPa. Texturally, the particles are similar to lunar agglutinates. The particles have specific magnetic characteristics.

9:00 a.m.  Okamoto C. *  Arakawa M.  Hasegawa S.

*Impact Experiments of Metal Core-Rocky Mantle Targets Simulating Collisonal Disruption of Iron Meteorite Parent Bodies [#2331]*

The collisional processes of differentiated bodies play an important role to clarify the origin of iron meteorites. Thus, we conducted impact experiments on metal core-silicate mantle targets simulating differentiated bodies.

9:15 a.m.  Gavin P. *  Chevrier V.  Ninagawa K.  Gucsik A.  Hasegawa S.

*Experimental Investigation into the Effects of Meteoritic Impacts on the Near- and Mid-Infrared Spectra of Martian Phyllosilicates [#1921]*

NIR and MIR spectral analysis, as well as shock pressures and temperatures reached during impact experiments, help determine whether phyllosilicates found in association with impact craters on Mars were pre-existing or were formed as a result of the impact.

9:30 a.m.  Ebert M. *  Hecht L.  Deutsch A.  Kenkmann T.

*MEMIN: Chemical Modification of Projectile Spheres, Target Melts and Shocked Quartz in Hypervelocity Impact Experiments [#1400]*

We present results of hypervelocity cratering experiments using iron meteorite as projectile and a sandstone target. The ejecta show shock features (melting, PDFs, lechatelierite) and physical as well as chemical mixing between projectile and target.

9:45 a.m.  Hoerth T. *  Schäfer F.  Thoma K.  Poelchau M.  Kenkmann T.  Deutsch A.

*Ejecta Dynamics during Hypervelocity Impacts into Dry and Wet Sandstone [#1993]*

Hypervelocity impact experiments into dry and water saturated porous Seeberger sandstone were conducted at the two-stage light gas accelerator at the Ernst-Mach-Institute (EMI) and the ejecta dynamics were analyzed.
10:00 a.m. Moser D. Grosse C. U. *

Non-Destructive Testing of the Fracture Zone Generated by Model Impacts Underneath Sandstone Craters by Means of Ultrasound and Acoustic Emission [#2493]

To give an overview about the fracture zone in impact craters, we used different geophysical-based methods. The measurements have the potential to be compared to geophysical measurements of the subsurface damage zone in terrestrial craters.

10:15 a.m. Barnouin O. S. * Ernst C. E. Heinick J. T. Sugita S. Cintala M. J. Crawford D. A. Matsui T.

Experimental Results Investigating the Impact Velocity Effects on Crater Growth and the Transient Crater Diameter-to-Depth Ratio [#2258]

We performed vertical hypervelocity impacts at the NASA Ames Vertical Gun Range to evaluate if increasing impact velocity, which alters the coupling time between the projectile and target, yields changes in the rate of crater growth and transient crater shape.

10:30 a.m. Kenkmann T. * Burgert P.

Impact Crater Collapse: First Experimental Results from Analogue Modeling Using Particle Image Strainometry [#1511]

A new experimental set-up and the application of three-dimensional particle image strainometry allows us to measure displacements, particle vectors, strain, and strain rate during the collapse of a paraboloid cavity. The experiments mimic impact crater modification.

10:45 a.m. Morris A. J. W. Price M. C. Cole M. J. Kearsley A. T. Burchell M. J. *

Cratering Efficiency in Rocks as a Function of Rock Temperature [#1943]

The effect of target temperature on the size of impact craters is reported for laboratory impacts on rocks (limestone, sandstone and hematite) using a two stage light gas gun, with target temperatures in the range 150–500 K.

11:00 a.m. Onose N. * Okudaira K. Hasegawa S.

Energy Partition into Compaction of a Target in Impact Cratering on a Gypsum Target [#1758]

Compaction of targets is one of the important candidates for redistribution of the impact generated energy. In this paper, it is estimated through a simple model to be 0.28 to 0.56 of the kinetic energy of a projectile.


Experimental Study of SO₃/SO₂ Ratio in Impact Vapor Clouds Using A High-Speed Laser Gun [#1752]

We conducted hypervelocity impact experiments using a laser gun and measured the chemical compositions of the impact-induced SOx. The result clearly shows that the sulfur oxides released by the Chicxulub impact was dominated by SO₃, not SO₂.

11:30 a.m. Ormø J. * Housen K. R. Holsapple K. A. Lepinette A. Melero Asensio I. Torres Redondo J.

Low-Velocity Experimental Impact Cratering Facility for the Study of Wet Target Impacts [#1047]

At the new experimental cratering facility at CAB impact experiments complement field observation and numerical simulation in order to use craters as indicators for paleoenvironments important as potential habitats.
MARS ALTERATION: PHYLLOSILICATES, SULFATES, AND SOILS
Wednesday, 1:30 p.m. Waterway Ballroom 1

Chairs: Janice Bishop and Elizabeth Rampe

1:30 p.m. Arvidson R. E. * Squyres S. W. Murchie S. L. Athena Science and CRISM Teams
*Mars Exploration Rover Opportunity Mission Recent Results for Meridiani Planum [#1492]*
Opportunity has been traversing the Meridiani plains since January 2004 and after reaching Santa Maria crater on December 16, 2010, had traveled over 26.5 km (based on wheel odometry). This abstract focuses on recent key scientific results.

1:45 p.m. Rampe E. B. * Kraft M. D. Sharp T. G. Golden D. C. Ming D. W. Christensen P. R. Ruff S. W.
*Detection of Allophane on Mars Through Orbital and In-Situ Thermal-Infrared Spectroscopy [#2145]*
Models of TES and Mini-TES spectra with libraries containing allophanes and gel suggest these weathering products occur in several regions of Mars. The presence of allophane indicates that weathering has proceeded under moderate pH conditions.

2:00 p.m. Brückner J. * Fleischer I. Gellert R. Klingelhöfer G.
*On the Geochemistry of Soils at Gusev Crater and Meridiani Planum, Mars: Similarities and Differences [#1702]*
The general similarity in the composition of the soils is indicating that surrounding regions have comparable compositions. Only at Meridiani, hematitic spherules occur. Similar Cl/S ratios in the soils point to a global component on Mars.

2:15 p.m. McGlynn I. O. * McSween H. Y. Fedo C. M.
*Integrating Physical and Chemical Alteration Mechanisms of Soil Formation on Mars from the Mars Exploration Rovers [#2021]*
Models of soil formation by chemical weathering must also incorporate physical processes including impact gardening and aeolian transport to remove and concentrate olivine and explain the compositional scatter of soils along the olivine-feldspar join.

2:30 p.m. Hausrath E. M. * Tu V.
*Reactive Transport Modeling of Phosphate Mobility Under Mars-Like Conditions [#2353]*
Phosphate is an important nutrient and indicator of water-rock interactions. Here we report reactive transport modeling of phosphate mobility under Mars-like conditions.

2:45 p.m. Marcucci E. C. * Hynek B. M. McCollom T. M.
*Acid-Sulfate Weathering Experiments and the Effects of Fluid:Rock Ratio: An Early Mars Analog [#1521]*
We completed a series of experiments that reacted sulfuric acid with basaltic minerals at various fluid to rock ratios to characterize the changes in secondary mineralogy and, ultimately, to provide insights into conditions on early Mars.

3:00 p.m. Goetz W. * Hecht M. H. Hviid S. F. Madsen M. B. Pike W. T. Staufer U. Velbel M. A.
*Detection of a Minor Alteration Phase in Soils at the Phoenix Landing Site, Mars [#2710]*
Microscopic images acquired during the Phoenix mission reveal the presence of small amounts of particles with unusual spectral properties (VIS/NIR). The particles cannot be identified, but appear to be neither water ice nor perchlorate.
3:15 p.m.  Tosca N. J. *  Hurowitz J. A.
Neof ormation, Diagenesis and the Clay Cycle on Early Mars [#2031]
An examination of major sources of newly formed clay on early Mars highlights major differences between clay cycles on Mars and Earth. The overall importance of each to the sedimentary “clay mineral budget” is assessed.

3:30 p.m.  Carter J. *  Poulet F.  Ody A.  Bibring J.-P.  Murchie S.
Global Distribution, Composition and Setting of Hydrous Minerals on Mars: A Reappraisal [#2593]
Global mapping of hydrated exposures on Mars based on the OMEGA and CRISM instruments has revealed over 900 sites, mostly Fe-Mg rich phyllosilicates associated with southern highland crater impact structures.

3:45 p.m.  Bishop J. L. *  Saper L.  Beyer R. A.  Lowe D.  Wray J. J.  McKeown N. K.  Parente M.
Possible Sedimentary Features in Phyllosilicate-Bearing Rocks at Mawrth Vallis, Mars [#2374]
Discordant layering in phyllosilicate deposits at Mawrth Vallis may indicate sedimentary processes. We present analyses of CRISM and HiRISE data of these features.

4:00 p.m.  Milliken R. E. *  Bristow T.  Bish D. L.
Diagenesis of Clay Minerals on Mars and Implications for the Mars Science Laboratory Rover [#2230]
Here we examine the possibility that previously reported smectite deposits on Mars may in fact represent mixed-layered clays. Implications for understanding diagenetic processes and preservation of organics on Mars will be discussed.

4:15 p.m.  Battler M. M. *  Osinski G. R.  Lim D. S. S.  Davila A. F.  Michel F. A.  Craig M. A.
Izawa M. R. M.  Leoni L.  Slater G. F.  Fairén A. G.  Starratt S. W.
The Golden Deposit in the Canadian Arctic as an Analogue for Jarosite Deposition at Meridiani Planum and Mawrth Vallis, Mars [#2759]
The Golden Deposit, in the semi-arid Arctic desert, contains jarosite precipitating from cold, acidic, microbe-hosting groundwater seeps. It is chemically similar to jarosite at Meridiani Planum and Mawrth Vallis, and thus a new depositional analog.

4:30 p.m.  Smith M. R. *  Bandfield J. L.  Gillespie A. R.
Felsic and Altered Mineral Suite in Antoniadi Crater, Mars as a Future Rover Landing Site [#1671]
We investigate Antoniadi Crater, Mars as a site for a future rover mission. It has basaltic and quartzofeldspathic rocks, along with altered minerals (hydrated silica, clays, zeolites), ideal for future geological and astrobiological investigation.

---

**EARLY SOLAR SYSTEM RESERVOIRS AND PROCESSES II: CHONDRULES AND AMOEBOID OLIVINE AGGREGATES**

**Wednesday, 1:30 p.m.  Waterway Ballroom 4**

**Chairs:**  Herbert Palme and Gerald Wasserburg

1:30 p.m.  McDonough W. F. *  Ash R. D.  Puchtel V.
Composition of Chondrules and the Assessment of Chondritic Abundances: A Planetary Perspective [#2430]
We have measured refractory trace-element ratios in chondrules from enstatite, ordinary and carbonaceous chondrites and find a high intrameteorite variability that has consequences for the modeling of planetary compositions.
1:45 p.m. Simon S. B. * Beckett J. R. Vaughan W. M. Sutton S. R. Grossman L.  
Chondrule-Composition Melts: Response of Fe and Ti Valence to Changing Redox Conditions [1271]
Chondrule-composition melts were held at 1400°C and an $fO_2$ three log units below iron-wüstite (IW-3) and cooled at IW-0.5 at 10^°–1000°C/h to investigate how readily the valences of Fe and Ti respond to changing redox conditions during crystallization.

2:00 p.m. Beckett J. R. * Ma C. Connolly H. C. Jr. Stolper E. M.  
Origin of the Refractory Component in Ferromagnesian Chondrules and Constraints on Their Thermal Histories: Clues from Glass Inclusions in Olivine from Carbonaceous Chondrites [2071]
Compositions of glass inclusions in olivine from CM, CR, and CV chondrites can be described as mixtures of Type C CAIs and SiO$_2$ that are far from olivine saturation. This places severe constraints on possible thermal histories.

2:15 p.m. Kropf A. * Libourel G.  
Gas-Melt Interaction Experiments at High Temperature and High SiO(g) Partial Pressure — Implication of Melt Composition to Chondrule Formation [1160]
We conducted new silica evaporation/condensation experiments to explore solar nebular gas-melt interaction. Olivine starting matters resulted in formation of pyroxene phases and Si-rich rims. Chondrule formation in nebular regions with high P(SiO) is supported.

2:30 p.m. Miura H. * Yokoyama E. Nagashima K. Tsukamoto K.  
Rim Formation of Barred Olivine Chondrules: Condition for Rapid Crystal Growth Along Droplet Surface [1732]
To clarify the formation mechanism of the rim of barred olivine chondrules, we analytically derive the condition of the rapid crystal growth along the droplet surface as a function of the cooling rate.

Extremely Na and Cl Rich Chondrule Al3509 from the Allende Meteorite [1147]
This Ca-Al-rich chondrule is not a replacement product. It has ~10% Na and ~1% Cl. Large excesses of $^{36}$S were found uncorrelated with Cl and $^{26}$Al/$^{27}$Al < 3 x 10^-6. It represents the fluid responsible for late alteration in volatile-rich outer layers prior to formation of Allende.

3:00 p.m. Palme H. * Hezel D. C. Klerner-Pack S.  
Element Fractionation Between Chondrules and Matrix: Clues for Chondrule Formation [1978]
Chondrules and matrix in carbonaceous chondrites (CC) are fractionated in Mg/Si and Al/Ti, in contrast to bulk CC. Chondrules and matrix are chemically complementary on a scale of a few mm, providing strong constraints for chondrule formation.

3:15 p.m. Zanda B. * Humayun M. Barrat J.-A. Bourot-Denise M. Hewins R.  
Bulk and Matrix Composition of the Paris CM. Inferences on Parent-Body Alteration and the Origin of Matrix-Chondrule Complementarity [2040]
Paris has a CM bulk chemistry (volatile depleted/refractory enriched), but ~40 vol% of it was preserved from PB-alteration. Matrix is CI in unaltered zones and closer to the bulk elsewhere. These data are consistent with the two-component model of Anders.

3:30 p.m. Asphaug E. * Jutzi M. Movshovitz N.  
Chondrule Formation by Partial Accretion of Planetesimals [1647]
We introduce a simple mechanism for ubiquitous chondrule formation during early planetary growth.
3:45 p.m. Ruzicka A. * Hutson M. Floss C.
Amoeboid Olivine Aggregate Condensates and the Origin of the Refractory Element Fractionation [#1336]
Our data support the inference that AOAs were an important fractionating constituent in the solar nebula and could have helped to establish chondrite compositions.

4:00 p.m. Han J. * Brearley A. J.
Amoeboid Olivine Aggregates from the ALHA 77307 CO3.0 Chondrite: Microstructural Constraints on the Origin of Refractory Components [#1673]
The study on AOAs from the ALHA 77307 (CO3.0) to understand the relationship between the refractory component and olivine in AOAs and interpret their origins.

4:15 p.m. Tachibana S. * Kataoka K. Takigawa A. Nagahara H. Ozawa K.
Condensation Experiments of Magnesium-Silicates Under Protosolar Disk Conditions: Growth Kinetics [#2682]
Condensation experiments of Mg-silicates were carried out under controlled protoplanetary disk-like conditions, and crystalline forsterite was obtained as condensates on the forsterite substrate. We will also discuss growth kinetics.

4:30 p.m. Petaev M. I. * Lehner S. W. Zolotov M. Buseck P. R.
The Origin of Ninigerite in EH3 Silica-Bearing Chondrules: Insights from Mineral Equilibria [#2323]
Molten metal-sulfide nodules are capable of generating sulfur fugacity high enough to shift silicate-sulfide reactions toward the stability fields of SiO2 and Mg and Ca sulfides at nominal solar nebula redox conditions.

SPECIAL SESSION: COMET HARTLEY 2 AND RELATED BODIES, IN SITU AND REMOTE II
Wednesday, 1:30 p.m. Waterway Ballroom 5

Chairs: Jessica Sunshine and Matthew Knight

1:30 p.m. Belton M. J. S. * Thomas P. Li J.-Y. Carcich B. A’Hearn M. F. Mclaughlin S. Williams J. Farnham T. McFadden L. Lisse C. Collins S. Besse S. Klaasen K. Sunshine J. Meech K. J. Lindler D.
DIXI Imaging Science Team
The Spin of 103P/Hartley 2 and Its Evolution During the EPOXI/DIXI Encounter [#1607]
We present evidence from the EPOXI/DIXI for an excited spin state for comet 103P. The results of our analysis of this data and the details our proposed spin state and its orientation in space are presented.

1:45 p.m. Meech K. J. * EPOXI Earth-Based Team EPOXI/DIXI Science Team
The EPOXI Earth-Based Observing Campaign [#1991]
We report the results from the large Earth-based observing campaign coordinated for the EPOXI mission to characterize the target comet nucleus pre-encounter, and to cover timescales, wavelength regimes, and instruments not accessible in situ.

2:00 p.m. Mueller B. E. A. * Samarasinha N. H. A’Hearn M. F. Farnham T. L. Gersch A.
CN Coma Morphology of Comet 103P/Hartley 2 During the 2010 Apparition [#2116]
We report on the CN coma morphology of comet 103P/Hartley 2 based on our ground-based observations taken between September and December 2010. Implications of the CN coma morphology for the rotation state will be discussed.
2:15 p.m. Farnham T. L. * Besse S. Feaga L. M. Sunshine J. M. A’Hearn M. F. Lindler D. Bodewits D. Lisse C. M. Belton M. J. S. DIXI Team
Jet Activity in Comet 103P/Hartley 2 as Observed by the Deep Impact Spacecraft [#2160]
We will present an analysis of the coma and jet activity in Comet Hartley 2, as observed during the approach, flyby and departure of the Deep Impact spacecraft.

2:30 p.m. Knight M. M. * Schleicher D. G.
CN Morphology of Comet 103P/Hartley 2 [#2634]
We report on CN coma morphology of Comet 103P/Hartley 2 observed from August–December 2010 at Lowell Observatory.

The Volatile Chemistry of 103P/Hartley 2 Determined from Ground-Based Infrared Measurements During the EPOXI Closest Approach [#1854]
We report the volatile chemistry of 103P/Hartley 2 on UT 4 November 2010, the night of closest approach for the EPOXI spacecraft, obtained using ground-based infrared spectroscopy.

Comet 103P/Hartley-2: Rotational and Spin Temperatures of H_2O and Evolution of Water Production Rate During the 2010 Apparition [#2419]
We will present results on rotational temperatures, spin temperatures, and the evolution of the water production rate of Comet 103P/Hartley-2 during the 2010 apparition.

Primary Volatiles During the 2010 Apparition of Comet 103P/Hartley-2 as Revealed at Infrared Wavelengths: Production Rates and Spatial Profiles [#2428]
We will present the mixing ratios for trace volatiles (C_2H_6, HCN, CH_3OH, etc.), their rotational temperatures, and their spatial distributions in the coma both along the polar jet (UT 19.5 October) and nearly orthogonal to the jet (UT 22.5 October).

3:30 p.m. Bodewits D. * Farnham T. L. Li J.-Y. Williams J. L. McFadden L. A. Sunshine J. M. A’Hearn M. F. Meech K. J. Lisse C. M. DIXI Team
Hartley 2’s Puzzling Gas Anomaly [#2138]
Between 9 and 17 Sept. 2010 Hartley 2’s outgassing of CN, increased by a factor of 7 and then slowly decreased. There was no apparent change in the reflected continuum. We will discuss the nature and probable causes of this anomaly.

3:45 p.m. Milam S. N. * Charnley S. B. Chuang Y.-L. Kuan Y.-J. Coulson I. M. Remijan A. R.
Ground-Based Centimeter, Millimeter and Submillimeter Observations of Comet 103P/Hartley 2 [#1847]
Observations have been conducted towards Comet 103P/Hartley 2 in support of NASA’s EPOXI mission. Data was obtained for numerous species, including isotopologues, complimentary to the mission, previous studies, and other observations for this comet.
4:00 p.m. McKay A. J. * Chanover N. J. Dello Russo N. Cochran A. L. Harris W. M. Morgenthaler J. P. * 
High Resolution Optical Spectroscopy of Comet 103P/ Hartley on UT Nov 4 [#1621]
We present preliminary analysis of high resolution optical spectroscopy of Comet 103P/ Hartley on UT Nov 4, just hours before the DIXI flyby of the nucleus. We report the detection of CN, CH, C₃, C₂, and NH₂ in the coma of 103P/ Hartley.

WISE Observations of Comets, Centaurs, and Scattered Disk Objects [#1222]
The Wide-Field Infrared Survey Explorer (WISE) was launched on December 14, 2009, and imaged more than 99% of the sky in the mid-IR. WISE observed over 120 comets and 20 SDOs and Centaurs; we will review the preliminary results from these observations.

4:30 p.m. Walker R. G. * Bauer J. M. Cutri R. Masci F. Mainzer A. K. Wright E. L. WISE Team 
Wide-Field Infrared Survey Explorer (WISE) Observations of Comet 65P/Gunn [#2799]
This paper discusses observations of the short period comet 65P/Gunn. The comet exhibits a bright coma and tail structure, and a narrow trail of debris both leading and following it in its orbit.

MARE BASALTS FROM SOURCE TO ERUPTION
Wednesday, 1:30 p.m. Waterway Ballroom 6

Chairs: Clive Neal and Penny King

1:30 p.m. Gaffney A. M. * Borg L. E. Williams R. W. 
Combined Hf-Nd-Sr Isotopic Constraints on the Mineralogical Characteristics of Mare Basalt Sources [#1337]
New Hf-Nd-Sr isotopic results for mare basalts provide constraints on the long-term Lu/Hf, Sm/Nd, and Rb/Sr characteristics of the basalt sources.

1:45 p.m. Muirhead A. C. * Zhong S. 
Spatial Correlation of Deep Moonquakes and Mare Basalts and Implications for Lunar Present-Day Mantle Structure, Magmatism and Thermal Evolution [#1089]
We have correlated the presence of mare basalts deep moonquake (DMQ) clusters. We also quantify the relationship between mare basalts and topographic lows. Given our results, we propose that the DMQ are occurring predominantly in the source region of the mare basalts.

2:00 p.m. O’Sullivan K. M. * Neal C. R. Simonetti A. 
Crystal Stratigraphy of Apollo 12 Basalts [#2172]
We use crystal stratigraphy to explore the petrogenesis of the Apollo 12 ilmenite, pigeonite, and feldspathic suite basalts.

2:15 p.m. Snape J. F. * Crawford I. A. Joy K. H. Burgess R. 
A Petrographic Study of Basaltic Fragments in Apollo Regolith Sample 12003 [#2020]
We have performed a petrological study of a selection of Apollo 12 basaltic regolith grains. Based on our results we have identified four separate basaltic groups that we believe may have originated from multiple lava flows.
Using Thermal Infrared Spectroscopy of Glasses to Unravel Composition and Thermal History — A New Thermometer for Lunar Glass Beads? [#2069]
The SiO\textsubscript{2} content and thermal history of glasses is recorded in the reflectance infrared band position at ~10 \textmu m. We discuss using the band position to determine the last temperature that lunar pyroclastic glasses experienced.

Remote Analysis of Lunar Pyroclastic Glass Deposits by LRO Diviner [#1512]
LRO Diviner compositional data are closely correlated with FeO abundance across the full range of Apollo soils and pyroclastic glasses. These data have the potential to provide remote analyses of previously unsampled lunar pyroclastic deposits.

Observation of Stratified Ejecta Blocks at Aristarchus Crater [#2262]
Large blocks of Aristarchus Crater ejecta show alternating layers of bright and dark material. The blocks are only observed on the mare side of the impact crater and are interpreted to be flood basalt sequences.

Lunar Pits: Sublunarean Voids and the Nature of Mare Emplacement [#2771]
The LROC Narrow Angle Camera was used to image three pit features within lunar maria from both nadir and off-nadir slews, enabling the direct imaging of a sublunarean void.

Crater Size-Frequency Distribution Measurements of Mare Crisium [#2179]
We present new absolute model ages of mare basalts in Mare Crisium based on crater size-frequency distribution measurements performed on LROC WAC images.

Volcanism in the Orientale Basin: A Comparison to Other Nearside Lunar Basins [#2245]
M\textsuperscript{3} data are used to characterize volcanic features in Orientale basin, including model ages, areas, and volumes. Orientale results are compared with other researchers’ work to identify similarities and differences between the various lunar basins.

Modeling Affects of Lunar Surface Slope, Temperature, and Material Properties on the Efficiency of Erosion During the Formation of Rima Prinz [#1176]
Analytical models are used to determine relative roles of mechanical and thermal erosion in the formation of lunar sinuous rilles. Variations in surface slope, temperature, and material properties are explored to simulate the formation of Rima Prinz.

Large Shield Volcanoes on the Moon [#1367]
Altimetry from LOLA reveals that almost all volcanic complexes in the lunar maria occur on topographic swells, tens to hundreds of kilometers in extent and several kilometers high. We propose that these swells are shield volcanoes, equivalent to large basaltic shields found on Earth, Mars, and Venus.
4:30 p.m.  Antonenko I. *  Osinski G. R.
*Unravelling the Volcanic History of South Pole-Aitken Basin* [#2649]
Fusion of multiple 1-km/pixel datasets is used to study regional volcanic units in the South Pole-Aitken Basin. Preliminary results include identification of 83 possible basalt-excavating craters (>5 km diameter) and potential unmapped surface maria.

---

**VENUS: ATMOSPHERE, SURFACE, AND INTERIOR**
**Wednesday, 1:30 p.m.  Montgomery Ballroom**

**Chairs:**  Suzanne Smrekar and Martha Gilmore

1:30 p.m.  McCanta M. C. *  Dyar M. D.  Elkins-Tanton L. T.  Treiman A. H.
*Weathering of Hawaiian Basalts Under Sulfur-Rich Conditions: Applications to Understanding Surface-Atmosphere Interactions on Venus* [#1396]
We present data on basalts weathered under high-SO₂ conditions from Hawaii as a terrestrial analog for surface conditions on Venus. The chemistry of these samples is used as a demonstration of how basalt alteration may proceed in an SO₂-rich atmosphere.

1:45 p.m.  Berger G. *  Aigouy T.
*Experimental Rocks Alteration Under Venus-Like Conditions* [#1660]
Reactions between volcanic rocks and 95 bars CO₂ were experimented at 470°C. H₂O were added to model a wet volcanic event. Results suggest that secondary hydrated minerals, even metastable, can easily form and may persist at Venus surface.

2:00 p.m.  Treiman A. H. *  Bullock M. A.
*Atmospheres of Venus-like Planets: Stability Constraints on Mineral Reaction Buffers* [#2146]
The composition of Venus’ atmosphere (and those of similar exoplanets) might be buffered by chemical reactions with surface materials. However, many such reactions cannot act as buffers in an atmosphere that follows a dry adiabatic lapse rate.

2:15 p.m.  Smrekar S. E. *  Sotin C.
*Numerical Simulations of Mantle Plumes on Venus: Implications for Mantle Viscosity, Water Content, and Melting* [#2689]
We simulate the number of hot mantle plumes in a three-dimensional cubed sphere geometry. We find a relatively low viscosity mantle, with only wet melting, is most consistent with the number of deep plumes, lithospheric thickness, and estimated internal heating.

2:30 p.m.  Höink T. *  O’Neill C.  Lenardic A.
*Tectonic Modes and Atmospheric Argon on Venus and Earth* [#2177]
Differences in tectonic histories of Venus and Earth result from different convective stresses and can be understood with melting and degassing models constrained by the atmospheric abundance of radiogenic argon.

*Analysis of the Venus Surface Thermal Emission Images Taken by the VMC Camera, Venus Express* [#1280]
Chimon-mana Tessera and Tuulikki Mons volcano summit may have higher IR emissivity in comparison to surrounding regional plains, which can be interpreted in different ways.
3:00 p.m. Gilmore M. S. * Mueller N. Helbert J.

*VIRTIS Emissivity of Alpha Regio Tessera, Venus* [#1498]

One-micrometer emissivity of Alpha tessera is less than that of the undeformed and deformed volcanic plains. The tessera emissivity values are consistent with felsic mineralogies or mafic mineralogies that have undergone a different geologic history.

---

**SHOCKED MINERAL GRAINS: RECORDERS OF IMPACTS**

**Wednesday, 3:30 p.m.  Montgomery Ballroom**

**Chairs:** Aaron Cavosie and Matthew Wielicki

3:30 p.m. Abramov O. * Kring D. A. Mojzsis S. J.

*Modeling of Impact-Induced Age Resetting and Partial Pb-Loss in Zircon Grains* [#2674]

This study explores impact conditions under which zircons in the target may undergo complete or partial Pb-loss. The models presented here suggest either complete Pb-loss or none at all, within most impact craters and ejecta blankets.

3:45 p.m. Wielicki M. M. * Harrison T. M.

*Ti-in-Zircon Thermometry and Trace Element Geochemistry of Impact Produced Zircons: Implications for Hadean Zircons* [#2346]

We present Ti-in-zircon thermometry and trace-element geochemistry of zircons isolated from preserved terrestrial impact melt sheets to better constrain the role of impacts in the formation of the Hadean zircons from Western Australia.

4:00 p.m. Wartho J-A. * van Soest M. C. King D. T. Petruny L. W. Hodges K. V.

*An (U-He)/He Geochronological Age for the Shallow-Marine Wetumpka Impact Structure, Alabama, USA* [#1524]

This (U-He)/He study yields the first geochronological age of 84.4 ± 1.4 Ma (2σ) for the ~7.6-km-diameter Wetumpka impact structure. This age is within error of the Campanian-Santonian stratigraphic boundary age previously suggested for Wetumpka.


*New Zircon Shock Phenomenon for Dating and Reconstruction of Large Impact Basins Revealed by Electron Nanobeam (EBSD, CL, EDS), U-Pb, and (U-He)/He Isotopic Analysis of the Vredefort Dome* [#2462]

We present new microstructural (EBSD, CL), U-Pb, and (U-He)/He isotopic data on zircon microcrystals from bedrock across ~65 km radial distance of the deeply eroded collar and central uplift of the 2.020-Ga Vredefort impact basin of South Africa.

4:30 p.m. Cavosie A. J. * Moser D. E. Barker I. Radovan H. A. Wooden J.

*A 3.0 Gyr Geologic History of the Vredefort Impact Basin Recorded in a Single Grain of Sand* [#2192]

We describe a single detrital shocked zircon from modern sand that records a 3 Ga history of the evolution of the giant Vredefort Dome impact basin. This result highlights the importance of detrital mineral records for reconstructing ancient impact events.
4:45 p.m. Erickson T. M. * Cavosie A. J. Radovan H. A. Moser D. E. Wooden J.  
Microstructural and Isotopic Constraints on Impact Basin Provenance of Detrital Shocked Minerals in the Vaal River, South Africa [#2208]  
We present in situ U-Th-Pb geochronology that confirms the Vredefort Dome as the origin of detrital shocked zircon found in modern sediments of the Vaal River at distal locations (>750 km) from the impact structure.

5:00 p.m. Cintrón N. O. * Cavosie A. J. Gibbon R. J. Radovan H. A. Moser D. E. Wooden J.  
In Situ U-Th-Pb Geochronology of Detrital Shocked Monazite in Pleistocene Fluvial Deposits Along the Vaal River, South Africa [#2253]  
Here we report microstructural and in situ U-Th-Pb age data for detrital shocked monazite grains found in a Pleistocene (ca. 1.6 Ma) fluvial deposit near Windsorton South Africa, 500 km downstream from the Vredefort Dome.
EXOBIOLOGY I: HABITABILITY OF MARS
Thursday, 8:30 a.m. Waterway Ballroom 1

Chairs: Jack Farmer and Alian Wang

8:30 a.m. Farmer J. D. * Nunez J. I. Sellar R. G. Gardner P. B.
A Petrologic Approach to Assessing Ancient Habitability of Mars at the Microscale [#1544]
We highlight a petrologically based approach based on multispectral microscopic imaging and thin section petrography, to explore for evidence of microscale habitable zones on Mars, focusing on terrestrial hydrothermal deposits as compositional and process analogs.

8:45 a.m. Hurowitz J. A. * Tosca N. J. Fischer W. W.
The Geochemistry and Habitability of Martian Aquifers: A Modeling Approach [#2536]
Reactive transport modeling is used to assess the geochemical and mineralogical properties, and habitability, of aquifer systems along simulated groundwater flow paths through the shallow martian subsurface.

9:00 a.m. Wang A. * Zheng M. P. Kong F. J. Ling Z. C. Kong W. G. Sobron P. Jolliff B. L.
A Low T, High RH, and Potentially Life-Friendly Environment Within the Martian Salt-Rich Subsurface in Equatorial Regions [#2049]
Hydrated sulfates found in the subsurface at Gusev and at saline playa on the Tibet Plateau imply a high RH environment, supported by lab studies. A high-RH, salt-rich subsurface can accommodate organisms, e.g., halophiles in the Tibet saline playa.

9:15 a.m. Wilson S. A. * Bish D. L.
Formation of Gypsum and Bassanite by Solid-State Mineral Reactions: Implications for the Bioavailability of Water on Mars [#1327]
Solid-state reactions can occur within mixtures of hydrous minerals under conditions of varying relative humidity similar to those at or just beneath the surface of Mars. These reactions may mobilize H₂O and nutrients within the martian regolith.

9:30 a.m. Renno N. O. * Mehta M.
Spectral Evidence for Liquid Water on Mars [#1537]
We show new spectral evidence that liquid saline water currently forms temporarily on Mars. This is important for exobiology because a diverse array of terrestrial microorganisms thrive in brines.

9:45 a.m. Quinn R. C. * Grunthaner P. J. Taylor C. L. Bryson C. E. Grunthaner F. J.
The Radiolytic Decomposition of Soil Perchlorates on Mars [#2003]
Our results indicate that on Mars, ionizing radiation will decompose soil perchlorates to form reactive oxyhalide and oxygen species that are likely responsible for the release of O₂ in the Viking GEx experiment and the decomposition of organics in the Viking LR experiment.
10:00 a.m.  Gaidos E. *  Thorsteinsson Th.  Wade N.  Marteinsson V.  Stefansson A.
Exploring Icelandic Subglacial Volcanoes as Analogs to Habitats on Mars [#1446]
Since 2002 we have studied Icelandic volcanic subglacial lakes. The objectives of our studies are to
describe the microbial communities in these environments, determine their sources of energy and
nutrients, and evaluate potential biomarkers for application on Mars.

EXOBIOLGY II: BIOMARKERS, BUILDING BLOCKS, AND BACTERIA
Thursday, 10:30 a.m.  Waterway Ballroom 1

Chairs:  George Cooper and John Parnell

10:30 a.m.  Cooper G. *  Reed C.  Nguyen D.  Carter M.  Wang Y.
Citric Acid, Pyruvic Acid, Homologs, and Related Compounds in Carbonaceous Meteorites [#1279]
We report three new classes of meteoritic organic compounds: keto acids, hydroxy tricarboxylic acids,
and tricarboxylic acids. Some of the compounds, such as pyruvic acid and citric acid, are at the core of
intermediary metabolism.

10:45 a.m.  Zellner N. E. B. *  McCaffrey V. P.  Bennett E.  Gudipati M.
Chemistry and Astrochemistry of Simple Sugars: Implications for Asteroid, Meteorite, or
Comet Delivery [#1586]
We are presenting results of our studies of simple two- and three-carbon molecules and how their
chemistry may be affected by impact events.

11:00 a.m.  Burton A. S. *  Glavin D. P.  Callahan M. P.  Dworkin J. P.  Jenniskens P.  Shaddad M. H.
Extraterrestrial Amino Acids in Ureilites Including Almahata Sitta [#2815]
Extraterrestrial amino acids were detected in meteorites.

Spectroscopy of Mineral Reaction Products from Bioreduction by Hyperthermophiles: Potential for
Remote-Sensing Biomarkers [#1375]
We report here results of Mössbauer and infrared spectroscopies and X-ray diffraction (XRD) studies of
oxide reaction products of hyperthermophilic archaea Pyrobaculum islandicum, Hyperthermus
butylicus, and Hyperthermus strain Ro04.

11:30 a.m.  Marnocha C. L. *  Dixon J. C.
Bacterial Diversity of Sulfate Rock Coatings in Kärkevagge, Swedish Lapland: A Potential Mars Analog [#1598]
We have analyzed the bacterial diversity of sulfate rock coatings from a possible martian analog in
order to examine the microbe-mineral interactions of rock coatings and their potential as biosignatures.

11:45 a.m.  Parnell J. *  Boyce A. J.  Osinski G. R.  Izawa M.  Lee P.
Searching for Life in the Sulfur Isotopic Analysis of Surface Sulfates on Mars [#1023]
Sulfur isotopic measurements on Mars are likely to be limited to sulfates due to oxidation of sulfides.
We show that evidence for life can be determined from sulfate data alone, using an analogue for a
robotic traverse.
SPECIAL SESSION: RESULTS FROM HAYABUSA!

Thursday, 8:30 a.m.  Waterway Ballroom 4

Chairs: Takahiro Hiroi and Tomoki Nakamura


_Preliminary Examination of Particles Recovered from the Surface of the Asteroid 25143 Itokawa by the Hayabusa Mission [#1788]_

Particles of $\sim 100 \mu m$ were recovered from the surface of the asteroid Itokawa by the Hayabusa mission. Preliminary examination of these particles will start from January 2011. The outline of the examination and results will be presented.


_Processes to Open the Container and the Sample Catcher of the Hayabusa Returned Capsule in the Planetary Material Sample Curation Facility of JAXA [#1829]_

Processes in the curation facility of the container and the sample catcher in the reentry capsule of the Japanese spacecraft Hayabusa, which returned from near-Earth asteroid Itokawa to the Earth on June 13, 2010, is presented here.


_Mineralogy and Major Element Abundance of the Dust Particles Recovered from Muses-C Regio on the Asteroid Itokawa [#1766]_

Mineralogy, mineral chemistry, and micro-textures of the Itokawa particles are characterized using synchrotron radiation X-ray diffraction and transmission and field-emission electron microscopes.


_Three-Dimensional Structures of Particles Recovered from the Asteroid Itokawa by the Hayabusa Mission and a Role of X-Ray Microtomography in the Preliminary Examination [#1777]_

Three-dimensional structures of particles of regolith on the asteroid Itokawa will be examined by microtomography as a part of the preliminary examination, which began in January 2011. A role of the tomography in the examination will be also presented.


_Neutron Activation Analysis of Single Grains Recovered by the Hayabusa Spacecraft [#1902]_

Single grain samples returned by the Hayabusa spacecraft are analyzed by neutron activation for characterizing the material in terms of chemical composition. Gamma ray counting is performed by using a well-type Ge detector at the heavily shielded counting facility.

10:00 a.m.  Noguchi T. * Nakamura T. Kimura M. Zolensky M. E. Tanaka M. Hashimoto T. Konno M. Nakato A. Ogami T. Fujimura A. Abe M. Yada T. Ueno M. Okada T. Shirai K. Ishibashi Y. Okazaki R. SEM and TEM Observation of the Surfaces of the Fine-Grained Particles Retrieved from the MUSES-C Region on the Asteroid 25413 Itokawa [1596] As a part of the initial analysis of the particles retrieved from the asteroid Itokawa by the Hayabusa spacecraft, we are performing SEM and TEM observation of the surfaces of the particles to identify the cause of the asteroidal space weathering.

10:15 a.m.  Okazaki R. * Nagao K. Miura Y. N. Osawa T. Bago K. Matsuda S. Nakamura T. Shirai K. Abe M. Yada T. Noguchi T. Ishibashi Y. Fujimura A. Mukai T. Ueno M. Okada T. Yoshikawa M. Kawaguchi J. Noble Gases Recovered from the Hayabusa Sample Container [1653] The Hayabusa sample capsule was successfully recovered on the earth in 2010. The sample container was recovered from the capsule and opened in a clean chamber at the curation facility of JAXA. Noble gases collected from the container have been investigated.


11:15 a.m. Hiroi T. * Sasaki S. Noble S. K. Pieters C. M.
Space Weathering of Ordinary Chondrite Parent Bodies, its Impact on the Method of Distinguishing H, L, and LL Types, and Implications for Itokawa Samples Returned by the Hayabusa Mission [#1264]
A new space weathering index is found useful for ordinary chondrites. Three band strength ratio method using only the 1-µm band of reflectance spectrum is less subject to space weathering than the BAR method in distinguishing H, L, and LL types.

11:30 a.m. Hirata N. * Ishiguro M.
Properties and Possible Origin of Black Boulders on the Asteroid Itokawa [#1821]
A large and very black boulder is found on the head region of the asteroid Itokawa. Nature and possible origin of the boulder are discussed.

PLANETARY DYNAMICS AND TECTONICS
Thursday, 8:30 a.m. Waterway Ballroom 5

<table>
<thead>
<tr>
<th>Time</th>
<th>Authors/Names</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 a.m.</td>
<td>Monteux J. * Jellinek M. Johnson C. L.</td>
<td>Core Merging After the Martian Giant Impact [#1665] We explore a possible link between the giant impact that formed the martian dichotomy and the initiation or modulation of a core dynamo. We characterize the dynamics of core merging and investigate how this process might influence the dynamo action.</td>
</tr>
<tr>
<td>8:45 a.m.</td>
<td>Bierhaus M. * Wünemann K. Elbeshausen D. Collins G. S.</td>
<td>Numerical Modeling of Basin Forming Impacts on Mars: Implications for the Heat Budget of Planetary Interior [#2128] We present dynamic numerical models of giant collision events to quantify the amount of heat that is deposited into a planet by an impact process. We focus on scenarios for impacts forming Hellas-sized basins on a Mars-like planet.</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>Zhong S. J. *</td>
<td>A Critical Assessment of Models for Martian Crustal Dichotomy Based on Crustal Production and Re-Distribution and Crustal Magnetization [#2563] To test giant impact and mantle flow models for the crustal dichotomy, I show that it is necessary to consider crustal redistribution processes including crustal flow and magnetic lineation and its relation to crustal production.</td>
</tr>
<tr>
<td>9:15 a.m.</td>
<td>Grott M. * Wieczorek M. A.</td>
<td>Elastic Thickness, Paleo Heat Flow, and Curie Depth at the Tyrrhena Patera Highland Volcano [#1750] Admittance modeling of the Tyrrhena Patera highland volcano indicates substantial surface heat flows between 26 and 82 mW/m² at the time of load emplacement, compatible with Curie depths of 9–29, 15–48, and 17–56 km for pyrrhotite, magnetite, and hematite, respectively.</td>
</tr>
<tr>
<td>9:30 a.m.</td>
<td>Kiefer W. S. * Lillis R. J.</td>
<td>Geophysical Observations of Hadriaca Patera and Tyrrhena Patera, Mars: Implications for Magma Chamber Structure and for the End of the Martian Magnetic Dynamo [#1662] Gravity and magnetic observations help constrain the structure and evolution of the magma chambers at these volcanos. The Mars magnetic dynamo may have survived at least briefly beyond the end of the impact basin bombardment era on Mars.</td>
</tr>
</tbody>
</table>
9:45 a.m.  Grosfils E. B. *

*New Mechanical Insights into Ring Fault Initiation and Caldera Formation on Terrestrial Planets [#1170]*

Resolving a common flaw in numerical models of ring fault (hence caldera) formation (1) leads to a new understanding of where/why ring faults can form, and (2) reconciles long-standing differences between analogue and numerical model results.

10:00 a.m.  Wyrick D. Y. * Morris A. P.  Ferrill D. A.

*Analog Modeling of Normal Fault Growth on Mars [#1536]*

Physical analog modeling and analyses of martian fault systems support the interpretation that simple faults on Mars do not grow in a self-similar manner and that compound fault systems develop in a stepwise pattern in Dmax/L space.

10:15 a.m.  Andrews-Hanna J. C. *

*The Formation of Valles Marineris, Mars [#2182]*

A sequence of events is proposed to explain the formation of Valles Marineris. A combination of volcanic loading, flexure, igneous intrusions, subsidence of super-isostatic blocks, and sedimentary loading explains the salient features of the troughs.

10:30 a.m.  Yin A. *

*Structural Analysis of the Southern Valles Marineris Trough Zones and Implications for Large-Scale Left-Slip Faulting on Mars [#1529]*

Photogeologic mapping across Ius and Coprates Chasmata has revealed the wide occurrence of northwest-trending folds, east-striking left-slip faults, and northeast-trending joints and normal faults. This observation is consistent with left-slip motion on trough-bounding faults.

10:45 a.m.  Anderson R. C. *  Dohm J. M.

*Unraveling the Complex History of Faulting for the Terra Sirenum Region; Mars [#2221]*

Mapping the Terra Sirenum region is vital to understanding the geologic and tectonic histories of Mars. We are constructing a 1:5,000,000-scale geologic map of the region detailing the stratigraphic and crosscutting relations of units and structures.

11:00 a.m.  Melosh H. J. *  Nimmo F.

*Long-Term Strength of Icy vs Silicate Planetary Bodies [#2306]*

Topography on small planetary-scale bodies is supported by frictional strength, while on large planets it is limited by plastic yielding. The plastic, but not the frictional, strength of icy bodies is about 10× smaller than that of silicate planets.

11:15 a.m.  Radebaugh J. *  Schleiffarth K.  Christiansen E. H.

*Internal Stresses of Io are Revealed by Surface Lineations [#2755]*

Lineations of mountains and paterae on Io indicate internal stress directions. The maxima in orientations at 45° and 135° indicate stresses that are parallel and perpendicular to these directions.
11:30 a.m.  Bills B. G. * Newman W. I.

_Influence of Tidal Dissipation upon Co-Precessing Spin and Orbit Poles [1151]

Tidal energy dissipation has an influence upon the orientation of the spin pole of a satellite or planet, relative to its orbit pole. We examine several cases in which dissipation rates may be high enough to have measurable effect.

---

**PLANETARY DIFFERENTIATION: CORES AND MANTLES**

_Thursday, 8:30 a.m.  Waterway Ballroom 6_

**Chairs:** Jie Li and Nachiketa Rai

8:30 a.m.  Rubie D. C. * O’Brien D. P. Nimmo F. Morbidelli A. Frost D. J. Palme H.

_Heterogeneous Accretion of the Terrestrial Planets [1061]

A multistage core formation model, that requires the Earth to have accreted heterogeneously, is integrated with N-body accretion simulations to show that the compositions of planetary mantles vary systematically with heliocentric distance.

8:45 a.m.  Righter K. * Pando K. Humayun M. Danielson L.

_High Pressure and Temperature Core Formation as an Alternative to the “Late Veneer” Hypothesis [2373]

New high-PT experimental data for highly siderophile elements (HSE) will be combined with published HSE data to show that they can be explained in Earth’s mantle by core formation and metal-silicate equilibrium. The late veneer is unlikely to survive this heavy bombardment.

9:00 a.m.  Li J. * Chen B. Leinenweber K. Wang Y.

_Rapid Core Formation Through Diapirism from High-Pressure X-Ray Radiography [2219]

High-pressure X-ray radiographs show iron-rich diapir sinking through solid olivine/wadsleyite layer at the rate of thousands of km per million years, supporting diapirism as a viable mechanism for rapid core formation.

9:15 a.m.  Van Orman J. A. * Hayden L. A.

_A Model for Trace Element Partitioning in Metallic Systems Containing Multiple Light Elements [2367]

We present a new parameterization for trace element partitioning in iron alloys that fits available experimental data for >20 trace elements in systems containing S, C, and/or P.

9:30 a.m.  Mikhail S. * Shahar A. Hunt S. A. Jones A. P. Verchovsky A. B.

_An Experimental Investigation of the Pressure Effect on Stable Isotope Fractionation at High Temperature; Implications for Mantle Processes and Core Formation in Celestial Bodies from 1 GPa and Up to 25 Gpa [1376]

We show how the stable isotope ratios observed in primary mantle minerals from celestial bodies may not reflect their source composition and how during core formation the depth of equilibration can play a major role in fractionation up to 25 GPa.

9:45 a.m.  Scott E. R. D. * Goldstein J. I. Yang J.

_Thermal, Shock, and Impact History of Group IVA and Other Iron Meteorites and Their Parent Asteroids [2498]

From TEM studies of six reheated irons and diverse shock and thermal constraints, we divide IVA irons into four progressive stages of shock and reheating probably caused by destruction of their metallic parent body within 10–20 Ma of CAI formation.
10:00 a.m. Chabot N. L. * Humayun M.
_Exploring the Influence of Oxygen on Partitioning in the Fe-S-O System_ [#1590]
Oxygen is an important “light element” in planetary differentiation processes, but data examining its effect on partitioning are lacking. We present first results from an experimental study to determine the effect of oxygen on partitioning behavior.

10:15 a.m. Hillgren V. J. * Ash R. McDonough W. F. Fei Y. Chabot N. L.
_Solid Metal/Liquid Metal Partitioning of Trace Elements at 14 GPa_ [#2360]
We present the results of a LA-ICPMS study of the solid metal/liquid metal partitioning of a large suite of elements at 14 GPa for metallic liquids with a range of S contents.

10:30 a.m. Rai N. * Ghosh S. K. van Westrenen W.
_Effect of Solid Metal Composition on Solid Metal/Liquid Metal Partitioning of Trace Elements_ [#1680]
We present results from experiments in the Fe-S system at pressures between 0.5 and 3 GPa and show that structure of the solid metal has a significant effect on solid metal/ molten metal partitioning of elements.

10:45 a.m. Burkemper L. K. * Agee C. B. Garcia K. A.
_Compositional Effects on Molybdenum Metal-Silicate Partition Coefficients at High Pressure_ [#1496]
Molybdenum metal-silicate partition coefficients were calculated from experiments on seven different silicate compositions over a pressure range of 2.5–9.7 GPa and a temperature range of 1585°C–2100°C. The implications of the results for core formation are then discussed.

11:00 a.m. Colson R. O. *
_Incompatibility of Ni in Olivine at Low fO2 and Consideration of Solubility of Neutral Nickel_ [#2491]
New experiments show partition coefficients for Ni between olivine and melt to be less than 1 (incompatible) at temperatures above 1500°C and at low fO2. These low partition coefficients are likely related to neutral Ni in the melt.

11:15 a.m. Pommier A. * Grove T. L.
_Investigation of H2O Storage and Hydrous Melting of the Early Martian Mantle_ [#1071]
We present the solidus and near-solidus phase relations experiments performed on a water-saturated martian mantle composition using a multi-anvil apparatus (P = 5–7 GPa, T = 700°C–1000°C). Results show an important storage capacity of the martian mantle.

11:30 a.m. Gardner-Vandy K. G. * Lauretta D. S.
_Experimental Partial Melting of the MacAlpine Hills 02453 (CK5) Chondrite_ [#1935]
We perform partial melting experiments of CK chondrite MAC 02453 in a Deltech vertical tube furnace at 1150°C and 1250°C and oxygen fugacities of IW-1 and IW+1. We relate our results to the formation of FeO-rich primitive achondrites.

BRINES, GULLIES, AND THE CRYOSPHERE
Thursday, 1:30 p.m. Waterway Ballroom 1

Chairs: Serina Diniega and Joseph Levy

1:30 p.m. McEwen A. * Ojha L. Dundas C. Mattson S. Byrne S. Wray J. Cull S. Murchie S.
_Transient Slope Lineae: Evidence for Summertime Briny Flows on Mars?_ [#2314]
TSL form on equator-facing rocky slopes in southern summer from latitudes –32 to –48. This distribution, incremental formation and fading, and associated morphologies and mineralogies suggest the flow of brines.
1:45 p.m. Capitan R. D. * Osinski G. R. Van De Wiel M.
Martian “Gullies”: A Morphological and Morphometrical (Re-)Classification of Processes on Crater Walls in Eastern Utopia Planitia, Mars [#1761]
In this presentation we show that the mechanisms of formation and terminology to describe gully and debris flow erosion within crater walls on Mars can be revisited and better constrained using the morphological indicators and morphometrical descriptors of these landforms.

2:00 p.m. Levy J. S. * Fountain A. G.
“Water Tracks” in the McMurdo Dry Valleys, Antarctica: A Permafrost-Based Hydrological System Supporting Complex Biological and Geochemical Processes in a Mars-Analog Environment [#1210]
Water tracks are shallow subsurface water/brine conduits typical of permafrost-dominated hydrological systems on Earth. They may represent a major water transport pathway that has been active in association with more recognizable fluvial processes throughout martian history.

2:15 p.m. Dickson J. L. * Head J. W.
The Role of Perennial Snow and Ice Deposits in McMurdo Dry Valley Gullies from High-Frequency, Long-Duration Time-Lapse Photography: Lessons for Mars [#1252]
Time-lapse photography is used over multiple seasons to document peak summer melting of perennial alcove snowbanks in the McMurdo Dry Valleys of Antarctica. Implications for recent fluvial activity on Mars are discussed.

2:30 p.m. Diniega S. * Byrne S. Dundas C. M. McEwen A. S. Bridges N. T.
Present-Day Martian Dune Gully Formation [#1540]
Over the recent Mars winter season, we closely monitored three active martian dune gullies. We are now beginning to quantitatively understand the sequence, timing, and types of present-day dune-gully formation and modification processes.

2:45 p.m. Schon S. C. * Head J. W.
Gullies Without Alcoves: Linking Gully Meltwater to Recent Ice Age Deposits (the Latitude-Dependent Mantle) [#1204]
Small-scale surficial gullies and channels in the degraded mantle, without alcoves that could serve as accumulation zones for snow, provide independent evidence that gullies form through degradation and melting of ice-rich mantling deposits.

ACID VS. ALKALINE: THE NOACHIAN-HESPERIAN TRANSITION ON MARS
Thursday, 3:15 p.m. Waterway Ballroom 1

Chairs: John Mustard and Joseph Michalski

3:15 p.m. Wilson J. H. * Mustard J. F.
Igneous Compositions in Ares Vallis: Timing and Importance of Volcanics and Fluvial Processes at the Noachian-Hesperian Boundary [#2507]
Spectral detections reveal that compositional differences between Noachian plains and a Hesperian-aged lava flow on the floor of Ares Vallis may capture a compositional evolution, which may help interpret igneous materials from other regions on Mars.
3:30 p.m. Head J. W. III * Wilson L.
*The Noachian-Hesperian Transition on Mars: Geological Evidence for a Punctuated Phase of Global Volcanism as a Key Driver in Climate and Atmospheric Evolution [#1214]*
Early Hesperian peak volcanic flux caused short-term atmospheric warming and led to basal melting of the south polar cap, formation of lower latitude valley networks and open-basin lakes, and a transition to sulfur-dominated weathering.

3:45 p.m. Mustard J. F. * Ehlmann B. L.
*A Stratigraphic Section that Traverses the Noachian-Hesperian Capturing Diverse Habitable Environments [#2355]*
A critical stratigraphic section on Mars whose bedrocks record diverse aqueous environments that document the transition from an early era of phyllosilicate formation to a later sulfate formation era is presented with implications for habitability.

4:00 p.m. Noe Dobrea E. Z. * Michalski J. Swayze G.
*Aqueous Mineralogy and Stratigraphy at and Around the Proposed Mawrth Vallis Landing Site: New Insights into the Aqueous History of the Region [#2153]*
In this work, we show that the terrain within and around the proposed Mawrth Vallis landing ellipse displays a broader range of hydrous mineralogy than previously realized, including the presence of acid-leaching products, sulfates, and dehydrated Mg-smectites.

4:15 p.m. Michalski J. R. Niles P. B.
*Formation of Jarosite in the Mawrth Vallis Region of Mars by Weathering Within Paleo-Ice Deposits [#1926]*
We present new spectral evidence for additional deposits of jarosite in the Mawrth Vallis region of Mars. We discuss an ice weathering model to explain the formation of sulfates in the region and elsewhere.

4:30 p.m. Massé M. Bourgeois O. Le Mouélic S. Verpoorter C. Le Deit L.
*Distribution and Origin of Polar Gypsum on Mars [#1737]*
We demonstrate that gypsum is present on all the north polar superficial sediments including the dune fields and the dust veneers. These gypsum-rich sediments derive directly from the BU and the NPLD ice layers.

---

**DUSTY HORIZONS: INTERPLANETARY, INTERSTELLAR, AND COMETARY PARTICLES**

**Thursday, 1:30 p.m. Waterway Ballroom 4**

**Chairs:** Scott Messenger and Andrew Westphal

 Four Interstellar Dust Candidates from the Stardust Interstellar Dust Collector [#2083]
We report the discovery of two new interstellar dust candidates in the aerogel collectors of the Stardust Interstellar Dust Collector, and the analyses of these and two previously identified candidates.

High Fluence Synchrotron Radiation Microprobe Effects on Stardust Interstellar Dust Candidates [#2812]

We are presenting for the first time damage effects produced by focused high-fluence synchrotron beams on Stardust interstellar dust candidates. The damage produced on submicrometer grains shows up as particle smearing. We attribute this mainly to charging effects.


A New View on Interstellar Dust — High Fidelity Studies of Interstellar Dust Analogue Tracks in Stardust Flight Spare Aerogel [#1823]

High speed [5–30 km/s] interstellar dust (ISD) analogues shot onto Stardust aerogel flight spares show morphology of impact tracks and structural and chemical modification of the projectiles. First results indicate a different ISD flux than previously assumed.

2:15 p.m. Niimi R. * Tsuchiyama A.  Kadono T.  Okudaira K.  Hasegawa S.  Tabata M.  Watanabe T.  Yagishita M.  Machii N.  Nakamura A. M.

Dependence on Projectile Density of Impact Track Morphology in Silica Aerogel [#1934]

We launched projectiles of several densities into silica aerogel at 6 km/s to simulate capture of Wild 2 dust. Our study of track morphology has shown that aspect ratio of an impact track is a good indicator of an impactor’s density.

2:30 p.m. Joswiak D. J. * Brownlee D. E.  Matrajt G.

Comprehensive Examination of Large Mineral and Rock Fragments in Stardust Tracks: Insights Into the Source Regions of Comet Wild 2 Materials [#2246]

Large mineral and rock fragments studied in 16 SD tracks represent a wide range of materials that formed in the nebula including chondrules, RIs, mineral grains, and unequilibrated minerals and rock assemblages that are analogous to cluster IDPs or chondrite matrix.

2:45 p.m. Stodolna J. * Jacob D.  Leroux H.

Comparing Wild 2 Fine-Grained Material to Matrix of Primitive Meteorites [#2025]

We report a TEM examination of the fine-grained material from track 80. It compares well with main characteristics of the matrix of primitive chondrites. This fine-grained Wild 2 material could constitute the very primitive part expected of the comet.
3:00 p.m. Bridges J. C. * Changela H. G. Gurman S. J.
EXAFS Analyses of Comet 81P/Wild 2 [#2692]
EXAFS studies of Comet Wild 2 identify silicate, sulphide, and oxide phases. They also provide more evidence, with complementary XRF, XANES, for Fe oxides, some of which are cometary and some which may be associated with capture.

3:15 p.m. Greenberg M. * Ebel D. S.
3D Fluorescent and Reflective Imaging of Whole Stardust Tracks in Aerogel [#2640]
We present two new methods for three-dimensional imaging and analysis of Stardust tracks: (1) visible light laser fluorescence and spectral imaging of aerogel, and (2) stereo XRF mapping of whole tracks. Combined with existing procedures, we can improve on past analyses.

3:30 p.m. De Gregorio B. T. * Stroud R. M. Nittler L. R. Cody G. D. Kilcoyne A. L. D. Wirick S.
Correlated Microanalysis of Cometary Organic Grains Returned by Stardust [#2603]
Carbonaceous matter in Stardust samples is chemically-similar to IOM in meteorites and IDPs, with additional highly-aromatic and highly-aliphatic components. All extremely N-rich samples studied so far are likely contaminants.

High Precision Oxygen Three Isotope Analysis of Wild-2 Particles and Anhydrous Chondritic Interplanetary Dust Particles [#1240]
Two Wild-2 particles and three anhydrous IDPs show oxygen isotope ratios similar to those of other Wild-2 particles, anhydrous IDPs, and carbonaceous chondrite chondrules, suggesting the presence of the common oxygen isotope reservoir.

4:00 p.m. Flynn G. J. * Lanzirotti A. Sutton S. R.
Fe-XANES Measurement of an Anhydrous Cluster IDP [#2521]
Cluster IDPs sample the anhydrous IDP parent at a larger size than 10 µm CP IDPs. Fe-XANES on L2009R2 gives a mean Fe-valance near Fe²⁺. The absence of Fe-metal suggests that at this size the anhydrous IDP parent is different from Wild 2 particles.

4:15 p.m. Messenger S. *
Stratospheric Collection of Dust from Comet 73P/Schwassmann-Wachmann 3 [#2158]
We consider the prospects for the stratospheric collection of dust from comet 73P/Schwassmann-Wachmann 3 (SW3). SW3 experienced a major outburst and fragmentation event in 1995. We find that SW3 formed an Earth-crossing dust stream that is amenable for collection.

4:30 p.m. Craig J. P. * Sears D. W. G.
New Insight into the Fine Scale Properties of Antarctic Micrometeorites from Thermoluminescence Analysis [#1237]
We measured NTL/ITL of 29 10–15-µm samples from a suite of AMMs that are comparable to IDPs and Stardust. Glow curve shape and ITL levels point to mineralogy inconsistent with CI or CM material with large heterogeneity in thermal/radiation history.
Chairs: Michael Weisberg and Kieren Howard

1:30 p.m. Humayun M. * Weiss B. P.
A Common Parent Body for Eagle Station Pallasites and CV Chondrites [#1507]
We present new siderophile element data for Eagle Station and Cold Bay, and show that these compositions can be derived from CV chondrites, supporting recent paleomagnetic studies for a partially differentiated CV parent body.

1:45 p.m. Dyl K. A. * Young E. D.
Insights from High Precision Oxygen Isotopic Analyses of Reduced CV Meteorite Separates: CV Matrix Homogeneity and Preservation of Nebular Heterogeneity [#2492]
The oxygen-isotopic composition of matrix from reduced CVs Efremovka and Vigaran has been measured and is indistinguishable from Allende. This indicates a similar nebular history and a preservation of different nebular conditions within reduced CV meteorites.

2:00 p.m. Howard K. T. * Benedix G. K. Bland P. A. Gibson J. Greenwood R. C. Franchi I. A. Cressey G.
Mineralogic and O-Isotope Evolution in CM Chondrites: On the Non-Relationship Between Bulk O-Isotopes and Degree of Aqueous Alteration [#2429]
Contrary to predictions, no obvious correlation exists between the degree of aqueous alteration defined by PSD-XRD modal mineralogy and O-isotope compositions of CM chondrites. Heterogeneous hydrous reservoirs and/or consumption of water by oxidation may explain these data.

2:15 p.m. Keller L. P. *
Mineralogy and Petrography of MIL 090001, a Highly Altered CV Chondrite from the Reduced Sub-Group [#2409]
MIL 090001 is a CV chondrite from the reduced subgroup that has been extensively altered. The alteration assemblage is similar to that in CR chondrites. MIL 090001 should be classified as a CV2 chondrite.

2:30 p.m. Goreva Y. S. * McCoy T. J.
Ca/Al Variations in CV3 Dark Inclusions: Evidence for Pre-accretion Aqueous and Thermal Processing [#2269]
Wide range in Ca/Al bulk ratio as well as textural characteristics of Allende dark inclusion studied in this work, suggest extensive aqueous alteration that was followed by high temperature metamorphism prior to incorporation into Allende.

2:45 p.m. Brunner C. E. * Brearley A. J.
Microstructural Investigation of the Crystalline Component of Matrix in the Pristine CR Chondrite MET 00426: Implications for Diversity in Nebular Dust [#1815]
A FIB/TEM study of the matrix of MET 00426. Interesting findings include a possible cluster of primary nebular Fe-Mg carbonate mixed with unequilibrated olivines and sulfides.

3:00 p.m. Lindgren P. * Lee M. R. Sofe M. Zolensky M. E.
Xenoliths in the CM2 Carbonaceous Chondrite LON 94101: Implications for Complex Mixing on the Asteroidal Parent Body [#1349]
Xenoliths with various alteration histories are found in the CM2 carbonaceous chondrite LON 94101, and indicate complex mixing on the asteroidal parent body.
3:15 p.m. Weisberg M. K. * Bunch T. E. Rumble D. III Ebel D. S.
* Petrology and Oxygen Isotopes of NWA 5492, A New Metal-Rich Chondrite [#1198]
NWA 5492 is a metal-rich chondrite breccia. Its silicates are highly reduced. Oxygen isotopes indicate at least two different oxygen reservoirs. The most common oxygen isotope composition is unlike other chondrite groups but is similar to GRO 95551.

3:30 p.m. Friedrich J. M. * Troiano J. Rumble D. III Rivers M. L.
Compositional Studies of Four Low-FeO Ordinary Chondrites: Is a New Chondritic Meteorite Parent Body Necessary? [#1885]
We have investigated the compositions and 3D petrography of the low-FeO ordinary chondrites Burnwell, LAP 04575, EET 96031, and MIL 07273. A reanalysis of Burnwell’s oxygen isotopes shows it to be identical to the H chondrites.

3:45 p.m. Sprung P. * Göpel C. Kleine T. Van Orman J. A. Maden C.
The High-Temperature History and Primary Structure of the L Chondrite Parent Body [#1850]
We present internal Hf-W isochrons for eight equilibrated L chondrites of all petrologic types. Decreasing Hf-W ages with increasing petrologic type show that the L-chondrite parent body had a concentrically layered primary structure.

4:00 p.m. Bendel V. * Patzer A. Pack A. Hezel D. C. Münker C.
Rare Earth Elements in Bulk Chondrites and Chondrite Components [#1711]
Volatility-controlled fractionations of rare earth elements occurred on asteroidal and planetary scale. Fractionations between different chondrite components like matrix, chondrules and refractory inclusions are also discussed.

4:15 p.m. Sissay A. Ostrowski D. Gietzen K. M. Sears D. W. G. *
Near-IR Reflectance Spectral Properties and Metamorphic History of Unequilibrated (Type 3) Ordinary Chondrites [#1601]
Near-IR spectra enable the quantitative determination of clinopyroxene in type 3 ordinary chondrites. As expected, the amount varies with petrographic type 3.0–3.9. This has implications for metamorphism and the nature of asteroid surfaces.

4:30 p.m. Weirich J. R. * Isachsen C. E. Swindle T. D. Li C. Downs R. T.
Progress Towards Turning Ar-Ar Chronology of Ordinary Chondrites into Thermochronology [#1887]
The high temperature release of Chico and NWA 091 is from feldspar enclosed in a higher temperature mineral, which may make it unsuitable for thermochronology. The low temperature release is suitable if we know the structural state of feldspar.

LUNAR SURFACE AND VOLATILES: INTERACTION WITH THE SPACE ENVIRONMENT
Thursday, 1:30 p.m. Waterway Ballroom 6

Chairs: Arlin Crotts and Georgiana Kramer

1:30 p.m. McCord T. B. * Combe J.-Ph.
Relationships of Widespread OH Presence in the Lunar Surface Materials with Lunar Physical Properties [#1483]
Correlations of OH-related spectral absorptions with lunar physical properties suggest solar wind proton-induced hydroxylation as the source of OH. This process may be a source for other OH-related findings and may operate on other airless bodies.

*Water in Lunar Holes? [#1134]*

Recently, three deep holes of larger than tens of meters in diameter were discovered on the Moon. In these holes, we can expect existence of an amount of hydrogen and/or water molecules that would be a clue to the origin of water on the Moon.

2:00 p.m. Combe J.-Ph. * Hayne P. O. Paige D. McCord T. B.

*Spectral Thermal Emission of the Lunar Surface: Implications for Mapping of the Surficial Volatiles and Monitoring Variations with Time of Day [#2573]*

Removal of thermal contribution in lunar surface reflectance spectra is critical for characterizing the composition. We use Diviner temperature measurements to correct M3 spectra and to monitor time of day variations of the 3-µm absorption band.

2:15 p.m. Ichimura A. S. * Zent A. P. Quinn R. C. Taylor L. A.

*Formation and Detection of OH/OD in Lunar Soils After H2+/D2+ Bombardment [#2724]*

Evidence for newly formed OH/OD signals in Apollo 17 mare soil after exposure to 2.3 keV H2+/D2+ ion beams, respectively, is presented. Our study supports the solar wind hypothesis that accounts for the formation of OH/H2O on the lunar surface.

2:30 p.m. Jensen E. A. * Vilas F.

*Lunar Hydration and the Plasma Environment: What Can We Learn from Lunar Transits Through the Earth’s Magnetotail? [#2699]*

Solar wind chemical alteration is considered a source of lunar hydration. For six days out of each orbit, the Moon is immersed within the Earth’s magnetosphere; this plasma population is significantly different from the solar wind allowing comparison.

2:45 p.m. Keller J. W. * Killen R. M. Stubbs T. J. Farrell W. M. Halekas J. S.

*Lunar Ion Transport Near Magnetic Anomalies: Possible Implications for Swirl Formation [#1817]*

We present a new hypothesis, based on low energy ion transport, explaining the bright swirling features on the lunar surface in areas around the Moon that are associated with crustal magnetic anomalies.

3:00 p.m. Farrell W. M. * Killen R. M. Vondrak R. R. Hurley D. M. Stubbs T. J. Delory G. T. Halekas J. S.

*Could Lunar Polar Ice be a ‘Fountain’ Source for the Dayside Water Veneer? [#1770]*

We examine the possibility that impact vaporization of the polar icy regolith provides energy to transport water molecules to mid-latitude surfaces, creating the dynamic water/OH veneer.


*Neutron Suppression Regions at Lunar Poles, as Local Areas of Water-Rich Permafrost [#1787]*

Recent results of LRO/LEND neutron mapping are presented, which allows us/one to identify local Neutron Suppression n Regions (NSR) at lunar poles with high content of hydrogen. The physics of their origin and necessary conditions of water preservation in NSR are discussed.

3:30 p.m. Thomson B. J. * Bussey D. B. Cahill J. T. S. Neish C. Patterson G. W. Spudis P. D.

*The Interior of Shackleton Crater as Revealed by Mini-RF Orbital Radar [#1626]*

Mini-RF on LRO has obtained complete radar coverage of the interior of Shackleton Crater near the lunar south pole. The data reveal patchy and non-uniform occurrences of material with anomalous polarization properties.
Comparing LAMP Data to Models of the LCROSS Vapor Plume [1894]

We model Hg/Ca/Mg/H2/CO gas plume evolution from LCROSS. We find a blast velocity of 3–4 km/s consistent with LAMP observations. Fewer particles achieve great distance at angles close to the horizontal than expected from an isotropic distribution.

The Average Water Concentration Within Cabeus Crater: Inferences from LRO/Diviner, LCROSS and Lunar Prospector [2751]

The relatively high volatile abundances inferred from LCROSS measurements cannot be representative of a homogeneous distribution within the Cabeus permanently shadowed region, but lateral and/or depth variations can account for the discrepancy.

Space Weathering Effects in Lunar Soils: The Roles of Surface Exposure Time and Bulk Chemical Composition [1947]

Transmission electron microscopy was used to study the roles of surface exposure time (estimated by solar flare particle tracks) and bulk chemical composition on space weathering effects. Samples involved in this study are 10084, 71061, and 72051.

Isotopic Compositions of Solar He and Ne in Single Lunar Olivine Grains [1605]

Total fusion experiments have been conducted on 24 single lunar olivine grains, from soil 10084, to extract solar noble gases. This pilot study was undertaken to test the analytical setup and to confirm the level of data quality of the analysis.

MINI-MIMAS AND THOSE BATTERED SATURNIAN SATELLITES

Thursday, 1:30 p.m.  Montgomery Ballroom

Chairs:  Michael Bland and Gerald Patterson

Geology of Mimas? [2729]

Mimas is not just a battered lump of rock (err, I mean ice). Nor is it the wreck of the Death Star. A global thermal event resets topography, global fracturing created grooves, Herschel bashed it, and plasma and electron bombardment alter its surface today.

Mimas Between 0.35–5.1 Microns from Cassini VIMS Observations [1634]

Cassini VIMS observations show that the trailing side of Mimas has smaller ice grains and is coated with Saturn’s E-ring.

Impact Crater Size-Frequency Distribution (SFD) and Surface Ages on Mimas [2772]

We present new results from crater counting on Mimas. We derived surface ages for the heavily cratered plains (4.3 Ga) as well as the crater Herschel (4.1 Ga) and have morphologic evidence for an impact structure larger than the crater Herschel.
2:15 p.m. Bierhaus E. B. * Dones L. Zahnle K. J.
The Role of Ejecta in Mid-Sized Saturnian Satellites’ Crater Distributions [#2616]
We investigate the role, by measurement and by analytics, of primary crater ejecta in the mid-sized Saturnian satellites’ crater distributions.

2:30 p.m. White O. L. * Schenk P. M.
Crater Shapes on the Saturnian Satellites: New Measurements Using Cassini Stereo Images [#2283]
Preliminary crater depth/diameter measurements have been made for the saturnian satellites using Cassini data, updating those of Voyager data. Rhea and Iapetus depth/diameter curves have been used to assess impact basin relaxation on Rhea.

2:45 p.m. Nimmo F. * Parsons R. A. Thomas P. C. Bills B. G.
Long Wavelength Satellite Topography from Limb Profiles: Geophysical Implications [#1523]
Limb profiles are used to derive long-wavelength satellite topography and variation in roughness with wavelength. Most satellites show a reduction in roughness at long wavelengths, perhaps due to a transition from elastic to isostatic support.

3:00 p.m. Hammond N. P. * Phillips C. B. Robuchon G. Beyer R. Nimmo F. Roberts J.
Crater Relaxation and Stereo Imaging of Rhea [#2633]
We use stereo images to measure crater depth and relaxation on Rhea. We compare our observations with a viscoelastic relaxation model to investigate Rhea’s thermal history and subsurface properties.

3:15 p.m. Robuchon G. * Nimmo F. Roberts J.
Impact Basin Relaxation on Iapetus [#1133]
We combine thermal evolution models with basin relaxation calculations. Our results show a maximum relaxation of roughly 30% for the older and bigger basins and 5% for the smaller and are consistent with crater counts given by the Neukum team.

3:30 p.m. Kay J. P. * Dombard A. J.
Unstable Deformation and the Formation of the Equatorial Bulge of Iapetus [#2441]
By simulating a pole-to-equator variation in lithospheric thickness during an epoch of planetary contraction, we can tectonically reproduce the observed shape of Iapetus. Thus, the flattening may not be a frozen rotational bulge, as has been assumed.

3:45 p.m. Walsh K. J. * Levison H. F. Barr A. C. Dones L.
Ridge Formation and Despinning of Iapetus via an Impact-Generated Satellite [#2562]
We present a scenario that both builds the equatorial ridge and despins Iapetus through an impact-generated disk and satellite.

4:00 p.m. Rivera-Valentin E. G. * Blackburn D. G. Ulrich R.
Using Surface Thermal Inertia to Estimate the Thickness of the Iapetian Dark Material [#1073]
Using CIRS surface temperature readings of Iapetus, the new global Iapetian bolometric Bond albedo map, and our thermal model, we provide thermal constraints on the thickness of the dark material overburden.
4:15 p.m. Blackburn D. G. * Rivera-Valentin E. G. Ulrich R. Roe L. A.

*The Upper Bound for CO₂ Transport on Iapetus: Narrowing in on the Nature of CO₂ in the Dark Material [#1216]*

We modeled the loss rate of a hypothetical CO₂ polar cap on Iapetus in order to determine the upper bound flux of CO₂ entering the polar systems. Our model narrowed the potential candidates for the nature of CO₂ in the dark material.

4:30 p.m. Howard A. D. * Moore J. M. Schenk P. M.

Hypothetical Hyperion [#1256]

A simulation model of Hyperion’s surface includes impact cratering, weathering, and mass wasting. The unique “swiss cheese” morphology is due to the non-retention on the surface of most of the impact debris and low crater rim heights.
POSTER SESSION II
Thursday, 6:00 p.m. Town Center Exhibit Area

GIANT PLANETS, RINGS, AND OTHER THINGS

Mosqueira I. Estrada P. R.
On the Origins of the Saturnian Moon-Ring System [#2151]
We examine a recent proposal concerning the origin of Saturn’s rings and inner moons by tidal mass stripping from the mantle of a differentiated Titan-sized satellite.

Yasui Y. Ohtsuki K. Daisaka H.
Angular Momentum Transport in Planetary Rings: Effects of Self-Gravity and Spins of Particles [#1135]
Using local N-body simulation for planetary rings consisting of self-gravitating particles with surface friction, we examine the dependence of viscosity on various parameters such as optical depth and normal and tangential restitution coefficients.

Tanigawa T. Ohtsuki K. Machida M. N.
Gas Accretion Flow onto Circum-Planetary Disks [#1822]
We investigated gas accretion flow onto circum-planetary disks around proto giant planets embedded in protoplanetary disks and found that gas accretion is occurred in the outer region of circum-planetary disks.

Comparative Study of the Molecular Absorption Bands Behavior on Jupiter Before and at the Southern Equatorial Belt Disappearance [#1356]
The preliminary results of the spectrophotometry of Jupiter in 2009 and 2010 are described to show the absence of significant differences of the molecular absorption during 2010 SEB disappearance in comparison with its state in 2009.

Different Behavior of the Magnetic Fields of Jupiter and Saturn [#1218]
Despite their similar size, chemical composition, and rotation rate, Jupiter and Saturn produce very different magnetic fields. Thus it is unlikely that the physical conditions interior to these planets are so similar.

Lystrup M. Radioti A. Bonfond B. Grodent D.
Jupiter’s Aurora as Imaged by the NASA IRTF and Comparison with Hubble Space Telescope Observations in the UV [#1877]
We investigate Jupiter’s infrared aurora using observations from the NASA Infrared Telescope Facility from 1995–2000 as compared with observations in the UV from the Hubble Space Telescope.

Poppe A. R. Horányi M.
The Effect of Nix and Hydra on the Putative Pluto-Charon Dust Cloud [#1201]
We address the effect that Nix and Hydra have on the Pluto-Charon dust environment, via a particle tracing code. We find that Nix and Hydra contribute equal amounts to the optical depth of 0.5 µm grains, for a net optical depth of $4 \times 10^{-11}$. 
Kurokawa H.   Nakamoto T.
Radiation Limits of Ocean Planets: Effects of the Atmospheric Absorption of the Incoming Radiation with One-Dimensional Radiative-Convective Equilibrium Model [#1328]
We investigate the effects of the absorption of the incoming radiation on the radiation limit of the troposphere of ocean planets. To clarify the effects, we use a simple parameterization of the absorption. We have found two important cases.

ICY SURFACES AND INTERIORS

Stryk T.
Recovering Lost Pioneer 10 and 11 Image Data: A Project Status Update [#1267]
The digital scans of Jupiter and Saturn returned by Pioneers 10 (Jupiter only) and 11 have been mostly missing for some time. This poster will present the status of attempts to recover this dataset.

Marion G. M.   Kargel J. S.   Catling D. C.   Lunine J. I.
Modeling Ammonia-Ammonium Chemistries in the Outer Planet Regions [#1220]
This abstract will add ammonia-ammonium chemistry to the FREZCHEM model and then explore the prospects for life on outer planet satellites.

New Horizons/LEISA Observations of the Icy Galilean Satellites [#2163]
We present compositional characterization of the surfaces of Europa, Ganymede, and Callisto using data from the Linear Etalon Imaging Spectral Array (LEISA) on the New Horizons spacecraft, which flew through the Jupiter system in early 2007.

Dougherty A. J.   Avidon J. A.   Hogenboom D. L.   Kargel J. S.
Volumetric and Optical Studies of High Pressure Phases of Sodium Sulfate Hydrates with Applications to Europa [#1242]
We use optical images of high-pressure phases of the Na2SO4-H2O system, coupled with measurements of pressure, temperature, and volume changes, to report eutectic transitions for pressures up to 375 MPa, with implications for modeling Europa’s ocean.

Myszka J. A.   Mastrapa R. M.   Curry A. S.
Methanol and Methanol in Water: Exploring the Spectra [#2561]
We have observed spectra of methanol and methanol in water ices at high (100 K) and low (15 K) temperature deposits in the near- to mid-infrared wavelength range (1–20 µm).

Shi J.   Baragiola R. A.
Suppressed Radiolysis of Hydrogen Peroxide in Water Ice-Hydrogen Mixtures [#2681]
Inspired by the H2O2 formation process in water ice, we tried to enrich hydrogen in the ice films by growing an ice-H2 mixture at low temperatures. Then study the H2O2 production under bombardment of 100 keV H+ with H2 ambient pressures.

Curry A. S.   Mastrapa R. M.   Myszka J. A.
Infrared Spectra of C2H6 and C2H6-H2O [#2690]
Spectra presented here show the shifts in bands of pure ethane, and a water ethane mixture in both the mid infrared, and overlap range.
Jamieson C. S. Noe Dobrea E. Z. Dalton J. B. Pitman K. M. Abbey W. J.

Grain Size Effects on the Diffuse Reflectance Spectrum of Kieserite [#2801]

Hydrated magnesium sulfate salts are considered to be important components of the martian and europan surfaces. In order to model their distributions we spectrally investigate kieserite (MgSO₄•H₂O) and note the spectral difference at different grain sizes.

Cox R. Mikell T.

Geomorphology of Chaos Areas on Europa [#1128]

Large chaos areas have more complex boundary shapes than small ones. Chaos areas are strongly concentrated at low latitudes. Both observations match predictions for impact-penetration features.

Bunte M. K. Thompson D. R. Castaño R. Chien S. Greeley R.

Enabling Europa Science Through Onboard Feature Detection in Hyperspectral Images [#1888]

An automatic endmember detection algorithm applied to the Galileo NIMS catalog identified regions of interest over icy plains and dark linear features. Retrieved spectra captured the full range of diversity and at least one subtle anomaly for Europa.

Stillman D. E. MacGregor J. A. Barr A. C. Grimm R. E. Blankenship D. D. Winebrenner D. P.

A Foundation for Orbital Radar Sounding of Europa from New Measurements of the Broadband Dielectric Properties of Terrestrial Polar Ice Cores [#2193]

We combine new measurements of the temperature-dependent, broadband dielectric properties of terrestrial ice cores with three-dimensional thermomechanical modeling of the europan ice shell, in order to improve constraints on the radar attenuation through the shell.

Blackburn D. G. Buratti B. J. Ulrich R. Mosher J. A.

The Directional Scattering Properties of Iapetus’ Surface [#1217]

We calculated the phase integrals for the leading and trailing hemispheres of Iapetus and compared them to the geometric albedo of the surface using data from the Cassini VIMS instrument.

Galuba G. G. Denk T. Neukum G.

Analysis of Processes of Iapetus’ Terrain Darkening [#1928]

In images of the trailing side of Iapetus, dark crater bottoms are common at low latitudes. The typical length of a drop-off in albedo is below Cassini ISS’ resolution limit. To determine the threshold necessary for the process, we simulated different crater characteristics.

Bauer A. W. Cox R.

Hydrocode Modeling of Impacts at Europa [#1123]

Simulations using iSALE indicate that multiring basin Tyre could represent full crustal melt-through following impact of a 2-km impactor into 20-km crust; and further indicate that more energetic impacts could punch holes directly through the crust.

Korycansky D. G. Nimmo F.

Outer-Planet Satellite Survival During the Late Heavy Bombardment [#1283]

We carried out Monte Carlo simulations of outer planet satellite impacts during the interval associated with the late heavy bombardment. Several present-day satellites (Mimas, Enceladus, Hyperion, and Miranda) would have had low survival probabilities during such an event.

McKinnon W. B. Bland M. T.

Core Evolution in Icy Satellites and Kuiper Belt Objects [#2768]

The possible structures and compositions of icy satellite cores, including that of Titan, are carefully assessed.
Muro G. D.  Nimmo F.
*Modeling the Coupled Thermal and Orbital Evolution of Mimas* [#1560]
If Mimas’ current eccentricity is primordial, it implies that tidal dissipation has been small and that the interior has remained cold throughout its evolution. To investigate this scenario, we have modeled Mimas’ thermal and orbital evolution.

Schenk P. M.  Murphy S. W.
*The Rayed Craters of Saturn’s Icy Satellites (Including Iapetus): Current Impactor Populations and Origins* [#2098]
Rayed craters DO exist on Saturn’s icy satellites. We have mapped more than 100 of them on all the major saturnian icy satellites except Hyperion. They may tell us what the current impactor population is. See my presentation.

*Bright Ray Craters on Rhea and Dione* [#2249]
In this paper we discuss geology, stratigraphy and ages of bright ray craters on the saturnian satellites Rhea and Dione and constrain the origin of potential impactors.

---

**VOLCANISM IN THE OUTER SOLAR SYSTEM**

*Volcanism on Io: Final Results from Global Geologic Mapping* [#1066]
This abstract discusses the results from global geologic mapping of Jupiter’s moon Io, including the geographical distribution of 19 types of material units and diffuse deposits.

White O. L.  Schenk P. M.
*Derivation and Refinement of Topographic Maps of Io Using Voyager and Galileo Stereo Images* [#2315]
Customized ISIS software developed at LPI has been used to create topographic maps of different sites on Io using Galileo stereo images. Input parameters of the software have been refined in an attempt to achieve maps of the best quality.

Davies A. G.  Keszthelyi L. P.  McEwen A. S.
*Erta’Ale (Ethiopia) Lava Lake Thermal Emission Variability — What We Need to Measure to Answer the Biggest Open Question About Io’s Lavas* [#2023]
In order to determine the eruption temperature of Io’s lavas, imagers need to obtain multispectral data very quickly in order to overcome wild variations in derived temperatures caused by rapid cooling and variation in volcanic activity.

Rathbun J. A.  Kamp L. W.  Lopes R. M.  Spencer J. R.
*Tvashtar and Other Active Ionian Volcanoes from New Horizons MVIC and LORRI Data* [#2207]
Measurements of power output and derived temperatures. Neither the Tvashtar nor East Girru eruptions varied dramatically in the two days of observations. The emitting surface at Tvashtar appears to be horizontal.

Hamilton C. W.  Beggan C. D.  Lopes R.  Williams D. A.  Radebaugh J.
*Spatial Distribution of Volcanic Hotspots and Paterae on Io: Implications for Tidal Heating Models and Magmatic Pathways* [#1025]
Global and hemispheric distributions of volcanic hotspots and paterae on Io are examined using a new nearest neighbor analysis technique to test tidal dissipation models and explore possible implications for magma ascent.

Bramson A. M.  Phillips C. B.  Emery J. P.
*A Search for Ongoing Geologic Activity on Jupiter’s Satellites* [#1606]
We have compared images of Jupiter’s satellites from the Galileo flybys of the late 1990’s with images from the New Horizons spacecraft in 2007 to look for changes in surface features as an indication of ongoing geologic activity.
Quick L. C.   Barnouin O. S.   Patterson G. W.   Prockter L. M.
_The Feasibility of Detecting Eruptive Venting on Europa_ [1609]
We present a model for the detection of cryovolcanic venting on Europa, based on optical depths of potential cryoplumes and constrained by the timescale of eruptive venting.

Thompson D. R.   Bunte M.   Castaño R.   Chien S.   Greeley R.
_Onboard Image Processing for Autonomous Spacecraft Detection of Volcanic Plumes_ [2433]
Onboard spacecraft image processing could enable long-term monitoring for volcanic plume activity in the outer planets. A new plume detection technique shows strong performance on images of Enceladus and Io taken by Cassini, Voyager, and Galileo.

A model of the subsurface thermal environment beneath Titan’s Sotra Faculacryovolcanic construct is presented and implications for ammonia-water cryovolcanism are discussed.

Wood C. A.
_Bipolar Volcanism on Titan?_ [1313]
Many circular and irregular depressions in Titan’s polar areas have morphologies consistent with caldera or maar volcanism. If so, concentration of volcanism at Titan’s poles suggests that the low elevations there coincide with thin crusts.

---

**SMALL BODIES: OUTER SOLAR SYSTEM AND METEORS**

Sitko M. L.   Russell R. W.   Lisse C. M.   Kelley M. S.   Wolff M. J.   Hammel H. B.
_The Grain Albedo of Comet 103P/Hartley 2_ [1748]
Comet 103P/Hartley 2 was observed over a wavelength range of 0.44–13 µm. Using these data, the bolometric albedo, the ratio of the scattered light to the sum of scattered and thermal emission, was found to have a value of 0.052.

Ipatov S. I.
_The Outburst Triggered by the Collision of the Deep Impact Module with Comet Tempel 1, and Cavities in Comets_ [1317]
The outburst of Comet Tempel 1 triggered by the collision of the Deep Impact impact module with the comet testifies in favor of the existence of cavities that contained dust and gas under pressure and were located close to the surface of the comet.

_WISE Observations of Jupiter Trojans_ [2190]
We are presenting our analysis of the observations of the Jupiter Trojan population performed by the Wide-field Infrared Survey Explorer. WISE launched December 14, 2009 and began its survey operations a month later.

Doressoundiram A.   Roques F.   Chang H.-K.   Boissel Y.   Shih I. C.   Dauny F.   Liu C.-Y.   MIOSOTYS Team
_The Search for Trans-Neptunian Stellar Occultations with MIOSOTYS_ [1669]
MIOSOTYS (Multi-object Instrument for Occultations in the SOlar system and TransitOrY Systems) is a multi-fiber positioner coupled with a fast photometry camera. The objective is to probe the Kuiper disk through serendipitous stellar occultations.
Spitzer Observations of $\eta$ Corvi: Evidence at $\sim$1 Gyr for an LHB-Like Delivery of Organics and Water-Rich Material to the THZ of a Sun-Like Star [#2438]

We present Spitzer evidence for a KBO’s worth of warm dust in the THZ of the nearby $\sim$1.4-Ga-old Eta Corvi system. Coupled with ongoing production of a large amount of cold KB dust at $\sim$150 AU, we find good evidence for an ongoing LHB in this system.

High Resolution Detection of Geminids 2010 [#1390]

During the Geminids 2010, we tested and used cameras with large CCD sensors to observe multistation meteors in the south of France. These observations will allow computation of the most accurate orbit ever calculated of these video-meteoroids.

A Probable Unexplored Meteorite Fall Found in Archived Weather Radar Data [#1130]

Imagery from NEXRAD radar archives appears to show a meteorite fall at a location defined by eyewitness accounts of a bright meteor event just north of Jacksonville, Illinois, on 04 Feb 2007. Archived radar data may contain many undiscovered falls.

A PRE-DAWN PERSPECTIVE — VESTA AND THE HEDS

Explosive Volcanism on Asteroids Re-Visited: Sizes of Pyroclasts Lost or Retained [#1362]

We calculate the sizes expected for pyroclasts from explosive eruptions on large and small asteroids and specify the sizes of clasts that should be retained on the asteroid surfaces.

Basaltic Asteroids in the Middle and Outer Main Belt Observed by the AVAST Survey [#2821]

We present the preliminary results of reflectance spectroscopy of basaltic asteroids obtained in the Adler V-Type Asteroid (AVAST) survey. In particular, we note several basaltic asteroids in the middle and outer main belt, including 105041 (2000 KO41) and 63085.

Dawn’s Exploration of Vesta [#2730]

The Dawn spacecraft will reach Vesta in mid-2011 and begin a comprehensive geological and geophysical characterization to investigate the geologic history, interior structure, and evolution of this minor planet in the main asteroid belt.

Geoscientific Mapping of Vesta by the Dawn Mission [#1213]

The geologic objectives of the Dawn mission (orbiting Vesta in 2011/2012) are to derive Vesta’s shape, map the surface geology, understand the geological context, and contribute to the determination of the asteroids’ origin and evolution.

Solar Illumination Conditions at 4 Vesta: Predictions Using the Digital Elevation Model Derived from HST Images [#2506]

The illumination/shadowing conditions at 4 Vesta are predicted using the Thomas et al. (1997) HST-derived DEM. Due to the coarse resolution and large axial tilt, no permanently shadowed regions are predicted.
McCord T. B.   Combe J.-Ph.  
*OH and Water on Vesta?*  [#1493]
The possibility that OH is formed on Vesta by solar wind proton-induced hydroxylation as is proposed for the Moon is being explored in preparation for the Dawn spacecraft’s arrival at Vesta.

Coradini A.   De Sanctis M. C.   Ammannito E.   Capria M. T.   Capaccioni F.   Filacchione G.   Fonte S.   Magni G.   Tosi F.   DAWN Team  
*VIS-IR Spectral Imaging of Vesta: The VIR Experiment*  [#1353]
VIR onboard the Dawn mission is designed to characterize the composition of the Vesta surface. VIR performs imaging spectroscopy in the range from the near UV (0.25 μm) through the near IR (5 μm) and has imaging capabilities.

Hicks M. D.   Buratti B. J.   Reddy V.   Lawrence K. J.  
*The Photometric and Spectral Properties of Vestoids: Preparations for the Dawn Encounter at Vesta*  [#2036]
In anticipation of the Dawn mission to 4 Vesta, a campaign to study the spectrophotometric properties of vestoids is underway. We present a phase curve of the V-type NEO 4055 Magellan and discuss results from our spectral survey of 16 vestoids.

Gaffey M. J.  
*Space Weathering on Asteroid (4) Vesta: Waiting for Dawn*  [#2079]
Dawn spacecraft data will provide significant insights into space weathering processes on the surface of Vesta. It seems likely that the space weathering processes on Vesta will differ from those on the Moon and S-asteroids 243 Ida and 433 Eros.

Tkalec B. J.   Brenker F. E.  
*EBSD Study of Lattice Preferred Orientation (LPO) of HEDs (Howardite NWA 2696, Eucrite Camel Donga, Olivine-Diogenite NWA 5480)*  [#1845]
Results of structural analysis performed on HED meteorites (NWA 2696, Camel Donga, NWA 5480) using electron backscatter diffraction (EBSD), to measure the crystallographic orientation of each crystal to discover any lattice preferred orientation.

Mann P.   Cloutis E. A.   Reddy V.  
*The Effect of Changing Viewing Geometry on Pyroxene and Eucrite Reflectance Spectra*  [#2268]
Changing angles of incidence and emission while collecting diffuse reflectance spectra of Vesta relevant materials can affect the band center positions, depth, area, absolute reflectance, and spectral slope.

Satake W.   Buchanan P. C.   Mikouchi T.   Miyamoto M.  
*Redox State of Some Eucrites as Inferred from Iron Micro-XANES Analyses of Plagioclase*  [#2590]
We analyzed plagioclase in four eucrites — ALHA76005, EETA87520, Petersburg, and Piplia Kalan — by Fe-XANES. We found that EETA87520 plagioclase had high Fe³⁺ ratio compared to others, and discussed its origin related to their crystallization on Vesta.

O’Brien D. P.   Sykes M. V.   Tricarico P.  
*Collision Probabilities and Impact Velocity Distributions for Vesta and Ceres*  [#2665]
We calculate the collision probabilities and impact velocity distributions for Vesta and Ceres, and discuss the implications for the current rate of impacts on their surfaces.

Reddy V.   Nathues A.   Gaffey M. J.  
*Fragment of Vesta’s Mantle Detected in Near-Earth Space*  [#2045]
We have discovered the first diogenite-rich asteroid, 1999 TA10, in the NEA population. This provides us with a source for diogenites, constraining Vesta’s crustal thickness, its internal structure, and starting material. Our findings could be verified by the Dawn mission.
Bi-Directional Reflectance Spectra of HED Meteorites: Crystal Field Bands, the 3 Micron Region and the Signature of Vesta’s Mantle [#2056]  
We discuss the bi-directional reflectance spectra of 10 HED meteorites in the 0.4–4.6 µm range.

Garber J. M. Righter K.  
A Howardite-Eucrite-Diogenite (HED) Meteorite Compendium: Summarizing Samples of Asteroid 4 Vesta in Preparation for the Dawn Mission [#2141]  
The howardite-eucrite-diogenite (HED) suite of meteorites, thought to originate from asteroid 4 Vesta, has been summarized into a compendium; it will be made available prior to the planned arrival of the Dawn mission at Vesta in August 2011.

Combe J.-Ph. Le Mouélic S. Launeau P. Irving A. McCord T. B.  
Imaging Spectrometry of Meteorite Samples Relevant to Vesta and the Moon [#2449]  
Reflectance spectral images of Vestan meteorites (howardite, eucrite, diogenite) and lunar meteorite samples have been measured with the imaging spectrometer now set up at the LPG in Nantes. We report on the first results from spectral analysis.

Delaney J. S. Lindsay F. Turrin B. Swisher C. Herzog G.  
Stratigraphy in Basaltic Achondrites: Kapoeta Revisited [#2284]  
Kapoeta lithologies sampled as clasts are being systematically documented petrographically, chronologically, and isotopically by microsampling protocols to constrain in detail the history of the source regolith.

Mittlefehldt D. W. Johnson K. N. Herrin J. S.  
Fluid-Mediated Alteration on 4 Vesta — Evidence from Orthopyroxene Clasts in Howardites [#1834]  
We find evidence that 4 Vesta may be wet and wild (well maybe damp and delirious.) Orthopyroxene grains in some howardites indicate that localize fluid-mediated metasomatism occurred on Vesta. We will discuss the evidence and implications.

Northwest Africa 5721: A Vesicular, Eucrite-Like, Ungrouped Mafic Achondrite from an Unrecognized Parent Body [#1615]  
This eucrite-like specimen has significant petrological and compositional features which make an origin from 4Vesta doubtful.

Sayh al Uhaymir 493: An Unusual Hematite-Bearing, Eucrite-Like Mafic Achondrite with Ferrian Pyroxenes [#1614]  
This very unusual eucrite-like specimen contains phases with appreciable ferric iron, implying oxidative processes on its parent body.

Singerling S. A. Modi A. L. Taylor L. A. McSween H. Y.  
Polymict Eucrites NWA 6105A and 6105B: Paired HEDs [#1207]  
The purpose of this study is to provide petrographic descriptions for two newly discovered polymict eucrites from Morocco (NWA 6105A and 6105B) and determine whether they are paired. Pairing meteorites allows researchers to increase sample size.
Balta J. B.  Beck A. W.  McSween H. Y.
Magmatic Cumulate Textures Preserved by Trace Elements in Diogenite Meteorites [#1107]
We report spatially correlated trace-element variations in both olivines and pyroxenes from diogenite meteorites. P-zoning in olivines and Cr- and Al-zoning in pyroxenes defines primary magmatic cumulate textures in several meteorites.

DUSTY HORIZONS I: INTERPLANETARY DUST PARTICLES AND MICROMETEORITES

Matrajt G.  Messenger S.  Brownlee D.  Joswiak D.
Coordinated TEM, Isotopic and Heating Analyses of Distinctive Carbonaceous Phases in IDPs [#1049]
We investigated carbonaceous phases in IDPs that have distinctive morphologies and isotopic compositions.

Flynn G. J.  Wirick S.
Organic Analysis of Particles from the Stratospheric Collection Coinciding with the Earth’s 2003 Passage Through the Dust Trail of Comet 20P/Grigg-Skjellerup [#1856]
Three of the four particles examined thus far from the Grigg-Skjellerup timed collection, exhibit large aliphatic C-H stretching features, similar to those in other IDPs, that are distinctly different from the silicone oil in which these particles were collected.

Starkey N. A.  Franchi I. A.
Investigating Raman Variation Across Large Cluster Interplanetary Dust Particles [#1938]
Laser Raman microscopy measurements are presented for a suite of cluster IDPs, exploring the variability of the organic material at various scales within and between different clusters.

Hu Z. W.  Winarski R.
Unlocking the Nanoscale Fluffy Structure in Interplanetary Dust with Hard X-Ray Phase Contrast Nanotomography [#2662]
By using X-ray phase contrast nanotomography, we have been able to obtain the three-dimensional structure of an intact IDP at a resolution of 30 nm or better, revealing an extremely fluffy, nanoporous nanograin aggregate and a core-mantle structure for nanograins.

Matsuno J.  Tsuchiyama A.  Noguchi R.  Miyake A.  Shimobayashi N.  Ichikawa S.  Souma N.
Reduction Experiments of Amorphous Silicates with the Mean Composition of GEMS [#1810]
We synthesized amorphous silicates of the mean composition of GEMS and performed reduction experiments for examining the origin of GEMS. We concluded that GEMS is not reduction products as our results were compared with natural GEMS.

Yano H.  Tanaka M.  Okamoto C.  Hirai T.  Ogawa N.  Hasegawa S.  Iwai T.  Okudaira K.
Cosmic Dust Detection by the IKAROS-Arrayed Large-Area Dust Detectors in Interplanetary Space (ALADDIN) from the Earth to Venus [#2647]
IKAROS, a 20-m-wide solar sail spacecraft launched in May 2010, carries the ALADDIN dust detector, which is made of 0.54 m² PVDF sensors deployed on its sail membrane. ALADDIN continuously measures dust flux in the vicinity of the Earth compared to that of Venus within its six-month voyage.

Gritsevich M. I.  Kohout T.  Koschny D. V.
Interplanetary Particle Densities Based on Atmospheric Entry Analysis [#1526]
A new technique of meteor atmospheric entry analysis is presented to determine the bulk density of small meteoroids. The derived bulk density estimates are compared to empirically measured physical properties of known extraterrestrial materials.
Taylor S.  Herzog G. F.  Hornig C. E.  Jones K. W.  
*The Role of Sulfides in Forming Vesicles in Scoriaceous and Porphyritic Micrometeorites* [#1203]

As micrometeorites are heated and transition between unmelted and scoriaceous textures, their surfaces melt. This melt layer temporarily seals the surface allowing gases from the decomposition of sulfides to form vesicles.

Cordier C.  Folco L.  van Ginneken M.  
*Nickel Abundance in Barred-Olivine Cosmic Spherules* [#1363]

We examine the NiO contents in barred-olivine spherules and their olivines collected in the Transantarctic Mountain and South Pole Water Well micrometeorite traps, Antarctica.

Doi M.  Nakamoto T.  
*Shape, Composition, and Texture of Cosmic Spherules* [#2761]

Shapes, compositions, and textures of cosmic spherules are measured and some relations among them are found. Also, it is found that those relations can be understood naturally using a theory.

---

**DUSTY HORIZONS II: STARDUST**


**Constraints on the Interstellar Dust Flux Based on Stardust@Home Search Results** [#2059]

We present constraints on the interstellar dust flux based on Stardust@home search results, informed by recent high-fidelity laboratory calibrations of track sizes in aerogel in the difficult regime above 10 km/s and submicrometer sizes.


**FTIR Analysis of Aerogel Keystones from the Stardust Interstellar Dust Collector: Assessment of Terrestrial Organic Contamination and X-Ray Microprobe Beam Damage** [#1971]

More than 20 aerogel keystones, many of which contained candidates for interstellar dust, were extracted from the Stardust interstellar dust collector and examined with synchrotron FTIR spectromicroscopy.


**Identification of Impact Craters in Foils from the Stardust Interstellar Dust Collector** [#1753]

Imaging of foils from the Stardust Interstellar Dust Collector shows abundant sub-μm to μm-sized impact craters. The craters likely result from interstellar dust, solar wind-accelerated nanoparticles and secondary impacts off of the spacecraft.
Ten submicrometer (235–700-nm) craters were identified on Stardust interstellar foils 1061N and 1031N. The craters are distributed randomly over the foil areas, indicating that the high abundance observed is not due to clusters of secondary impacts.

Characterization of Refractory Presolar Grain Analogues Shot into Al Foil Under Stardust-Like Conditions [#2520]  
We report coordinated TEM/SEM-EDXS/Auger results on test shots of a refractory grain mixture into Al foil under Stardust-like conditions that was undertaken to better calibrate Wild 2 presolar SiC abundances.

Wilkins G.  Dominguez G.  
Simulating Hypervelocity Particle Impact and Survival Probabilities in Aerogel [#2775]  
A general model of hypervelocity capture and track formation in aerogel was extended to allow for the calculation of particle surface temperatures and survival probabilities as a function of size and impact velocity.

Rietmeijer F. J. M.  
Chemistry and Temperatures at the Entrance of Track #80 [#1110]  
Hypervelocity induced temperatures are constrained between 1100° and 1800°C at the entrance hole of Stardust track #80 using measured silicate glass and Fe-Ni-S compound compositions.

Wirick S.  Flynn G. J.  Jacobsen C.  Nakamura-Messenger K.  Zolensky M.  Sandford S.  
Organics from Comet Wild 2 decomposed when exposed to 300 eV photons, resulting in mass loss. This material could not have formed by UV photoionization nor by any large body processes. The organic matter may have formed by impact processes.

Snead C. J.  McKeegan K. D.  
Assessment of Ion Probe Rare-Earth Element Measurement Techniques, in Preparation of a Wild 2 Refractory Grain [#2617]  
We measured the rare-earth element concentrations of a NIST 610 standard and of a calcium-aluminum rich using several ion probe analysis techniques to assess useful yields, in preparation of the measurement of a Wild 2 refractory inclusion.

Stephan T.  Davis A. M.  Pellin M. J.  Savina M. R.  Veryovkin I. V.  King A. J.  Liu N.  
Trappitsch R.  Yokochi R.  
Making CHILI (Chicago Instrument for Laser Ionization) — A New Tool for the Analysis of Stardust [#1995]  
CHILI, a new RIMS instrument, presently under construction at the University of Chicago, will achieve unprecedented sensitivity and <10 nm lateral resolution. It will be applied to the analysis of samples from the Stardust mission and presolar dust.
Veryovkin I. V.  Tripa C. E.  Zinovev A. V.  Baryshev S. V.  Pellin M. J.
*Upgrades to SARISA: Aiming at Quantitative Three-Dimensional Mass Spectrometry on Nanometer Scale [#2790]*
Recent upgrades to the SARISA instrument are described from the perspective of how enhancing its analytical capabilities enabled characterization of a wide range of samples of cosmochemical interest.

**PRIMITIVE METEORITES I: DIVERSITY**

Berlin J.  Salge T.  Falke M.  Goran D.
*Recent Advances in EDS and EBSD Technology: Revolutionizing the Chemical Analysis of Chondritic Meteorites at the Micro- and Nanometer Scale [#2723]*
Recent (revolutionizing!) advances in EDS and EBSD technology are discussed using specific examples relevant to chondrite research.

Strait M. M.  Lipman M. D.  McCausland P. J.
*Visualization of Porosity [#2052]*
Comparing methods of looking at the porosity in meteorite and other geological samples.

Alwmark C.  Schmitz B.  Holm S.  Marone F.  Stampanoni M.
*A 3-D Study of Inclusions in Extraterrestrial Chromite Using Synchrotron Radiation X-Ray Tomographic Microscopy [#1954]*
We describe a method for imaging in three-dimension the interiors of chromite grains and their inclusions using synchrotron radiation X-ray tomographic microscopy. We show that inclusions are a crucial tool in reconstructions of the past meteorite flux.

Levine J.  Segreti M. A.  Heylman K. D.
*Weathering of H-Chondrite Roosevelt County 037 [#1241]*
We examine the weathering of Roosevelt County 037 and the implications of weathering for measurements of the long terrestrial age of this meteorite.

*The Grimsby H Chondrite: Combined Noble Gas and Radionuclide Analysis [#2686]*
We report combined noble gas and radionuclide data from the Grimsby H chondrite, with particular attention on cosmogenic gases for calculating CRE ages and estimating the pre-meteoroid size.

Higgins M. D.  Herd C. D.  Walton E. L.
*Micro-XRF Study of the Buzzard Coulee Meteorite [#1944]*
A 50 by 50 mm slice of the Buzzard Coulee H4 breccia was examined using optical and micro-XRF methods. Fragments are clearly revealed which have contrasting compositions and fabrics. Fabric was developed early during accretion.

*Noble Gas Study on 19 Ordinary Chondrites of the KOREAMET Antarctic Meteorite Collection [#1718]*
The Korea Polar Research Institute (KOPRI) collected 29 meteorites during the 2006, 2007, and 2008 field expeditions in Antarctica. We measured noble gas concentrations and isotopic ratios for 19 ordinary chondrites from the 29 meteorites.
Wittmann A. Swindle T. D. Greshake A. Rumble D. III Kring D. A.  
Geological Context of Ordinary Chondrite Impact Melt NWA 4150 [#1419]  
NWA 4150 is a clast-rich impact melt rock whose metallographic characteristics suggest it formed in a ≥5-km-diameter crater on the L-chondrite asteroid.

Dobrică E. Brearley A. J.  
Earliest Stages of Metamorphism and Aqueous Alteration Observed in the Fine-Grained Materials of Two Unequilibrated Ordinary Chondrites [#2092]  
We performed TEM analysis on the matrix of two very unequilibrated ordinary chondrites. Our observations reveal the response of fine-grained matrix materials to weak thermal metamorphism in the presence of an aqueous fluid.

Alwmark C. Meier M. M. M. Schmitz B. Baur H. Maden C. Wieler R.  
Variations in the Abundance of Regolith Derived Micrometeorites with Time, Following the L-Chondrite Parent Body Disruption at 470 Ma [#2004]  
Noble gas analyses of Chinese and Swedish mid-Ordovician fossil micrometeorites show that the influx of regolith-derived material to Earth, following the L-chondrite parent body disruption at 470 Ma, decreases over time.

Udry A. McSween H. Y. Jr. Taylor L. A.  
Petrology of a New L4 Chondrite NWA 6513 [#2001]  
A new ~4.1 kg L4 ordinary chondrite NWA 6513 has been recovered from the Morocco desert. NWA 6513 displays a very uncommon amount and variety of preserved chondrule textures compared to other ordinary chondrites.

Fall of the Mifflin L5 Chondrite [#1464]  
The Mifflin meteorite fell as a shower at night on April 14, 2010, in Wisconsin, USA. Petrology, mineral chemistry, and oxygen-isotope data indicate Mifflin is a L5 chondrite showing a brecciated texture of light clasts and a dark matrix.

Welten K. C. Meier M. M. M. Caffee M. W. Laubenstein M. Heck P. R. Wieler R. Nishiizumi K.  
Cosmic-Ray Exposure History and Pre-Atmospheric Size of the Mifflin L5 Chondrite [#2707]  
Noble gases and cosmogenic radionuclides in the Mifflin L5 chondrite fall yield a CRE age of ~20 Ma with possible evidence of a complex exposure history. Despite the light-dark brecciation texture, Mifflin is not a regolith breccia.

Nagy Sz. Gyollai I. Józsa S. Bérczi Sz.  
Observation of Colouration of Ringwoodite in the NWA 5011 L5-6 Chondrite [#1285]  
In this abstract we are doing a proof to summarize our observation about the colours of the ringwoodite aggregates, and we propose a possible new idea for the origin of the colorless parts in blue aggregates.

Corrigan C. M. Fries M. D. Welzenbach L. C. McCoy T. J. Fries J.  
The Lorton, Virginia, USA, Meteorite Fall [#1332]  
This abstract describes the recently approved Lorton, VA, USA, meteorite and the conditions surrounding its fall and recovery. We also examine the use of Doppler weather radar to detect falling debris and how these data may predict a meteorite strewn field for this event.

Weirich J. R. Isachsen C. E. Swindle T. D.  
Ar-Ar Age of the L Chondrite Northwest Africa 091: More Evidence that Multiple Isochrons Reveal a Link to Fossil Meteorites [#1910]  
The multiple isochron approach on NWA 091 reveals impacts at 472 ± 6 and 799 ± 71 Ma, with different trapped components at different release temperatures. Two trapped components >1000°C suggests multiple high temperature K domains.
Three heavily shocked L6 chondrites clearly record resetting of their K-Ar systems in the last ~1000 Ma. However, their Ar systematics are complicated enough that it is not obvious whether they were involved in the 475 Ma L-chondrite event.

Cohenite in NWA 5964 (L3–6 Melt Breccia): A Possible Product of Shock-Induced Contact Metamorphism

NWA 5964 (L3–6 melt breccia) contains cohenite that could have formed as the result of shock-induced contact metamorphism.

Alkali-Rich Fragments in LL-Chondritic Breccias

Alkali-rich igneous fragments were identified in brecciated LL-chondrites, Kraehenberg (LL5), Bhola (LL3–6), and Yamato 74442 (LL4). These alkali-rich fragments might be formed from identical precursor materials with related processes.

Origin and Development of Phosphate Minerals in Metamorphosed LL Chondrites

We describe the occurrence of chlorapatite and merrillite in metamorphosed LL chondrites, including grain size distributions, mineral associations, and compositions. Development of phosphate minerals appears to postdate the peak of metamorphism.

Phosphate Minerals in Type 4–6 LL Chondrites: The Nature of Fluids on the LL Chondrite Parent Body

Apatite in the LL chondrites is Cl-rich and extremely dry, with H2O contents <100 ppm. We suggest that this apatite may have a significant oxyapatite component. We infer that very dry, halogen-rich fluids pervaded the LL chondrite parent body.

Low-T Thermochronology of St. Severin LL6 Chondrite Revealed from Single-Grain Phosphate (U-Th)/He Ages

Low-T thermal history of St. Severin LL6 chondrite was constrained from single-grain (U-Th)/He dating for 5 chlorapatite and 14 merrillite aggregates. We also present the new He diffusion data for merrillite from the Guarena chondrite.

Northwest Africa 5492: An Extremely Reduced Chondritic Meteorite with Low Volatile Element Contents

We report on the petrology, bulk and mineral chemistry, and O- and W-isotopes of NWA 5492. This ungrouped chondrite is old and has an enstatite-rich mineralogy and a chondritic bulk chemistry enriched in FeNi metal and depleted in volatiles.

Petrographic and Chemical Variation Among the EH3 Chondrites

We studied 5 EH3 chondrites in order to assess variations in texture and mineral compositions among the EH3s. Three distinct subgroups (primitive, low degree of metamorphism, and moderately metamorphosed) were identified from this study.
Lehner S. W.   Buseck P. B.   McDonough W. F.  
*Trace Element Distribution Among Matrix, Chondrules, Metal, and Sulfides in Sahara 97072 EH3* [1430]
Trace- and major-element data is presented for Sahara 97072, a primitive EH3 chondrite. The results indicate that the silicate proportion of the matrix must have formed from material more depleted in refractory elements than the chondrule precursors.

Jamsja N.   Ruzicka A.  
*Presence of Hydrous Phases in Two R Chondrites, Northwest Africa 6491 and 6492* [2324]
Data presented in this abstract describes two hydrous phases of pre-terrestrial origin that are present in two newly classified R chondrites, NWA 6491 and 6492.

---

**PRIMITIVE METEORITES II: CARBONACEOUS CHONDRITES AND NEW MINERALS**

Nakato A.   Nakamura T.   Noguchi T.   Ahn I.   Lee J. I.  
*The Thermal Evolution of the Primitive Hydrous Asteroids recorded in Dehydrated Carbonaceous Chondrites* [1725]
We studied about 40 carbonaceous chondrites to understand the variety of thermal evolution in the primitive asteroids. Based on our results, degree of heating and aqueous alteration vary among chondrites reflected a wide variation of dehydrated asteroids.

Ostrowski D. R.   Sears D. W. G.  
*Comparison of Spherules of Heated Phyllosilicate-Evaporite Mixtures to Spherules in CI and CR Chondrites* [1209]
Spherules have been generated in lab samples for asteroid spectral comparison that is studied for similarities to the spherules in CI and CR chondrites. Lab spherules are hollow and are more similar to rounded voids in the carbonaceous chondrites.

Gyollai I.   Nagy Sz.   Bérczi Sz.   Gucsik A.  
*Comparison of Aqueous Alteration of Two CV3 (Kaba and Yamato-86751) Chondrites* [1039]
The Kaba meteorite has more pervasive aqueous alteration inside their chondrules; the Y-86751 CV3 chondrite has more altered matrix with flow structure, but much better preserved chondrules.

Dunn T. L.  
*Nickel Abundance of Olivine and Magnetite in CV and CK Chondrites: Evidence for a Continuous Metamorphic Sequence?* [2043]
We examine the suggestion that the CK and CV chondrites were derived from a single, thermally stratified asteroid by using NiO content in magnetite to look for a continuous metamorphic sequence between the two groups.

Runyon S. E.   Dunn T. L.  
*Using Magnetite Compositions to Examine a Possible Genetic Relationship Between the CV and CK Chondrites* [2114]
Magnetite compositions of equilibrated CK 4–6 chondrites, unequilibrated CK3 chondrites and CV chondrites are evaluated as indicators of a possible genetic link between CV chondrites and CK chondrites.

Isa M.   Shirai N.   Ebihara M.   Kubuki S.   Yamaguchi A.  
*Chemical Characteristics for CK Carbonaceous Chondrite* [1876]
Bulk chemical compositions for 16 CK chondrites were determined. Based on their chemical compositions, we discuss about relationship among CK, CV and CO and thermal metamorphism on CK chondrites.
Maldonado E. M.  Brearley A. J.
*Exsolution Textures in Pyrrhotite and Alteration of Pyrrhotite and Pentlandite in the CM2 Chondrites Crescent, Mighei and ALH 81002 [#2271]*
Coarse-grained pyrrhotite-pentlandite grains in CM2 chondrites show a variety of exsolution textures formed during cooling. They also exhibit evidence of secondary replacement.

Bartoschewitz R.  Ott U.  Herrmann S.
*Noble Gas Record of the Anomalous CM Dhofar 1434 [#1661]*
Noble gases of the anomalous CM chondrite Dho1434 were analyzed. The results are presented in view of cosmic ray exposure age, gas retention age, and abundance of presolar phases.

Ireland T. J.  Dauphas N.
*Characterization of the Rare Earth Elements in Murchison Leachates: Relative Abundances and Future Prospects [#1530]*
We present rare earth element (REE) data for six leachates from the Murchison CM2 chondrite, and present some preliminary experimental data for separating the REE from each other using Ln-resin (HDEHP).

Zolensky M.  Frank D.  Le L.
*Olivine and Pyroxene Compositions in Fine-Grained Chondritic Materials [#1898]*
We report new analyses of olivine and low-Ca pyroxene in Wild 2 grains and matrix in chondritic meteorites.

Blinova A.  Zega T. J.  Herd C. D. K.  Stroud R. M.
*A TEM Study of Pristine Matrix from the Tagish Lake Meteorite [#2517]*
This is a continuation of work on the mineralogy and petrology of prominent variations in pristine samples of the Tagish Lake meteorite. Here we present TEM observations of pristine matrix in these specimens.

Bunch T. E.  Irving A. J.  Wittke J. H.  Rumble D. III  Hupé G.
*Petrology and Extreme Oxygen Isotopic Composition of Type 3.00 Carbonaceous Chondrite Northwest Africa 5958: A Unique, Primitive, 16O-Rich Early Solar System Sample [#2343]*
We describe a highly unequilibrated, ungrouped carbonaceous chondrite with bulk oxygen isotopic composition one-sixth of the way toward the solar value.

Ireland T. R.  Law P.  Zolensky M.
*Micro-Scale Distributions of Major and Trace Elements in Chondrites [#1623]*
The returned Itokawa samples will be compared to chondrites. But we need a lot more information at the scale of the grains for comparison. Chondrite matrices are examined for scale of homogeneity and composition.

*The Trace Element Chemistry of Northwest Africa 5958, a Curious Primitive Carbonaceous Chondrite [#2325]*
NWA 5958 is a primitive, carbon-rich carbonaceous chondrite which exhibits refractory and volatile trace element chemistry indistinguishable from CI chondrite, but whose oxygen isotopic composition suggests it has not seen hydrous alteration.
Cathodoluminescence Characterization of the Forsterite in Kaba Meteorite:  
An Astromineralogical Application [#1157]  
A combined CL and SEM study implies that the aqueous alteration on the Kaba forsterite might eliminate intrinsic structural defects progressively from the rim of the grain to the core, accompanied by the migration of diffusible ions of Mn, Cr, and Fe to the rim.

New Titanium Monosulfide Mineral Phase in Yamato 691 Enstatite Chondrite [#1407]  
Here we report a new mineral from Yamato 691 (EH3), ideally stoichiometric TiS, a simple two-element mineral phase, yet with a very unique crystal structure that has not been observed previously in nature.

Ma C.  Tschauner O.  Beckett J. R.  Kiefer B.  Rossman G. R.  Liu W.  
Discovery of Panguite, a New Ultra-Refractory Titania Mineral in Allende [#1276]  
We report here the discovery of panguite (Ti^{4+},Al,Sc,Mg,Zr,Ca)1.8O3, a new titania mineral in Allende, and discuss implications of this phase for processes very early in the history of our solar system.

Guan Y.  Bindi L.  Eiler J. M.  Hollister L.  MacPherson G. J.  Steinhardt P. J.  Yao N.  
Oxygen Isotope Evidence for the Extra-terrestrial Origin of the First Natural Quasicrystal [#2648]  
SIMS oxygen-isotopic data indicate that the first naturally occurring quasicrystal is associated with a diverse assemblage of high-temperature refractory chondritic minerals (silicates and oxides) formed in the early solar system.

ORGANICS AND VOLATILES IN CHONDRITIC METEORITES AND THE SOLAR WIND

Hoffman E. J.  Veblen L. A.  Abreu N. M.  Howard K. T.  
Reaction Products of Synthetic Mg-Silicates Hydrated in a Humid Chamber [#2526]  
As characterized by TEM and PSD-XRD the products resemble hydrated protosilicates in primitive meteorites. The optimal hydration temperature is about 291 K, a new constraint for models of early solar system formation.

Rietmeijer F. J. M.  Pun A.  Nuth J. A.  
Making Amorphous Ferromagnesiosilica and Metastable Magnesioferrite and Fayalite [#1027]  
Formation of amorphous and crystalline astronomical ferromagnesiosilicates and Mg,Fe-oxide.

Chizmadia L. J.  Santiago-Soto W.  Lebron-Rivera S. A.  
Exploring the Relationship Between Fe:Si and Smoke:Water Ratios During Aqueous Alteration of Amorphous Fe-Silicate Smokes [#2156]  
The minimum pH values of 3.9 were achieved by the smokes with the highest Fe:Si ratio. The 40 mg:2mL ratios usually provide the lowest pH values for each given composition. The temperature profiles for hydration of Fe-silicate smokes are complex.

Noguchi R.  Tsuchiyama A.  Noguchi T.  Libourel G.  
Hydrothermal Alteration Experiments of Amorphous Silicates:  Dependence of Water/Rock Ratio [#1789]  
To understand the effect of water/rock ratio on aqueous alteration in carbonaceous chondrites, hydrothermal experiments of amorphous silicates with the CI composition were made. Saponite formation requires higher W/R ratio than serpentine formation.

Nagahara H.  Ozawa K.  
Thermodynamic and experimental study shows that phyllosilicates are formed from amorphous silicate at higher temperatures than previously estimated, which may play a role on the evolution of organic materials before accretion of a planetesimal.
Goodyear M. D.  Gilmour I.  Pearson V. K.
Development of Visualisation Methodology for Organic Materials Contained Within Carbonaceous Chondrites [#1253]
The development of methodology for the derivatisation of the organic components of carbonaceous chondrites is described. This methodology will be used to determine the location of organic materials, in situ, and at high resolution.

Garvie L. A. J.
Something Fluoresces in Carbonaceous Chondrites — What is It and is It Important? [#1316]
Carbonaceous chondrites contain abundant fluorescent particles. TEM and SEM studies show that these particles are carbonaceous nanoglobules.

Vollmer C.  Leitner J.  Busemann H.  Spring N.  Hoppe P.
The Association of 15N-anomalous Matter with Stardust in Chondrites Acfer 094 and NWA 852 [#1720]
We report on the observation of associated stardust and nitrogen anomalies in the carbonaceous chondrites Acfer 094 and NWA 852 by NanoSIMS. These associations might help to understand contrasting formation mechanisms of nitrogen anomalies in meteorites and IDPs.

Fries M.  Bhartia R.  Steele A.
Carbonaceous Chondrite Groups Discerned Using Raman Spectral Parameters [#1860]
A series of carbonaceous chondrites is differentiated by type using Raman spectra of their carbon alone.

Bose M.  Floss C.   Stadermann F. J.
Carbonaceous N-Anomalous Grains in the CO3.0 Meteorite ALHA77307 [#1444]
We report N and C anomalies that have been identified in situ in the primitive meteorite ALHA77307. Characterization of the anomalies using the Auger nanoprobes shows that the carrier phase is primarily carbonaceous in nature.

Wang Y.  Kebukawa Y.  Cody G. D.   Alexander C. M. O'D.
Deuterium Speciation in Chondritic Organic Solids: A Relic of Cold Molecular Processes [#2380]
Direct detection of deuterium speciation in chondritic organic solids via NMR reveals aliphatic C is the D carrier. D enrichment is shown to be a relic of very high initial D that is reduced through D-H exchange with D-poor parent-body fluids.

Extensive Organic Molecular Evolution in Different Tagish Lake Meteorite Fragments [#2455]
Extensive molecular evolution in organic solids from different Tagish Lake fragments is revealed through complementary spectroscopic techniques. Insight into Tagish Lake parent-body processing is revealed and is consistent with localized heating.

Busemann H.  Baur H.  Vogel N.  Wieler R.
Primordially Trapped Heavy Noble Gases in Rumuruti Chondrites? [#2793]
We discuss Kr and Xe abundances in Rumuruti chondrites. None of the samples need to contain phase Q gases to explain the results. Phase Q might have been destroyed by parent body oxidation or by oxidation of the precursor material in the nebula.
ortho-daunay f.-r.  thissen r.  vuitton v.  somogyi a.  mespoulede m.  beck p.  bonnet j.-y.  dutuit o.  schmitt b.  quirico e.

orbitrap-ms and ft-icr-ms of free and labile organic matter from carbonaceous chondrites [#2654]
we used two types of high-resolution ft-ms to analyze the free and labile organic matter in carbonaceous chondrites of type 1 and 2. the methanol extraction and laser desorption gave access to highly and poorly functionalized molecules respectively.

snc meteorites: igneous and alteration processes

satterwhite c. e.  mcbride k. m.  harrington r. s.  righter k.
processing of antarctic meteorites at nasa/johnson space center [#2632]
discusses processing of antarctic meteorites in the meteorite processing lab at nasa johnson space center.

righter k.  mcbride k. m.
the miller range nakhlites: a summary of the curatorial subdivision of the main mass in light of newly found paired masses [#2161]
the curatorial subdivision of the miller range nakhlite mil 03346 will be summarized, as well as the science resulting from studies of nearly 200 subsamples of this large nakhlite. this summary has been motivated by the discovery of three additional paired masses.

corrigan c. m.  vicenzi e. p.  konicek a. r.  lunning n.
an examination of the new miller range nakhlites (mil 090030, 090032, and 090136) [#2657]
we examine the new miller range nakhlites (mil 090030, mil 090032, and mil 090136) and their relationship with nakhlite mil 03346.

williams c. d.  wadhwa m.  bell d. r.
lithium isotope measurements of pyroxenes and evaluation of matrix effects in sims analyses: application to martian meteorites [#2398]
we have measured the li isotopic composition in terrestrial pyroxene megacrysts by sims and mc-icpms to assess the role of matrix effects and their potential influence on the analysis of martian pyroxenes.

jones j. h.  hanson b. z.
a groundmass composition for eet 79001a using a novel microprobe technique for estimating bulk compositions. lithology a as an impact melt? [#2095]
a new and improved estimate for the groundmass composition of lithology a lies on a mixing line between lithology b and an ultramafic assemblage.

kuehner s. m.  irving a. j.  herd c. d. k.  gellissen m.  lapen t. j.  rumble d. iii
pristine olivine-phyric shergottite northwest africa 6162: a primitive magma with accumulated crystals derived from depleted martian mantle [#1610]
petrological and compositional studies of this very fresh depleted olivine-phyric shergottite indicate that it does not represent a magmatic liquid.

becker t. e.  reynolds v. s.  beane r. j.  mccoy t. j.
preferred orientations of pyroxene in the zagami shergottite: implications for magmatic emplacement [#2474]
electron backscatter diffraction (ebsd) techniques on the (normal) zagami shergottite identify foliated but not lineated pyroxenes within the coarse-grained lithology. results for fine-grained lithology will be presented.
Herd C. D. K.  McCoy T. J.
Baddeleyite Occurrences in Zagami and QUE 94201: ‘QUE Q.E.D.’  [#1801]
Can baddeleyite be found in even the most reduced martian basalt? We document the occurrence of baddeleyite in the Zagami dark, mottled lithology and QUE 94201, and find that this mineral can be found even in QUE 94201: ‘QUE Q.E.D.’

Pooling of Water and the Formation of Evaporite Minerals in the Martian Sub-Surface  [#2148]
A combined 3D computed tomography and high resolution electron microscopy study of secondary minerals in the Nakhla meteorite, focusing on the formation of halite.

McCubbin F. M.  Elardo S. M.
Chlorine-Rich Fluid Interaction with Chassignite and Nakhlite Magmas  [#2358]
Apatites have been analyzed from several Nakhlite and Chassignite meteorites, and all samples analyzed thus far indicate likely magma-brine interaction. Work is ongoing to determine the source of the Cl-rich fluid.

Acid-Sulfate-Weathering Activity in Shergottite Sites on Mars Recorded in GRIM Glasses  [#1476]
Elemental abundances determined in gas-rich impact-melt (GRIM) glasses from EET 79001, Shergotty Zagami, and QUE 94201 show that acid sulfate fluids interacted with the basaltic parent material at shergottite sites on Mars.

Franz H. B.  Farquhar J.  Irving A. J.
Acid-Volatile Sulfur Isotopic Composition of Six Shergottites  [#2338]
We report here new measurements of the isotopic composition of acid-volatile sulfur from several shergottites.

Hallis L. J.  Taylor G. J.  Stopar J. D.  Velbel M. A.  Vicenzi E. P.
Martian vs. Terrestrial Alteration Assemblages in MIL 03346 and Nakhla: Hydrogen Isotope and Compositional Comparisons  [#1442]
Pre-terrestrial secondary alteration phases have been reported within the nakhlite group of martian meteorites by numerous authors. We aim to determine which occurrences within MIL 03346 and Nakhla are terrestrial and which are pre-terrestrial.

Kuebler K. E.  Wang A.  Jolliff B. L.
Review of Terrestrial Laihunite and Stilpnomelane Analogs, Identified as Potential Secondary Alteration Phases in MIL 03346  [#1022]
Stilpnomelane and laihunite have been identified as secondary phases in MIL 03346. These identifications are unusual so we present supporting evidence here: Raman and XRD spectra for stilpnomelane, Raman spectra for laihunite, and EMPA for both.

Recognizing the Effects of Terrestrial Contamination on D/H Ratios in Shergottite Phosphates  [#1920]
Hydrogen isotopes ratios in shergottites are shown to be strongly influenced by terrestrial contamination. The difficulty in distinguishing martian variations in D/H from variable terrestrial contamination is highlighted.

Cosmic-Ray Exposure Chronologies of Depleted Olivine-Phyric Shergottites  [#2371]
Cosmogenic radionuclides and noble gases in NWA 4925 and seven other shergottites were measured. All eight shergottites must have been ejected from Mars by a single impact at 1.1 ± 0.1 Ma ago but reached Earth at different times individually as small objects.

156  42nd LPSC Program, Thursday Poster Sessions
Korochantseva E. V.  Schwenzer S. P.  Buikin A. I.  Hopp J.  Ott U.  Trieloff M.
Cosmic Ray Exposure Ages of Nakhlites — Nakhla, Lafayette, Governador Valadares — and Chassigny: 
One Ejection Event? [#1263]
To provide further insight into the vigorously discussed question if all nakhlites and Chassigny were ejected by the 
same impact event from a common martian location, we present new CRE ages for nakhlites and Chassigny obtained 
by different methods.

MARS ALTERATION: CARBONATES, SULFATES, CHLORIDES, AND PHYLLLOSILICATES

Saper L. M.  Bishop J. L.
Reflectance Spectroscopy of Nontronite and Ripidolite Mineral Mixtures in Context of Phyllosilicate Unit 
Composition at Mawrth Vallis [#2029]
Spectroscopic analyses of phyllosilicate mixtures are applied to understanding the stratigraphic units at 
Mawrth Vallis. Mixtures of Fe²⁺ clays such as ripidolite could be present in between the nontronite and 
montmorillonite type units.

Farrand W. H.  Glotch T. D.  Rice J. W.  Hurowitz J. A.
Non-Linear Unmixing of CRISM Spectra over the Mawrth Vallis Region: Implications for 
Level of Alteration [#1952]
Non-linear unmixing of CRISM data over the Mawrth Vallis region indicates higher fractions of alteration minerals 
in the Al phyllosilicate unit vs. the Fe/Mg smectite unit.

Annex A. M.  Howard A. D.
Phyllosilicates Related to Exposed Knobs in Sirenum Fossae, Ariadnes Colles [#1577]
Summary of findings in Ariadnes Colles regarding light-toned deposits underneath “Electris” deposit using CRISM 
full-resolution targets; and resulting implications regarding paleolake hypothesis for formation of Ma’adim Valles.

Wintzer A. E.  Allen C. C.  Oehler D. Z.
Phyllosilicate Deposits in Shalbatana Vallis [#1557]
We contribute to the understanding of the geologic history of Shalbatana Vallis using data from the MRO spacecraft, 
evaluating the mineralogy, origin, and placement of Fe/Mg-rich and Al-rich phyllosilicates in the region.

Goudge T. A.  Mustard J. F.  Head J. W.  Fassett C. I.
Open-Basin Lakes on Mars: A Study of Mineralogy Along a Paleolake Chain [#2244]
The mineralogy of deposits in six connected open-basin lakes from CRISM data show that all six are dominated by a 
mafic-rich material (olivine and HCP), with two also showing unique phyllosilicate mineral signatures (kaolinite and 
Fe/Mg-smectite).

Roush T. L.  Marzo G. A.  Fonti S.  Orofino V.  Blanco A.  Gross C.  Wendt L.
Assessing Spectral Evidence of Aqueous Activity in Two Putative Martian Paleolakes [#1181]
We report on our investigation of CRISM observations of putative paleolakes on Mars to evaluate the evidence for 
the presence of mineral spectral signatures indicative of the past presence of water at these sites.

Tu V.  Baumeister J.  Metcalf R.  Olsen A.  Hausrath E.
Serpentinite Weathering and Implications for Mars [#2303]
Near-surface soil environments may be important habitats for life on Mars accessible to future missions. Weathered 
serpentinites indicate the formation of Al-rich surfaces and smectites, and the presence of Fe-oxidizing bacteria.
Hahn B. C.  McSween H. Y.  Tosca N. J.
*Constraints on the Stabilities of Observed Martian Secondary Mineral Phases from Geothermal Gradient Models [#2340]*
We attempt to place thermal constraints on the stability of exposed secondary mineral phases on Mars based on heat flow and geothermal gradients modeled at the time of mineral formation and burial.

Baldrige A. M.  Lane M. D.  Wray J. J.
*The Earlier Mars Odyssey Orbit Time Reveals Aqueous Mineralogy in Mid-IR Data [#1663]*
The Thermal Emission Imaging System (THEMIS) in orbit at Mars since early 2002, recently moved to an earlier, warmer orbit time. The new data reveal aqueous surface mineralogy in regions coinciding with VNIR detections.

Hong J. K.  Herd C. D. K.  Cavell R. G.
*Applications and Limitations of Synchrotron X-Ray Radiation Methods in the Study of Jarosite in Martian Meteorites [#1936]*
Synchrotron XRF and XRD analyses were conducted on jarosite occurrences in the MIL 03346 martian meteorite in order to characterize the mineral *in situ* and provide insights into the depositional environment of Mars in the past.

Lane M. D.  Mertzman S. A.  Dyar M. D.  Bishop J. L.
*Phosphate Minerals Measured in the Visible-Near Infrared and Thermal Infrared: Spectra and XRD Analyses [#1013]*
Phosphate mineral spectra are presented for visible-near infrared and thermal infrared techniques. Samples are being analyzed using XRD to verify their mineralogy.

Horgan B.  Mann P.  Stromberg J.  Cloutis E. A.
*Acid Alteration of Basalts, Andesites, and Anorthosites: Near-IR Spectra and Implications for Martian Soil Formation [#2415]*
Laboratory experiments indicate that acid alteration causes pH-dependent, observable changes to the near-IR spectra of mafic minerals, likely due to differences in solubility. Observations suggest that this process may have occurred in martian soils.

Filiberto J.  Schwenzer S. P.
*Hydrothermal Alteration Mineralogy of Home Plate: Thermochemical Constraints for Their Formation Conditions [#2072]*
Our results imply intermediate to high W/R and low to intermediate temperatures during alteration of the Home Plate region.

Jänchen J.  Brettschneider T.
*Hydration and Dehydration Properties of MgSO₄, FeSO₄ and Fe₂(SO₄)₃ Close to Martian Surface Conditions [#1369]*
The water vapor interaction of Mg- and Fe-sulfates identified in the martian soil has been determined quantitatively by adsorption methods to support evaluation of spectroscopic data from orbit or future surface missions by rovers.

Hanley J.  Chevrier V. F.  Dalton J. B.  Jamieson C. S.
*Reflectance Spectra of Low-Temperature Chloride and Perchlorate Hydrates Relevant to Planetary Remote Sensing [#2327]*
Spectra of hydrated chlorides and perchlorates show strong temperature-dependent features that should allow for their identification on other planetary bodies.

Zhao Y.  McLennan S. M.
*Experimental Evaluation of Photochemical Influences on Bromine and Chlorine Geochemistry on Mars [#1667]*
Experimentally evaluate of possible photochemical influences on halogen elements Br and Cl behavior and distribution on the martian surface.
Hanley J. Chevrier V. F. Berget D. Adams R. D.
Thermodynamic Properties of Aqueous Chlorate Solutions and Their Applications to Mars [#2545]
Intermediate oxidation species of chlorine salts are investigated to determine their thermodynamic parameters and stability diagrams.

Hughes C. G. Ramsey M. S.
Super-Resolution of Martian Chloride Sites [#2248]
Super-resolved THEMIS data show the border of the putative chlorides to be a less-well defined area, with surrounding material located within apparently pure areas. These exposures are collocated with lower albedo areas seen in HiRISE and CRISM data.

Jensen H. B. Glotch T. D.
Investigation of the Near Infrared Spectral Character of Putative Martian Chloride Deposits [#2099]
To greater understand the NIR spectral character of proposed chloride-bearing regions of Mars in ratioed CRISM data, spectra of mixtures of halite or pyrite with silicate minerals and rocks were collected to replicate the featureless red slope.

Gordon S. Hanley J. Chevrier V. F. Teng F.-Z.
Isotope Fractionation of Magnesium Chloride During Crystallization: Applications to Mars [#2719]
Our goal is to determine the relationship between fractionation and temperature, if any, for magnesium, and to use our findings to analyze any future martian samples for possible previous water-conducive conditions on Mars.

ten Kate I. L. Stern J. Malespin C. A. Glavin D. P.
Interaction of perchlorate with JSC Mars-1 During Evolved Gas Analysis [#1011]
Within the context of the recent findings of perchlorates on Mars and the implications for organic detection using evolved gas analysis (EGA), we have analyzed JSC Mars-1 spiked with Na-perchlorate using EGA. First results are presented.

Sutter B. Ming D. W. Boynton W. V. Niles P. B. Morris R. V.
(Ca,Mg)-Carbonate and Mg-Carbonate at the Phoenix Landing Site: Evaluation of the Phoenix Lander’s Thermal Evolved Gas Analyzer (TEGA) Data Using Laboratory Simulations [#2351]
Re-evaluation of the Phoenix Lander’s Thermal Evolved Gas Analyzer (TEGA) data using laboratory simulations suggest that TEGA results are consistent with the detection of (Ca,Mg)-carbonate and Mg-carbonate.

Perry K. A. Bishop J. L. Dyar M. D. Blake D. F. Peel S. Brown A. J.
Spectral Analysis of Nontronite-Magnesite-Olivine Mixtures and Implications for Carbonates on Mars [#1554]
This study evaluates the character of magnesite in mixtures with nontronite and forsterite. Carbonate bands dominate mixtures above 3.2 µm while phyllosilicates dominate below 3.2 µm. This implies there may be more carbonates on Mars than estimated.

Wendt L. Gross C. Kneissl T. Sowe M. Combe J.-Ph. LeDeit L. McGuire P. C. Neukum G.
Mineralogy and Stratigraphy of Sulfates and Ferric Oxides in Ophir Chasma, Mars [#1775]
We analyze sulfates and ferric oxides in the light-toned deposits in Ophir Chasma using data from OMEGA and CRISM combined with imagery and digital elevation models.

Dehouck E. Chevrier V. Gaudin A. Mangold N. Mathé P.-E. Rochette P.
Role of Sulfide-Weathering in the Formation of Sulfates or Carbonates on Mars [#1715]
Experimental weathering of silicate/sulfide mixtures shows that this process can reproduce the mineralogy of the martian sulfate-bearing deposits, suggesting that martian sulfates may have formed from sulfide-rich basalts in local acidic conditions.
Volk K. E.  Niles P. B.  Socki R. A.  
*Covariant C and O Isotope Trends in Some Terrestrial Carbonates and ALH 84001: Possible Linkage Through Similar Formation Processes* [#1975]
In this study we sought to identify discrete microscale isotopic variation within the carbonate crusts in Sunset Crater to see if they resembled the microscale isotope variation found in ALH 84001 carbonates.

Kounaves S. P.  
*The Production of L-Dominant Biotic and Abiotic Chirality on Mars* [#2377]
Homochirality on Mars may have its genesis in (1) exogenous delivery during formation and post-bombardment and (2) ongoing irradiation by CP-UV. Presence of L-amino acids on Mars suggests that nonracemic chirality may not allow definitive tests for biology.

Berger J. A.  King P. L.  Kunkel T. S.  Spilde M. N.  Crisp J. A.  
*Thermal Infrared Spectroscopy of Halite-Coated Glasses — An Evaluation of Continuous Versus Discontinuous Coatings* [#1574]
This study examines the effects of thin (~100 μm) chloride salt coatings on the thermal infrared energy of underlying substrates as a function of both the coating coverage (discontinuous vs. continuous) and coating thickness.

---

**IGNEOUS GEOCHEMISTRY OF THE MARTIAN SURFACE**

Byrnes J. M.  Byrnes J. J.  
*Thermal Infrared Reflectance and Emission for Remote Analysis of Planetary Surfaces* [#2384]
Establishing the utility and limitations of using thermal infrared reflectance and emission data together will allow leveraging of the beneficial aspects of each technique for studying the surfaces of Earth, Mars, and other rocky planetary bodies.

Jones E.  Mills F.  Doran B.  Caprarelli G.  Clarke J.  
*New Unsupervised Classification of the Martian Surface Into TES Thermal-Inertia Albedo Units* [#1093]
We have utilized unsupervised classification algorithms to identify new features in martian surface materials through TES thermal inertia and albedo data.

Gasnault O.  Newsom H.  Pinet P.  Mars Odyssey GRS Science Team  
*Update on Elemental Martian Provinces* [#2685]
The Odyssey GRS maps were recently reprocessed. We check the implications on the definition of uniform provinces. Their compositions imply the presence of diverse igneous rocks, and suggest both local and regional sources for the surficial materials.

*Characterizing the 3-D Water Distribution on the Mars Surface* [#2187]
We present the most recent results of applying a Pixon image reconstruction approach to the Mars Odyssey epithermal neutron data coupled with information regarding the distribution of water and hydroxyls, including hydrous minerals, as identified by MRO-CRISM samples.

Francis D.  
*Columbia Hills — An Exhumed Layered Igneous Intrusion?* [#1085]
The compositional variation exhibited by the analyzed rocks and outcrops of the Columbia Hills are better explained if they are intrusive cumulate rocks, whose compositions are controlled by magmatic crystal sorting, rather than volcanic pyroclastic rocks.
Cole S. B. Watters W. A. Squyres S. W.
Stratigraphic Relationships on Husband Hill, Mars [#1159]
We measure bedding plane orientations of outcrops on Cumberland Ridge in the Columbia Hills. Our measurements are consistent with the hypotheses that the outcrops (1) form a stratigraphic section, and (2) drape the Husband Hill edifice.

Weitz C. M. Bishop J. L. Thollot P. Mangold N. Roach L. H.
Diverse Mineralogies in Two Troughs of Noctis Labyrinthus, Mars [#1724]
We have used data from the Mars Reconnaissance Orbiter to map out hydrated units and infer the geologic history of two troughs in Noctis Labyrinthus that display a diversity of mineral assemblages.

Clenet H. Flahaut J. Quantin C. Pinet P. C. Daydou Y. Allemand P.
Compositional Diversity of Mafic Rocks in the Vicinity of Valles Marineris, Mars, Using Modified Gaussian Model [#1674]
We use adapted Modified Gaussian Model to extract information on the chemical composition of mafic minerals in the vicinity of Valles Marineris, Mars. First results on CRISM data on the northern wall of Coprates Chasma show complex mineralogies.

Evidence for Compositional Dikes Intruding the Emplaced and Preserved Noachian Crust in Valles Marineris, Mars [#1830]
We report here the occurrence of dikes in a remarkably preserved crustal outcrop in the walls of Valles Marineris. Dikes are analyzed for the first time with both HiRISE and CRISM, providing crucial information on magmatic processes in this area.

Brandenburg J. E.
Evidence for a Large, Natural, Paleo-Nuclear, Reactor on Mars [#1097]
On Mars, the ingredients for natural nuclear reactors were present. A large natural paleo-nuclear reactor may have operated on Mars in the N. Mare Acidalia and explosively disassembled, releasing $^{129}$Xe and $^{40}$Ar and a surface layer of Th and K.

---

**CRUSTY MARS AND THE ANTARCTIC: BRINES, CLATHRATES, HYDRATES, SALTS, GULLIES, AND METHANE**

Lanza N. L. Newsom H. E. Osterloo M. M.
The Systematic Effects of Martian Gravity on Hillslope Materials and Mass Movement Processes [#2383]
Martian gravity is lower than that of Earth, and this difference will cause subtle shifts in the relationships between friction, cohesion, and pore pressure, which in turn will lead to slight differences in hillslope processes and resultant landforms.

Price M. C. Conway S. J. Towner M. C. Burchell M. J.
Hydrocode Modelling of Fluvial Flow with ANSYS CFX: Comparison with Martian Analogue Lab-Scale Experiments [#1771]
Martian fluvian flow analogue experiments are used to develop an accurate hydrodynamic computer model to enable constraints to be placed on the volume of liquid water required for the formation of martian gullies.

Ojha L. McEwen A. Dundas C. Mattson S. Byrne S. Wray J.
Transient Slope Lineae on Mars: Observations by HiRISE [#2101]
Transient Slope Lineae (TSL) are relatively dark albedo markings with sharp margins, extending downhill on steep slopes, that are narrow (typically up to 2 m wide) and have lengths up to hundreds of meters. In this abstract we describe the observations of TSL.
de Mijolla G. M.  Howe K. L.  Dixon J. C.
Experimental Simulation of Martian Slope Streak Formation [#1142]
Slope streaks are currently forming on Mars, but the means of their formation is uncertain. We have been using viscous fluid flows at different temperatures and in different substrates to try and assess the validity of the wet flow theory.

Jouannic G.  Gargani J.  Costard F.  Ori G. G.  Marmo C.  Schmidt F.
Recent work shows that the gullies of the Russell Dune are not only extremely youthfull but seem to be still active. This study aims to compare the debris flows and present flows activity using morphologies and estimated physical flows properties.

Dundas C. M.  Diniega S.  McEwen A. S.  Byrne S.
Observations of Present-Day Gully Activity on Mars [#2709]
We report on HiRISE observations of activity observed in martian gullies, including significant morphologic changes.

Raack J.  Reiss D.  Hiesinger H.
Absolute Model Ages and Stratigraphic Relationships of Gullies in the Northwestern Argyre Basin, Mars [#2596]
We present absolute model ages for the dust/ice mantle in the northwestern Argyre basin and the stratigraphic relationships on the basis of a detailed morphologic map with other glacial, aeolian, and fluvial units (gullies).

Manthey A.  Hiesinger H.  Reiss D.  Bauch K. E.
Possible New Constraints on Gully Formation in Nirgal Vallis from High Resolution Thermal Inertia Data [#2467]
We derive thermal inertia data from THEMIS infrared images to put more constraints on gully-formation processes in Nirgal Vallis, Mars.

Schon S. C.  Head J. W.
Observations of Gully Development in Gasa — A Rayed Crater [#2546]
A young rayed crater (Gasa) has prominent gullies in its pole-facing wall. We suggest that these gullies formed due to orientation- and insolation-dependent melting of local ice and snow deposits.

Levy J. S.  Fountain A. G.  Nylen T. H.  Head J. W.  Dickson J. L.
Rapid Growth of Mars-Analog Gullies in a Buried Ice Substrate: Gullies as a Disequilibrium Landform in Garwood Valley, Antarctica [#1432]
Gullies in Garwood Valley, Antarctica, form in buried ice that may be highly analogous to martian gullies forming in the latitude-dependent mantle. Ice melt and sublimation are the main drivers of alcove growth, rather than sediment erosion.

Johnsson A.  Reiss D.  Zanetti M.  Johnson M. D.  Hauber E.  Hiesinger H.
Geologically Recent Debris Flows in a Well-Preserved Impact Crater, Mars: Insights from Terrestrial Analogs in Spitsbergen, Svalbard [#2541]
We compare the morphology of terrestrial debris flows analogs from Svalbard with pristine debris flows in an unusual crater environment on Mars and investigate the model of sieve-deposition for their formation.

Cedillo Y.  Craddock R. A.
Martian Gullies: Morphologies and Possible Processes in their Formation [#1331]
Martian gullies are often morphologically similar to terrestrial gullies and also appear young. The current environment on Mars does not support liquid water. Several processes may have been involved in their formation. At least some gullies were formed by dry mass wasting.
Rivera-Valentin E. G.  Chevrier V. F.  Ulrich R.  Roe L.  
*Effects of Freezing Point Depression on Martian Paleolake Stability [#1074]*
We model the freezing process and the effects of initial lake salinity on a martian paleolake, specifically observing the possible creation of a brine residue and its longevity.

Carvajal-Ortiz H.  Pratt L. M.  
*Influence of Salts and Clay Minerals on Stable Isotopic Signatures of Methane and Hydrogen Sulfide in Gas Hydrates [#2375]*
The origin of gases trapped within hydrates (e.g., methane) can be assessed by analyzing their stable isotopes. Here, we evaluate the use of stable isotopes of gases in hydrates as reliable source-signatures in the exploration for life beyond Earth.

Stillman D. E.  Grimm R. E.  
*Heterogeneous Adsorbed and Salty Liquid Water at the Phoenix Landing Site, Mars [#2578]*
Laboratory dielectric measurements were used to interpret the TACP data. These data are consistent with a salty (NaClO₄ and/or MgCl₂) liquid solution with a eutectic temperature near 239 K and the presence of adsorbed water in the regolith.

Leeman J. R.  Elwood Madden M. E.  
*Rapid Heat Induced Clathrate Dissociation Events — A Planetary Context [#1769]*
Heat induced dissociation of clathrates on planetary bodies is evaluated and constrained by experimental data. Bodies such as Mars, Titan, Eurpura, and Enceladus are believed to support clathrates and dissociation of clathrate could account for gas releases observed.

Gainey S. R.  Elwood Madden M. E.  Leeman J. R.  Guttery B. M.  
*Kinetics of Methane Hydrate Formation and Dissociation Under Mars Relevant Conditions [#2094]*
Methane hydrate formation and dissociation rates under Mars relevant conditions were determined through the differential method. The data will be used to evaluate the methane source on Mars.

Root M. J.  Elwood Madden M. E.  
*The Effects of Obliquity on Geothermal Gradients and Methane Hydrate Stability Zones on Mars [#2454]*
This work models the location of the methane hydrate stability zone using geothermal gradients on Mars. By examining the system kinetics, the potential volume of hydrate dissociated through temperature changes with obliquity can be better understood.

---

**FIELD AND LABORATORY ANALOGS FOR MARTIAN ALTERATION**

Vaniman D. T.  Bish D. L.  Chipera S. J.  Rearick M. S.  
*Relevance to Mars of Cation Exchange between Nontronite and Mg-Sulfate Brine [#2276]*
Nontronite with interlayer Ca, exposed to Mg-sulfate brine, produces a more Ca-enriched brine and a more Mg-rich nontronite. This is typical of smectites and Mg content of the clay mineral component of a sediment could be a record of brine exposure.

Golden D. C.  Koster A. M.  Ming D. W.  Morris R. V.  Mertzman S. A.  Graff T. G.  
*Experimental Acid Weathering of Fe-Bearing Mars Analog Minerals and Rocks: Implications for Aqueous Origin of Hematite-Bearing Sediments in Meridiani Planum, Mars [#2658]*
Here we report an experimental simulation of sulfuric acid weathering under hydrothermal conditions of Mars analog minerals, i.e., olivine, siderite, and rocks, i.e., olivine-rich basalt, to form minerals characteristic of meridiani outcrop.
Bullock M. A.  Moore J. M.  
*Laboratory Simulations of Mars Evaporite Geochemistry: Evaporation of Modern Brines Under Various Headspace Gas Mixtures* [#2823]
We report on laboratory experiments that generate Mars-analog evaporites under a modern-Mars gas mixture, and under a gas mixture with added acidic gases. Compositional differences show how atmospheric chemistry may influence the deposition and composition of evaporites on Mars.

McHenry L. J.  Chevrier V. F.  Schröder C.  
*Ephemeral K-Jarosite in a Saline-Alkaline Paleolake Deposit: Implications for the Long-Term Survival of Jarosite on Earth and Mars* [#1808]
Samples of a K-jarosite-bearing zeolitically-altered tephra from a saline-alkaline paleolake deposit collected in four different years show a decrease in jarosite abundance from 4.5% to 0%. Jarosite can be lost rapidly under appropriate conditions.

Merrison J. P.  Gunnlaugsson H. P.  Nørnberg P.  Knak Jensen S.  
*Wind Mediated Oxidation of Magnetite: A Putative Mechanism for Hematite Production on Mars* [#1681]
Experiments on magnetite (Fe₃O₄) to produce hematite (Fe₂O₃) under martian conditions are reported. Water and atmospheric oxygen are not involved in oxidation. The findings represent a putative mechanism for the reddish color of Mars.

*Pancam Visible/Near-Infrared Spectra of Fe-Ni Meteorite Oileán Ruaidh at Meridiani Planum, Mars* [#1929]
Pancam imaged the Fe-Ni meteorite Oileán Ruaidh on Sols 2367–2371. The surface is similar to other meteorites, with discontinuous coatings that exhibit reflectance spectra consistent with ferric oxides, suggestive of chemical weathering.

Elwood Madden M. E.  Keiser L.  Marra K.  Sorreghan G. S.  Stumpf A.  Hall B.  
*Chemistry of Sediments and Aqueous Fluids Produced by Chemical Weathering in Cold, Arid Systems* [#1500]
Analyses of Antarctic Dry Valley sediment and water samples suggest that cold, arid, glacial systems produce unique chemical and textural weathering products. High surface areas play a key role in the weathering process at these conditions.

Greenberger R. N.  Mustard J. F.  Kumar P. S.  Dyar M. D.  Speicher E. A.  Skulte E. C.  
*Weathering Products of Deccan Basalts and Implications for Mars* [#2548]
We characterized mineral signatures of an alteration profile of basalts with spectroscopy and then constrained our interpretations with laboratory measurements of mineralogy and chemistry to better understand alteration processes on Mars.

Gavin P.  El Senousy A.  Chevrier V.  Sayyed M. R. G.  Islam R.  
*Spectral Properties of Deccan Palaeosols, India: Implications for Thermally Altered Phyllosilicates on Mars* [#1905]
XRD and reflectance spectra of Deccan Palaeosols are compared to thermally altered phyllosilicates and used to help distinguish between altered and unaltered phyllosilicates on Mars.

Salvatore M. R.  Wyatt M. B.  Mustard J. F.  Head J. W. III  
*Development of Alteration Rinds on the Ferrar Dolerite of the Antarctic Dry Valleys: Initial Characterization* [#1479]
Rock surface alteration in Antarctica is a valuable analog to surface weathering on Mars. The chemistry and mineralogy of Antarctic alteration products are investigated with regard to the unaltered parent rock to investigate the alteration process.
Leach J. H. J.
*The Tuff Rings of South East Australia and the Surfical Deposits of Mars: A Cautionary Tale [#1020]*
The tuff rings of Australian maar eruptions can mimic many of the features normally considered to be typical of sediment deposits.

Bleamaster L. F. III  Wetz A.  Chuang F. C.
*Comparative Analysis of Mineralogic Signatures with Macro-Scale Morphology in Nili Fossae and Mawrth Vallis, Mars: Results from Geologic Mapping at 1:1 Million Scale [#2412]*
Geologic mapping will provide broad spatial and temporal context for isolated mineral signatures and a means to look for correlations between geology/morphology and mineralogy.

---

**Martian Fanclub**

Grant J. A.  Wilson S. A.
*Late Alluvial Fan Formation in Southern Margaritifer Terra, Mars [#2048]*
Crater statistics indicate that exposed alluvial fan deposits within craters in southern Margaritifer Terra likely formed in the Amazonian or near the Hesperian-Amazonian boundary.

*Sediment Fan Evolution and Hydrologic Activity in Mojave Crater, Mars [#1832]*
Catchment-fans with channel networks have been observed in Mojave Crater, Mars. We used a ~1-m resolution HiRISE DTM to look at fan formation processes and past water activity. We have observed geomorphology suggesting episodic water availability.

de Villiers G.  Hauber E.  Kleinhaus M. G.  Postma G.
*Fan-Shaped Deposits on Earth, Mars, and in the Laboratory [#1694]*
An investigative study of morphologic parameters (e.g. size, shape, gradient) of fan-shaped sedimentary deposits on both Earth and Mars, combined with comparison to analogue deposits that have been formed in the laboratory.

Morgan A. M.  Beyer R. A.  Howard A. D.  Moore J. M.
*Simulating the Formation of Large Alluvial Fans on Mars [#1584]*
Numerous alluvial fans have been identified in the southern martian highlands. We use a landform-evolution model to simulate growth of these fans to infer the prevalent local climatic conditions during their formation.

---

**Mars Fluvial Processes and Hydrology**

De Hon R. A.
*Hydrologic Provinces of Mars [#1447]*
A large-scale map of the hydrogeologic provinces of Mars provides insights into global drainage and sedimentation patterns.

Matsubara Y.  Gochenour J. P.  Howard A. D.
*Hydrology of Early Mars: Relative Channel Discharges from Depth of Valley Network Incision [#2602]*
Assessment of early Mars climate through analysis of valley incision depth.

deLano K.  Hynek B. M.
*Intracrater Layered Deposits Support Ancient Ocean on Mars [#2636]*
A majority of intracrater layered deposits on Mars are geographically and topographically close to the shoreline of a putative ocean. We argue that these deposits formed from a fluctuating water table during the time of an ancient ocean on Mars.
Atkins C. M.  Barlow N. G.  
*Investigating Indicators of Volatile-Rich Material in Arabia Terra, Mars* [*#1972*]

Arabia Terra impact craters display various morphologies suggesting the influence of subsurface and surficial volatiles. We are investigating the characteristics of these morphologies and what they imply about the role of H2O over Arabia Terra’s history.

Kostama V.-P.  Kukkonen S.  
*Analysis of the Upper Parts of Reull Vallis and the Morpheos Basin, Mars: Preliminary Results* [*#2408*]

The crater counts of the Morpheos basin floor at the eastern Hellas rim region imply that around 3.55 Ga ago the surface of the basin below the contour level of 500 m was modified by a resurfacing event, such as filling with water.

Warner N. H.  Gupta S.  Kim J.  Lin S.  Muller J.  
*Retreat of a Giant Cataract in a Long-Lived Catastrophic Outflow Tributary Canyon to Ares Vallis, Mars* [*#1420*]

In this analysis we posit that cataract initiation and retreat within a tributary canyon to Ares Vallis were triggered by drops in base level at its mouth, a direct result of incision of the main branch of Ares Vallis during long-lived episodic flooding within both systems.

Barnhart C. J.  Howard A. D.  Moore J. M.  
*The Influence of Cratered Slopes on Late-Noachian Valley Network Formation* [*#1983*]

We use a landform evolution model to explore the effects that regional slope and impact crater basins have on valley network formation and integration. We find that low regional slopes, and impact basins frustrate valley network formation.

Luo W.  Howard A. D.  Trischan J.  
*Estimating Incision Depth in Martian Valleys: Comparing Two Methods* [*#1418*]

Regional variation of valley network (VN) depths may be informative of past climatic variation across Mars. Both black top hat transformation and search radius approach provide reasonable estimates of VN depths, but require careful interpretation.

de Villiers G.  Postma G.  Kleinhans M. G.  
*Interpretation of Martian Delta Morphology and Processes Based on Experimental Work* [*#1784*]

We compare DTM data of Mars and of controlled laboratory experiments with a morphological model to infer sediment transport mode, surface processes, formative duration and climatic conditions at the time of formation.

*The Significance of a Mars Hydrograph: Shoreline Synthesis Constrained from Integrated Terrestrial Analog Studies* [*#2322*]

Interpretations of shorelines and landforms on Mars can be guided by terrestrial analog studies to generate a Mars hydrograph with the potential to provide a crucial planetary reference datum.

Goudge T. A.  Head J. W.  Mustard J. F.  Fassett C. I.  
*A Comprehensive Look at Martian Open-Basin Lake Morphology* [*#2131*]

Two hundred twenty-four open-basin lakes (OBL) are classified based on: 1) whether they have lacustrine deposits; and 2) what post-fluvial-activity process may have resurfaced them. 104 OBLs have possible lacustrine deposits; however, all 224 are resurfaced to some degree.

Parker T. J.  
*Sinuous Ridges in Peta Crater, Mars* [*#2776*]

Peta Crater (21°S,351°E) contains a system of sinuous ridges similar to, but smaller than, the well-known Dorsa Argyre and Dorsa Argentea ridges. Recent CTX and HiRISE images of the Peta crater ridges is enabling a detailed examination of this confined system of ridges.
A newly-identified paleolake basin on the western margin of the greater Argyre Basin and surroundings points to a potentially larger role for surface water and hydrogeomorphic processes in the early Noachian than previously discussed.

Treiman A. H.
An Effusive Dome on a Crater Wall Near Mawrth Vallis: A Possible Mud Volcano Near an MSL Landing Site [#1083]
The wall of an impact crater near Mawrth Vallis sports a dome, which looks like it formed by material erupted out of the crater wall. It may be a mud volcano, consistent with the widespread exposures of clays around Mawrth Vallis.

---

**MARS AEOLIAN PROCESSES: DUST, DEVILS, DUNES, AND ANALOGS**

Choi D. S. Dundas C. M.
Wind Measurements of Martian Dust Devils from HiRISE [#2344]
Martian dust devils / We track their clouds with software / Colorful wind plots.

Statella T. Silva E. A.
Dust Devils Detection and Inference of Their Movement Directions [#1001]
The paper shows an application of mathematical morphology to detect dust devils tracks and infer their main directions of movement.

Reiss D. Rossi A. P.
Seasonal Dust Devil Track Observations on Earth and Mars: Relationships to Atmospheric Dust Opacity [#2186]
We compared seasonal changes in dust devil track (DDT) density on Earth and Mars (Ténéré desert and Gusev Crater) to seasonal dust opacity values to constrain how the varying atmospheric aerosol content influences the formation and/or obliteration of DDTs on both planets.

Raack J. Reiss D. Hiesinger H.
Bright Dust Devil Tracks on Earth: Implications for their Formation on Mars [#1754]
We report on the first observations of bright dust devil tracks on Earth, observed in the Turpan depression in northwestern China, with microscopic in situ measurements and present a plausible model for their formation with implications for Mars.

Metzger S. Balme M. Pathare A. Renno N. Towner M. Spiga A. Elliott H.
High-Resolution Dust Devil Sampling for Sediment Loads, Wind Speeds, Temperature and Pressure Excursions [#2458]
This interim report on field activities using upgraded high-resolution instruments in Southern Nevada is part of a larger effort to understand dust devil formation, meteorological conditions, and the resultant dust-lifting efficacy they achieve.

Elliott H. Renno N. Williams E. Balme M. Metzger S. Pathare A. Rogacki S. Gillespie R. Musko S.
Diagnosing the Electrical Structure of Dust Devils [#2396]
This study is concerned with the vertical electrical structure of the dust devil, and ultimately with the physical mechanism for their electrification.
Reiss D.  Raack J.  Rossi A. P.
Formation of Dark Dust Devil Tracks in the Turpan Desert (China): Comparison with Mars [#2122]
We present results of the first in situ analysis of dust devil tracks in the Turpan desert (China) and compare them with Mars.

Zimmerman M. I.  Lewellen D. C.
Surface Marks: Diagnostic Footprints of Atmospheric Vortices [#1406]
Patterns of fine debris removal and deposition left behind by a vortex, or surface marks, contain signatures of the winds that created them. We have used large eddy simulations of debris-laden tornadoes to correlate simulated marks with winds aloft.

Fenton L. K.  Michaels T. I.
Mesoscale and Large Eddy Simulations of Dust Devils in Amazonis Planitia, Mars [#2718]
Mesoscale and large eddy simulations of summer daytime convective activity over Amazonis Planitia, Mars, suggest that the vigorous convection that produces the large number of dust devils observed may be enhanced by mesoscale interactions.

Pendleton Hoffer M.  Greeley R.  Wagstaff K. L.  Ansar A.
Transient Aeolian Features Detected Autonomously in HiRISE Images of El Dorado, Columbia Hills, Gusev Crater, Mars [#2425]
An algorithm developed for autonomous detection of albedo change in pairs of images was used to identify alterations to surface features in a small bedform, El Dorado, in Gusev Crater, Mars.

Michaels T. I.
Aeolian Phenomena at Nili and Meroe Paterae [#2697]
Active sand transport has recently been observed within Nili Patera by Silvestro et al. (2010). This work uses mesoscale modeling to elucidate the timing and spatial extent of atmospheric forces driving aeolian phenomena in that region.

Bowers L. M.  Putzig N. E.
Dune Morphology and its Effects on the Thermal Behavior of Olympia Undae [#2819]
We analyzed the morphologic patterns seen in Olympia Undae, Mars’ largest dune field, and assessed their effect on the thermal behavior of the region.

Coleman S. J.  Hayward R. K.
A Higher Resolution Update to Viking-Based Martian North Polar Dune Slipface Analyses [#1436]
We analyze wind directions in the martian north polar region as indicated by dune slipfaces seen in THEMIS–VIS imagery and compare our results to those from initial studies from the late 1970s based on Viking Orbiter 2 images.

Silvestro S.  Fenton L. K.
Present-Day Aeolian Activity in Arabia Terra. First Results from a Global Mapping of Active Dune Fields on Mars [#1482]
In this work we mapped active dark dune fields in Arabia Terra (Mars), finding evidence of widespread aeolian modifications. This suggests that sand saltation is a widespread process on the martian surface and is not limited to a few isolated cases.

Butcher A.  Fenton L.
Latitudinal Trends in Morphology and Classification of Southern Martian Dunes [#2091]
By studying dunes, it is possible to gain insight into the climate and sedimentary history of a region. Martian dune fields are likely regulated by many of the same aeolian, climatic, and sedimentary processes as terrestrial dunes.
Hayward R. K. Fenton L. K. Titus T. N.
*Mars Global Digital Dune Database: South Polar Region and Global Trends* [#1051]
The south polar portion of the Mars Global Digital Dune Database will add ~70,000 km² of mapped features to the
dune database. Global distribution of dune fields is uneven with 75% concentrated between 70°N and 90°N and 15%
between 60°S and 80°S.

Cardinale M. Komatsu G.
*A Comparison of Sand Corridors on Mars with a Terrestrial Analog* [#1235]
The aeolian features including sand corridors within the Moreux crater of Mars are likely resulted from wind
circulation influenced by the crater topography. The sand corridors in the crater were compared with those in the
Badan Jaran Desert, China.

Craddock R. A. Tirsch D. Nanson G. Tooth S. Langhans M.
*Analyses of a Large Climbing Dune in the Ka’u Desert, Hawaii and Implications for Understanding Dark Dunes on Mars* [#1441]
Our objectives are to (1) determine the history of basaltic dunes located in the Ka’u Desert of Hawaii, (2) ascertain
changes in the characteristics of basaltic sediments as they are transported, and (3) acquire the VNIR spectra of
these materials.

Shockey K. M. Zimbelman J. R.
*Transverse Aeolian Ridges as Seen in HiRISE Images Compared to Terrestrial Analogs* [#2081]
Using HiRISE images with photoclinometry, we quantified characteristics of TARs and compared them to
terrestrial analogs. Our study found differences between terrestrial dunes and ripples, and compared them to
our martian TAR results.

Scheidt S. P. de Silva S. L. Zimbelman J. R. Bridges N. Viramonte J. G.
*The Composition of Puna Gravel Ripple Fields: A Terrestrial Analog from TIR Remote-Sensing and Spectroscopy* [#2706]
Samples of gravel, sand and bedrock were collected from a terrestrial analog site for Mars granule ripples in the
Puna Desert. Analysis was undertaken using remote-sensing and spectroscopy.

de Silva S. L. Zimbelman J. R. Bridges N. T. Scheidt S. Viramonte J. G.
*The Coarsest Gravel Ripples on Earth? Preliminary Observations and Interpretations* [#2421]
Gravel megaripples in the Puna of Argentina are the coarsest yet to be described on Earth. They may be the best
terrestrial analogs for martian granule ripples. We present preliminary sedimentological and morphological data
and observations.

Lorenz R. D.
*Experiments in Timelapse Camera Observations of Dust Devil Activity at Eldorado Playa, Nevada* [#1573]
Ten thousand pictures / Show dust devils come and go / A new way forward.

---

**THE MEDUSA FOSSEAE FORMATION**

Scheidt S. P. Zimbelman J. R.
*Preliminary Geologic Map of the MC-16 NW Quadrangle, Mars: Subdivisions of the Lower and Middle Members of the Medusae Fossae Formation* [#2631]
This abstract describes the preliminary mapping results of the MC-16 NW quadrangle of Mars, where a large portion
of the area is a Medusae Fossae Formation (MFF). We look more in depth at the subdivisions of the MFF units.
Zimbelman J. R.  
Preliminary Geologic Map of the MC-23 NW Quadrangle, Mars: Lower Member of the Medusae Fossae Formation [1840]  
Mapping at 1:2 M scale reveals that MFF was once much more extensive in areal coverage than would be inferred from global mapping.

Kerber L.  Head J. W.  
A Progression of Induration in Transverse Aeolian Ridges: Evidence for Ancient Aeolian Bedforms and Extensive Reworking in the Medusae Fossae Formation [1628]  
Evidence of degraded bedforms in the Medusae Fossae Formation suggests that the deposit may undergo a recycling process whereby depositional features are indurated to the point where they may be eroded again, forming more depositional features.

Figueroa M.  Amara S.  Das S.  Nagarajan S.  Prasad T.  
Analysis of Patterns of Aeolian Processes in the Medusa Fossae Region [1249]  
The team proposes an indirect method to quantify the wind effects on Mars’ surface. We look to measure the dimensions of yardangs, to determine whether characteristics of aeolian processes are related to the characteristics of yardangs in the Medusa Fossae region.

Harrison S. K.  Balme M. R.  Hagermann A.  Murray J. B.  
Observation and Interpretation of an Inverted Channel Feature in the Middle Member of the Medusae Fossae Formation, Equatorial Mars [1691]  
We present new mapping and analysis of an unusual set of inverted channel features located on the central lobe of the Medusae Fossae Formation, centered at roughly 5°S, 179°E.

Lefort A.  Burr D. M.  Beyer R. A.  Howard A. D.  
Topographic Post-Formation Modifications of Inverted Fluvial Features in the Western Medusa Fossae Formation, Mars [2418]  
Topographic analyses of sinuous ridges in the western Medusa Fossae Formation (MFF) show gradients locally reversing direction of slope along the presumed flow direction, interpreted as indication of differential settling of the western MFF.

The Western Medusae Fossae Formation, Mars: A Possible Source for Dark Aeolian Sand [1582]  
Dark sand dunes are observed in the western Medusae Fossae Formation (MFF). The preponderance of data suggest that the MFF itself is the source of this sand.

---

**Martian Pits and Caves**

Cushing G. E.  
Visible Evidence of Cave-Entrance Candidates in Martian Fresh-Looking Pit Craters [2494]  
New HiRISE observations have revealed that internal characteristics of some “fresh-looking” pit craters are consistent with the presence of cave entrances. A possible formation process is discussed.

MacLennan E. M.  Cushing G. E.  Titus T. N.  
Preliminary Thermal Investigation of Fresh-Looking Pit Craters (FLPCs) [2539]  
We determine diameters and depths of “fresh-looking” martian pit craters, then account for subpixel mixing in 100-m thermal data and determine temperature differences between surface and pit floors. These data may reveal cave-entrance locations.
Newcomer K. B.  Moersch J.  Cabrol N. A.  Grin E.  Wynne J. J.  Chojnacki M.
Evaluation of a Proposed Technique for Identifying Martian Caves in THEMIS Infrared Images [#2739]
We present a proposed technique for identifying martian caves using THEMIS infrared images.

**Martian Impact Crater Statistics and Their Implications**

Using CTX-Based Crater Size-Frequency Distributions to Refine the Geologic History of Deuteronomous Mensae, Mars [#1206]
Using CTX imagery, crater size-frequency distributions were made for Deuteronomous Mensae, Mars, providing information on formation ages and the timing/nature of regional degradation. Results are consistent with geologic mapping and refine unit ages.

Berman D. C.  Crown D. A.  Joseph E. C. S.
Determining Erosional/Depositional History of Deuteronomous Mensae, Mars Using Categorized Crater Size-Frequency Distributions [#1435]
Categorized crater size-frequency distributions (SFD) of small craters (~25 m–1 km diameter) in Deuteronomous Mensae, Mars provide new insights into the erosional and depositional histories of geologic units as well as refinements of formation ages.

Calef F. J. III  Herrick R. R.  Sharpton V. L.
Global Distribution of Small Rayed Craters on Mars: Sequences of Ejecta Retention [#2555]
We quantify the spatial distribution of subkilometer diameter craters that still retain ejecta (i.e., “rays”) and develop an ejecta retention sequence for Mars. Global ejecta formation and retention processes are also discussed.

Berman D. C.  Hartmann W. K.  Balme M. R.
We update the current statistics on crater formation rates at small diameters and use the refined distribution to compare the behavior of small craters in ice-rich vs. ice-poor areas and show how these can be used to interpret geological processes.

Miller W. I.  Stepinski T. F.  Mu Y.  Ding W.
Cascading Crater Detection with Active Learning [#1469]
Our strategy for automatic crater detection consists of employing a cascading AdaBoost classifier for identification of craters in images, and using the SOM as an active learning tool to minimize the number of image examples that need to be labeled by an analyst.

Vinković D.  Salamuničar G.  Lončarić S.  Vučina D.  Gomerčić M.  Pehnec I.  Vojković M.  Hercigonja T.
Test-Field for Evaluation of Laboratory Craters Using Interpolation-Based Crater Detection Algorithm and Comparison with Martian Impact Craters [#1453]
A test-field for evaluation of laboratory craters was developed. This includes three-dimensional scanning, emplacement in MOLA and LOLA data, evaluation using interpolation-based crater detection algorithm, and comparison with martian impact craters.

Rodrigue C. M.
Nearest Neighbor Analysis, Regression, and Secondary Crater Prospecting on Mars [#1014]
This paper combines nearest neighbor analysis and regression to detect linearities among small craters in a martian region. This technique could help distinguish secondary from primary impacts at the subkilometer diameter range.
Saraiva J.  Pina P.  Bandeira L.
Revisiting the Hollows of Gusev — Preliminary Results [#1835]
This work describes the early stages of a study of the distribution of small craters on an area of the surface of Mars centered in the Gusev Crater.

Pedrosa M. M.  Nogueira J. R.  Silva E. A.
Application of Morphological Operators in Detection Impact Craters on Mars [#1987]
The objective of this work is to integrate techniques of digital image processing and remote sensing, aiming the automatic identification of martian surface craters by using mathematical morphology on digital images.

Skinner J. A. Jr.  Nava R. A.
Using Large Crater Clusters to Identify Potential Source Craters on Mars: Technical Methods and Science Applications [#2502]
We present the final technical methods behind a recently developed program that uses large crater clusters to identify potential source craters and summarize ongoing program applications for selected regions of Mars.

Barlow N. G.
Constraints on the Proposed Formation Models for Martian Central Pit Craters [#1149]
We are conducting a study of the distribution and characteristics of martian central pit craters. Based on an analysis of 1312 central pit craters, we find that the melt-drainage model is most consistent with our data.

Conway S. J.  Mangold N.  Ansan V.
Crater Shape Evolution with Latitude in Terra Cimmeria, Mars – Implications for Climate [#2174]
We present results from measuring crater wall profiles in the N, S, E and W directions from HRSC elevation data from 25–50°S. We find HRSC data perform better than MOLA data and there are significant trends in slope and curvature with latitude.

---

**GEOLGY OF MARTIAN IMPACT CRATERS AND BASINS**

Watters W. A.  Bell J. III  Calef F.  Golombek M.  Grant J.  Hayes A.  Li R.  Parker T.  Sullivan R.
Structure and Morphology of Santa Maria Crater, Meridiani Planum, Mars [#2586]
We use MER and HiRISE observations to examine rim elevation and planform, ray remnants, target fracture distribution, bedding attitudes, and the distribution of ejecta blocks to gain new insights into small-crater formation and modification on Mars.

Jodlowski P.  Gross C.  Wendt L.  Halbach P.  Neukum G.
Geologic/Geomorphologic Mapping of a Complex Impact Crater in the Northern Plains of Mars [#1899]
Detailed maps are needed to correlate hyperspectral data from CRISM with geomorphologic units. Here we map a phyllosilicate bearing crater in the northern plains of Mars.

Wulf G.  Poelchau M. H.  Kenkmann T.
Structural Trends in the Central Uplift of an Unnamed Martian Crater as an Indicator for Impact Direction [#1440]
Structural deformations in central uplifts of oblique impact craters could provide evidence for the impact direction. An unnamed martian crater was geologically mapped to confirm strike orientation as indicator for impact direction.

Mest S. C.  Weitz C. M.  Tornabene L. L.
Correlation of Low-Albedo Deposits on the Floors of Oudemans Crater and Southeast Noctis Labyrinthus [#2547]
HiRISE and CTX images reveal a unique series of deposits on the floor of Noctis Labyrinthus that appear directly related to Oudemans crater, possibly consisting of impact-melt-bearing deposits to the north and ejecta to the northwest of Oudemans.
*Pitted Deposits of Fresh Impact Craters* [2701]  
Model of formation of pits in pitted terrain of impact craters is presented.

Chojnacki M. Moersch J. Wray J. J.  
*HiRISE Analysis of the Western Rim of Endeavour Crater, Meridian Planum, Mars: Morphology, Composition and Topography* [2272]  
The Opportunity rover is currently en route to investigate the ~20-km diameter Endeavour Crater in Meridiani Planum. We present an analysis of Capes York, Tribulation, and Byron’s mineralogy and topography using HiRISE band ratios and DEMs.

Caudill C. Tornabene L. McEwen A. Wray J.  
*Crater-Exposed Intact Stratigraphy Blocks and Volcanogenic Origin* [2393]  
In this study, we strive to understand the geologic history of Mars through crater-exposed underlying stratigraphy with an emphasis on volcanogenic materials. These materials are evaluated using mineralogical, morphologic, and morphometric analyses.

Komatsu G. Cardinale M. Vaz D. A. Wray J. J.  
*Conical Features and Basin-Filling Deposits in Isidis Planitia, Mars* [1187]  
The formation of conical features in Isidis Planitia on Mars is linked with the emplacement of the basin-filling Ali unit. We investigated their relationship in terms of cone distribution, their relation to basin topography, and spectral properties.

Ivanov M. A. Hiesinger H. Erkeling G. Reiss D.  
*Geologic History of Isidis Planitia on Mars* [1191]  
We describe the morphology of the material units that make up Isidis Planitia, interpret their nature, give age estimates for the units, and, finally, outline the major steps in the geologic history of the region.

---

**IMPACT PROCESSES ON MARS: GEOLOGY, MINERALOGY, AND ALTERATION**

*Color Banding Within the Inner Rims of Craters in Meridiani Planum: Observations by the Opportunity Pancam and HiRISE* [2359]  
Light-toned bands near the tops of craters in Meridiani Planum observed by Opportunity and HiRISE are described. We discuss a possible diagenetic origin for these color bands and present results from Santa Maria Crater.

*Investigation on a Pyllosilicate-Bearing Crater in the Northern Plains of Mars* [1875]  
We investigate a ~50 km wide, complex impact crater in the northern plains of Mars for evidence of post impact hydrothermal activity.

Carter J. A. Poulet F. Loizeau D. Bibring J.-P. Murchie S.  
*Impact Craters as Probes to Investigate the Upper Crustal Hydrous Mineralogy on Mars* [2619]  
Impact craters on Mars studied using CRISM data yield evidence for a possible vertical structure in the upper crust hydrous mineralogy.

Rogers A. D.  
*Spectrally Distinct Crater Ejecta Materials in Tyrrhena Terra, Mars* [1310]  
Using TIR and NIR data, mineralogical compositions of spectrally distinct crater ejecta materials are compared with surrounding surface compositions. Considerations for alteration processes are discussed.
Quantin C. Flahaut J. Clenet H. Allemand P. Thomas P.  
Composition and Structures of the Subsurface in the Vicinity of Valles Marineris as Revealed by Central Uplifts of Impact Craters [2342]  
The central peaks of impact craters have been analyzed on both HiRise and CRISM data to reconstruct the subsurface structure of the vicinity of Valles Marineris.

Huang L.-C. Zhu M.-H. Ip W.-H.  
The Thorium Distributions of Hellas Basin, the Large Impact Crater of Mars [2018]  
We studied the Th content of Hellas with topographic and hydrological features, and hope to resolve related questions: the shift of the topographic and Th distribution boundaries, the geological processes experienced, or the effect of water leaching.

Petrologic, Elemental and Isotopic Characterization of Shock-Melted, Enriched Ultramafic Poikilitic Shergottite Northwest Africa 6342 [1612]  
This highly shocked ultramafic shergottite is the first such martian specimen with “enriched” compositional characteristics.

Schrader C. M. Cohen B. A. Donovan J.  
Ni, S, and Cl in EETA79001 Lithology C [2814]  
We investigate EETA79001 impact melt using S, Ni and Cl — all strong indicator elements of martian soil. If soil is a contributor to Lithology C’s S budget it should also contribute Ni and Cl. Our work suggests no soil component is necessary to explain the Lithology C composition.

Farah A. E. Min K.  
Phosphate (U-Th)/He Thermochronology of Zagami and ALHA77005 Martian Meteorites [2726]  
We performed multigrain (U-Th)/He dating for 248 phosphate grains from Zagami and ALHA77005 martian meteorites. The most reliable ages of 147 ± 38 Ma and 11 ± 6 Ma were determined for Zagami and ALHA77005, respectively.

Greshake A. Fritz J. Boettger U.  
Ringwoodite in the Martian Shergottite Dar al Gani 670: The Role of Shearing [1092]  
Lamellar ringwoodite is found in sheared olivine from the martian shergottite Dar al Gani 670. Composition and texture indicate diffusion-controlled heterogeneous nucleation of the ringwoodite along certain shear-induced defect planes in olivine.

MARS DATA ANALYSIS, PROCESSING, AND GLOBAL MAPPING

Completing the New Global Geologic Map of Mars [2265]  
We describe new and updated aspects of our mapping approaches, progress to date, current issues, and plans for completion.

Martian Lobate Debris Aprons: Compilation of a New GIS-Based Global Map [2294]  
Compilation of a new GIS-based global map of lobate debris aprons is underway to better understand the global inventory of these relict ice-rich features. We welcome contributions of GIS-based data from other investigators.
Whelley P. L.  Rosenburg M.  Glaze L. S.  Calder E. S.
Global Roughness Texture of the Moon and Mars [#2118]
Statistical measures of patterns in surface roughness are used to differentiate regional geomorphic units on the Moon and Mars. This new methodology, developed for differentiating terrestrial volcanic deposits, is tested on two global data sets.

Campbell B. A.  Putzig N. E.
Surface Roughness Maps of Mars Based on SHARAD Echoes [#1489]
SHARAD captures echoes from subsurface geologic layering with dielectric contrasts, but significant information on topographic roughness properties can also be recovered from the amplitude and time-delay characteristics of the initial surface echo.

Ivanov A.  Plaut J.  Gim Y.  Orosei R.  Cicchetti A.  Giuppi S.  Cartacchi M.  Noschese R.  Piccardi G.
Updated Algorithm to Remove Ionospheric Distortion from MARSIS Data [#1873]
We present a new algorithm to remove signature of ionosphere from MARSUS subsurface data, using a topographic clutter model. Subsurface data are now more consistent with MOLA DEM, especially in the polar regions. We also report on TEC analysis.

Walter S.  Kirk R.  McGuire P. C.  Neukum G.
Systematic Photometric Modeling for Correcting Topographic Shading Effects on HRSC Imagery [#2198]
We want to use orientation information of HRSC and the surface to derive a photometric model and compare it with the HRSC image. This model can then be used for several purposes, e.g. to correct the acquired image to standard lighting geometry.

Release of HiRISE Digital Terrain Models to the Planetary Data System [#1558]
HiRISE DTM’s are produced at 1 m/px and 2 m/px, depending on source image mode. The procedure used to create the DTMs and their associated orthoimages is described here, as well as the products being made available via the PDS starting in 2010.

Kim JR.  Lin SH.  Hong J. W.  Park D. I.  Yoon SY.  Kim YH.
Very High Resolution Martian Topographic Data Processing and Its Application for Virtual Reality Implementation [#1841]
It demonstrates how the modern photogrammetry and the visualization technician can reconstruct virtual martian surface. The DTMs and ortho imagery from stereo cameras were processed. Then the topographic data were indigested into a VR system to demonstrate the potentials.

---

**EXOBIOLGY**

Oehler D. Z.  Allen C. C.
The Search for Biosignatures on Mars: Using Predictive Geology to Optimize Exploration Targets [#1178]
Facies prediction on Mars can optimize the search for organic biosignatures by identifying localities in which organic-rich shales are likely, as such shales typically concentrate and preserve organics that are present in the environment.
Barge L. M.   Russell M. J.   Kanik I.  
*Precipitation Patterns of Iron Minerals in a Chemical Gradient: A Laboratory Analog to Hydrothermal Environments on the Early Earth* [1099]  
We investigated iron mineral precipitation along redox/pH gradients in silica gels, to study mineralization in a chemical gradient. This work is applicable to a putative origin of life in alkaline low-temperature hydrothermal environments.

*Astrobiology and Habitability Studies Supporting Mars Research and Missions* [1762]  
During EuroGeoMars 2009 campaign, we characterized the mineralogy, organic compounds and microbiology of selected samples from different geological sites, and established correlations (Special Issue: “Astrobiology field research in Moon/Mars analog environments”: IJA 2011).

Schuerger A. C.   Britt D.  
*Hypobaric Conditions Within Rock Void Spaces on Mars will Likely Inhibit the Replication of Terrestrial Microorganisms* [1976]  
Internal void spaces within rocks outgas rapidly under simulated martian conditions. Water activity and pressure within rock void spaces are not sufficient to permit the replication of terrestrial microorganisms from spacecraft on Mars.

Dartnell L. R.   Storrie-Lombardi M. C.   Muller J.-P.   Griffiths A. D.   Coates A. J.   Ward J. M.  
*Implications of Cosmic Radiation on the Martian Surface for Microbial Survival and Detection of Fluorescent Biosignatures* [1977]  
We report experimental results on the survival of microbial life exposed to cosmic rays on Mars, building on our computer modeling of this ionizing radiation. On-going work is on the irradiation degradation of detectable fluorescent biosignatures.

Pavlov A. A.   Caffrey M.   Getty S.   Johnson C. S.  
*Formation of Liquid Water in the Shallow Subsurface Under Simulated Martian Conditions* [2480]  
We discovered formation of liquid water films in the simulated martian shallow subsurface environment. Liquid/mobile water is present even though in some runs the atmospheric pressures were kept below the triple point of water.

Ponce A.   Beaty S. M.   Lee C   Noell A. C.   Stam C. N.   Connson S. A.  
*Microbial Habitat on Kilimanjaro’s Glaciers* [2645]  
Kilimanjaro glaciers captured a history of microbial diversity and abundance of supraglacial habitats. We show that a majority of bacterial clones, as determined by bacterial 16S rRNA gene sequencing, are most closely related to those isolated from cold-water environments.

Yakovlev V. V.  
*The Hydrolaccoliths of Holden Crater — The Possible Storage of Life Traces* [1115]  
The possibility of life trace search on a surface of the degrading hydroloccaliths which were formed by a injection of underfrost waters is considered.

*Microbial Diversity of Active Layer Soil from the Canadian High Arctic* [1357]  
We present bacterial and archaeal diversity in active layer soil from the Canadian high Arctic using a high-resolution pyrosequencing analysis. The predominant bacterial group is related to *Proteobacteria* (37.7%) and *Bacteroidetes* (30.0%).
Marnocha C. L.  Chevrier V. F.  Ivey D. M.
*Growth of Sulfate-Reducing Bacteria in Sulfate Brines and the Astrobiological Implications for Mars* [#1604]
We suggest sulfate-reducing bacteria as a model for life on Mars, as sulfate brines have been shown to be stable in martian conditions. We have performed experiments to determine the survivability of these bacteria in high sulfate concentrations.

Kodama T. K.  Genda H. G.  Abe Y. A.  Zahnle K. Z.
*Evolution from Ocean Planet to Land Planet by Water Loss: The Inner Edge of Habitable Zone* [#2132]
We discuss the inner edge of Habitable Zone and imaginary planetary evolution from ocean planet to land planet by focus on water loss. When such evolution occur, planets keep habitable. We demonstrate the possibility of the various type of habitable planets.

Williams A. J.  Sumner D. Y.
*Geobiology of Acid Saline Systems: Implications for the Development and Preservation of Mineralogic Biosignatures on Mars* [#2125]
This study investigates 1) the role of biology in acid-saline mineral weathering and 2) biosignature preservation to document biosignatures present in terrestrial gossans that can aid in interpreting features observed by Mars Science Laboratory.

Burchell M. J.  Solscheid S.  Price M. C.  Josse L.  Adamek N.  Cole M. J.
*Survival of Yeast Spores in Hypervelocity Impacts Events up to Velocities of 7.4 km sec$^{-1}$* [#1759]
Survival of yeast spores in hypervelocity impacts is reported in experiments at speeds up to 7.4 km/s (corresponding to peak shock pressures of around 30 GPa).

Miura Y.  Tanosaki T.
*Formation of Nano-Bacteria-Like Flow Textures Formed at Oxygen-Rich Air Condition of Shock Wave Reaction* [#1692]
Nano-flow textures with irregular shapes are obtained by shock impact on carbon-fibers with oxygen-rich air condition (not at vacuum condition), which are different with nano-bacteria texture of the martian meteorite with regular nano-flow textures.

*Nitrogen Concentrations and Isotopic Compositions of Altered Terrestrial Glassy Basaltic Rocks, and Implications for Astrobiology* [#2500]
We report N contents and isotopic compositions of modern and ancient subaqueous basaltic rocks, discuss the biotic and abiotic processes generating these N signatures, and speculate on the implications for preservation in extraterrestrial materials.

*Carbon Isotope Measurements of Experimentally-Derived Hydrothermal Mineral-Catalyzed Organic Products by Pyrolysis-Isotope Ratio Mass Spectrometry* [#2311]
We report a new pyrolysis technique to extract and measure C isotopes of low-molecular weight mixtures of solid-phase hydrocarbons and intermediary products produced during high-temperature and high-pressure synthesis on mineral-catalyzed surfaces.

*Investigating the Role of Iron Sulfides in the Hydrothermal Vent Model for the Emergence of Life* [#1087]
We describe the results of fabrication and analysis of iron sulfide precipitated chimney-like structures under anoxic hydrothermal conditions as a step toward understanding the structure and surface chemistry bringing about the emergence of life on any wet, rocky planet.
The O/OREOS nanosatellite is the first demonstration flight mission of the NASA Astrobiology Small-Payloads Program (ASP). Successfully launched on Nov. 19, 2010 to a 650-km Earth orbit, the spacecraft operates nominal and records first science data.

Westall F. Pullan D. Bost N. Ramboz C. Foucher F. Mars-Analogue Rock Collection Team

Mars Exobiology Mission 2018 (MAX-C/ExoMars) and the Mars Analogue Rock Collection at the OSUC, Orléans [#1346]
The Orléans-OSUC analogue rock collection and database contains well characterised igneous, sedimentary, and hydrothermal rocks and minerals for use in instrument testing and in situ missions and specifically the 2018 Max-C/ExoMars mission.

Cousins C. R. Griffiths A. D. Crawford I. A. Prosser B. J. Coates A. J.

Selection of the Geological Filters on the ExoMars PanCam Instrument [#1826]
ExoMars has the key objective of looking for evidence of life on Mars. The rover will be equipped with a panoramic camera which will image the martian geological terrain via 12 narrowband ‘geology’ filters, the wavelengths of which are presented here.

Tsou P. Brownlee D. E. McKay C. P. Spilker L. Beegle L. W. Kanik I.

LIFE: Enceladus Sample Return Mission Concept for Searching Evidence of Life [#2478]
LIFE is an extremely rare mission opportunity: it offers comparable Flagship level science but at a low flyby sample return cost via a Discovery or New Frontiers mission.

---

**IGNEOUS PROCESSES: LAVAS, VOLCANOS, AND GEOCHEMISTRY**

Dufek J. Telling J. Manga M.

Multiphase Explosions on Mars: Numerical Studies of Phreatomagmatic Blast Dynamics [#2237]
The landforms generated during phreatomagmatic events on Mars provide clues to both the magmatic and environmental conditions in the near surface. We study the dynamics of these explosions for different atmospheric conditions.


Identifying Lava Tubes and Their Products on Olympus Mons, Mars and Implications for Planetary Exploration [#1805]
Olympus Mons displays a vast lava tube network. We present a group of morphologic criteria used to identify these features. Observing a combination of these morphologies is important as all can form individually through non-lava tube processes.

Brož P. Hauber E.

A Unique Volcanic Field in Tharsis, Mars: Monogenetic Cinder Cones and Lava Flows as Evidence for Hawaiian Eruptions [#1379]
We describe the morphology and morphometry of a unique volcanic field in Tharsis, Mars. The landforms are interpreted as well-preserved cinder cones and associated lava flows. We infer that they were formed by Hawaiian eruptions.

Farrell A. K. Lang N. P.

Continued Mapping of Apollinaris Mons, Mars [#2361]
We continue our mapping of Apollinaris Mons and its associated crater, Apollinaris Patera. We have determined a basic geologic history of the volcano, and will use crater counting and volume estimates to elaborate on our prior results.
An Overview of the Volcanic Evolution of Amphitrites Patera, Mars

A brief overview of the volcanic history and evolution of Amphitrites Patera.

Geological Evidence for a Migrating Tharsis Plume on Early Mars

Geological evidence suggests that the plume responsible for the largest igneous province in the solar system, Tharsis, migrated from near the south pole to its current location on the equator about 3.7 Ga, consistent with recent modeling efforts.

The Formation History of Olympus Mons from Paleo-Topography

We use lava flows on the flanks of the flexural trough surrounding Olympus Mons to reconstruct the history of volcanic loading and flexure. We constrain the eruption history and rates using paleo-topography, flexural modeling, and crater counting.

Eruption History of the Elysium Volcanic Centre, Mars

We present the first eruption frequency record for a volcanic centre on Mars. Based on our data, it is probable that Mars is still active in the Elysium region.

An Examination of the Contact Between Apollinaris Patera and the Medusae Fossae Formation, Mars: Implications for Apollinaris' Volcanic Evolution

We examine the contact between Apollinaris Patera and the Medusae Fossae Formation (MFF) on Mars with the goals of better understanding (1) the timing between Apollinaris and the MFF and (2) the volcanic evolution of Apollinaris Patera.

A Volcanic Origin for the Outflow Channels of Mars: Key Evidence and Major Implications

Available data support volcanic origins for the outflow channels of Mars. Volcanic interpretations are of significance to the study of Mars geology and climate history, and the study of ancient igneous processes on bodies of the inner solar system.

Tharsis Formation from Density Driven Thermo-Chemical Plumes During Planetary Differentiation

We propose a new model for Tharsis formation as a thermo-chemical plume that forms during differentiation processes on Mars. Fluid experiments using liquid gallium suggest a buoyant anomaly may postdate a Borealis-sized impact and core-forming event.

The Dynamics of Pyroclastic Density Currents on Mars: Implications for Interpreting Martian Surface Deposits

We've developed a model that predicts runout distance, sedimentation rate and bedform wavelength with distance from source under Mars conditions. Results show longer runout distances and bedform wavelengths on Mars due to slower sedimentation rates.

Modelling Subsidence due to the Olympus Mons Load Using Paleo-Slope Indicators

We study lava flow orientations on the smooth plains around southern Olympus Mons, determining differences between paleo-flow directions and the current downhill, and comparing to flexure models to constrain edifice and lithosphere properties.
Diniega S. Smrekar S. E. Anderson S. Stofan E.  
*Lava Flow Dynamics Driven by Temperature-Dependent Viscosity Variations* [#1538]

Pahoehoe flows begin as a uniform sheet then develop preferred flowpaths. We model the formation of dynamics-driven flow “fingers” caused by viscosity variations, which arise from differences in temperature and crystallization or volatile content.

Byrne P. K. Holohan E. P. Kervyn M. van Wyk de Vries B. Murray J. B. Troll V. R.  
*A Sagging-Spreading Continuum for the Structure of Large Volcanoes on Terrestrial Planets* [#2791]

We use a series of scaled analog models to develop a sagging-spreading continuum for large volcanoes, into which we place natural examples from Earth and other planets based on their surface structures.

Kerber L. Head J. W. Madeleine J.-B. Forget F. Wilson L. Levine J. S.  
*Explosive Volcanic Eruptions into the Martian Atmosphere: Tracking Ash and Water Ice* [#2015]

The combination of a Mars global circulation model and an explosive volcanic eruption plume model is used to track the dispersal of ash and water vapor into the martian atmosphere during a volcanic eruption.

de Moor J. M. King P. L. Sharp Z. D. Fischer T. P.  
*A Model for Sulfur Speciation and Sulfur Isotope Fractionation During Magmatic Degassing on Earth and Mars* [#1238]

Our model results suggest that (1) H2S and S2 are the main S gases exsolved from martian magmas, (2) degassing fractionation cannot explain the range in $\delta^{34}$S of martian meteorites, and (3) the $\delta^{34}$S value of the bulk martian surface is ~0 to +2‰.

*Sulfides from Martian and Lunar Basalts: Comparative Chemistry for Ni, Co, Cu, and Se. Average Sample Analyses and WDS Mapping of Grains* [#1007]

This study examines the average trace element chemistry for planetary sulfide grains from the Moon and Mars to provide a means of distinguishing samples from those bodies based on sulfide trace element chemistry.

Burger P. V. Shearer C. K. Papike J. J. Le L. Jones J. Sutton S. R. Newville M.  
*An Experimental Study of the Effects of Plagioclase Crystallization on REE Behavior and Eu Valence Oxybarometry in Pyroxene* [#1173]

This study characterizes the effect of plagioclase crystallization on pyroxene REE chemistry and the interpretation of the pyroxene oxybarometer.

Martin A. M. Righter K. Keller L. P. Médard E. Devouard B. Rahman Z.  
*Fayalite Oxidation Processes: Experimental Evidence for the Stability of Pure Ferric Fayalite?* [#2716]

We report experimental results on the stability of pure Fe$^{3+}$ fayalite end-member and on fayalite oxidation processes, using microscopic and nanoscopic analyses.

Teng F.-Z. Dauphas N. Helz R. T. Gao S. Huang S.  
*A New Petrogenetic Tool Based on Kinetic Isotope Fractionation Associated with Mg-Fe Interdiffusion in Olivine* [#2660]

Kinetic isotope fractionation during Mg-Fe interdiffusion in zoned olivine can be used to constrain the nature of mineral zoning in igneous and metamorphic rocks.
**PLANEATARY DIFFERENTIATION**

Danielson L. R.  Righter K.  Newville M.  Sutton S.  Choi Y.  Pando K.  
*Moobydenum Valence in Basaltic Silicate Melts: Effects of Temperature and Pressure [#2609]*  
Mo valence was determined using XANES for a suite of basaltic experimental run products, from 1 bar experiments at varying /O2, to high pressure runs from 10 kbr to 24 GPa. At pressures and temperatures relevant to core formation, Mo occurs as 3+.

*Simultaneous Experimental Determination of Metal-Silicate Partitioning of W, Mo, Ru, Pt and Pd Using Natural Abundances, Elevated P-T and Isotopic Tracers [#1727]*  
Metal-silicate distribution coefficients were determined at 10 kb and 1550 C for W, Mo, Ru, Pt and Pd using synthetic metal that had been isotopically modified.

Futó P.  Guesik A.  
*Carbon Planet Model with SiC Mantle Compound [#1227]*  
The existence of a carbon planet is highly probable by reason of astrophysical consideration. For the case of the same mass and core mass fraction (CMF) ratios their diameters are slightly larger than that of a terrestrial planet.

Takeda H.  Yamaguchi A.  Hiroi T.  Nyquist L. E.  Shih C.-Y.  Ohtake M.  Karouji Y.  Kobayashi S.  
*Comparisons of Mineralogy Between Cumulate Eucrites and Lunar Meteorites Possibly from the Farside Anorthositic Crust [#1632]*  
We compared the mineralogies, reflectance spectra of the cumulate eucrites, Y-980433 and Y-980318, to those of the Dhofar 307 lunar meteorite of the Dhofer 489 group, to gain a better understanding of the feldspathic farside highlands and the Vesta-like body.

Castillo-Rogez J. C.  Lunine J. I.  Johnson T. V.  
*How Differentiated is Callisto? [#2580]*  
In our model, Callisto has differentiated an icy shell and rocky core, and in the latter a large fraction of the accreted water is stored in the form of water of hydration. This model is consistent with the observed moment of inertia.

**PLANEATARY DYNAMICS AND TECTONICS**

Rivoldini A.  Van Hoolst T.  Verhoeven O.  Mocquet A.  Dehant V.  
*Constraints on the Interior Structure and Composition of Mars from Geodesy [#2178]*  
We use the recent geodesy data of Konopliv et al. 2010 to constrain the composition and interior structure of Mars. The data is consistent with Mars having a molten core of radius 1794±65km and a core sulfur concentration of 16±2 wt%.

Pithawala T. M.  Ghent R. R.  Bills B. G.  
*Modeling the Internal Structure of Mars Using Normal Mode Relaxation Theory [#1549]*  
Mantle and core viscosity structure of Mars, using normal mode relaxation theory.

Toyokuni G.  Ishihara Y.  Takenaka H.  
*Preliminary Modeling of Global Seismic Wave Propagation in the Whole Mars [#1631]*  
Global seismic wave propagation in the whole Mars is simulated by an accurate and efficient numerical scheme which has been developed for the Earth. Simple Mars models are used to obtain preliminary results of martian seismic waveform modeling.
Impact-Induced Mantle Dynamics on Mars [1205]
Heating of the martian mantle by a large basin-forming impact (e.g., Utopia) drives long-lived degree-1 mantle convection with the upwelling beneath the impact site. The heat flux recovers fastest if the impact occurs over a preexisting upwelling.

3D Modeling of Melting History of the Martian Mantle [2057]
The formation of Tharsis rise places a constraint on the timing of melt production and thus, the thermal history of Mars. The temperature-dependent, stagnant lid models in 3D produce similar plume structures to Kiefer’s axisymmetric model.

Martian Dichotomy Formation by Partial Melting Coupled to Early Tharsis Migration [2366]
We investigate the effect of partial melt residue stiffening on the plume-lithosphere dynamics on Mars, in order to further test a self-consistent endogenic model of dichotomy formation by partial melting and the subsequent Tharsis evolution.

Degassing of the Martian Mantle and Its Effects on the Thermal Evolution and Magnetic Field History [2566]
We analyze the effect of water concentration on martian thermal evolution. This parameter controls the convection intensity and the heat removal process. Results show how degassing history affects the early magnetic field lifespan on the planet.

Strength Contrast between Plagioclase and Olivine: Implication for Rheological Layering in the Terrestrial Planets [1251]
We performed an experiment to directly determine the relative strength between plagioclase and olivine without any extrapolating of flow law and evaluated rheological variation in the crust-mantle transition of terrestrial planets.

Deformation of Olivine Single Crystals in a Hydrous Environment: Insight into the Rheological Behavior of the Lithospheric Mantle of Terrestrial Planets [2273]
Deformation of olivine demonstrates that viscosity decreases with increasing water fugacity and decreasing silica activity, consistent with point defect models in which water is incorporated into olivine as defect associates involving Si or Me vacancies with H ions.

Spatial Variability of the Martian Crustal Magnetic Field [2621]
The crust of Mars retains heterogeneous remanent magnetism. Magnetic power spectra can provide constraints on the depths and strengths of magnetic sources. We use a spatiospectral windowing approach to map local variability across the planet.

Inversion of Gravity and Magnetic Field Data for Tyrrhena Patera [2243]
We model the gravity and magnetic field data for Tyrrhena Patera and the surrounding area to infer the magnetization history.
Lillis R. J.  Dufek J.  Kiefer W. S.  Karlstrom L.  Bleacher J. E.  Manga M.
**Magmatic Intrusions Beneath Martian Highland Volcanoes: Clues from Eruptive History, Thermal-Magnetic-Gravity Modeling and Electron Reflectometry** [#2180]
Gravity and magnetic field measurements imply that the magma chamber beneath Tyrrhena Patera partially demagnetized surrounding crust, while the larger magma accumulation at Syrtis Major completely demagnetized 10,000s of square kilometers of crust.

Cheung K. K.  King S. D.
**Using Crustal Thickness Modeling to Study Mars’ Crustal/Mantle Structures** [#1534]
Mars’ topographic dichotomy divides the planet into two distinct hemispheres. By using the gravitational potential of Mars and integrating it with topography, we can study the interior structure of the planet with a crustal thickness model.

Yin A.
**Impact-Induced Subduction and Slab Rollback for the Tectonic Origin of the Tharsis Rise on Mars** [#1525]
To explain Tharsis evolution, I propose that its volcanism and graben development were induced by slab rollback of a southeast-dipping plate. Subduction was initiated near Syria Planum by early Hesperian volcanic flooding, possibly triggered by the Argyre impact.

Davis B. J.  Andrews-Hanna J. C.
**Flexural Response to Sediment Erosion and Unloading at Valles Marineris, Mars** [#2557]
Models of the Valles Marineris formation have difficulty accounting for the observed gravity and topography surrounding the troughs. We show that these features can be explained by lithospheric flexure in response to the erosion of ancient sediments.

Williams N. R.  Pritchard M. E.  Bell J. F.  Watters T. R.  Banks M. E.  Robinson M. S.  Tran T.
**Two Tectonic Landforms from Lunar Reconnaissance Orbiter Camera Digital Terrain Models** [#1624]
Topography derived from Lunar Reconnaissance Orbiter Camera (LROC) stereo images provides new insights and constraints on the mechanics and kinematics of contractional tectonic landforms on the Moon.

Runyon K. D.  Davatzes A. K.  Davatzes N. C.
**Structural Characterization of the Cerberus Fossae at the Athabasca Valles Source Region, Mars** [#1913]
The Cerberus Fossae displacement profiles and surface expression are consistent with a normal fault interpretation. Mechanical interaction of fossae segments is indicated by displacement profiles and fracture intensity measurements.

Birnie C.  Fueten F.  Stesky R.  Hauber E.
**Underlying Structural Control of Small Scale Fault and Fracture Orientations Viewed in HiRISE Images Within West Candor Chasma, Mars** [#1488]
Small-scale fault and fracture orientations measured within HiRISE images of West Candor Chasma display a clear relationship with large-scale underlying chasma-forming faults and potentially identify additional chasma-forming structures.

Vaz D. A.  Barata M. T.  Alves E. I.
**Transtension in Thaumasia Planum: Evidences for a Coprates Rise Oblique Transfer Zone** [#1105]
An automatic method for strain assessment was applied to a rift located in Thaumasia Planum. A transtensive regime for the rift formation was confirmed. The presented strain analysis gives a better perspective of the kinematics of the rift.

Raitala J. T.  Kostama V.-P.
**Marker Strata and the Light Blocks on the Floor of Ius Chasma** [#1062]
A marker layer divides stratified blocks on the floor of Ius Chasma into light-gray and darker-gray units with numerous cross-cutting strike-slip faults. The blocks probably originated from the rim of Ius Chasma.
Beuthe M.  Rivoldini A.  Dehant V.  
Only 3 Spatial Patterns of Tidal Heating [#2279]
We show that the spatial pattern of tidal dissipation within a body can be factorized into three basic patterns multiplied by radial functions that depend on the internal structure.

Rhoden A. R.  Hurford T. A.  Manga M.  
The Contribution of Io-Raised Tides to Europa’s Diurnally-Varying Surface Stresses [#2241]
We show that the daily tidal distortion of Europa by Io is non-negligible compared to that of Jupiter. Io’s contribution is likely large enough to affect tidally-driven fractures especially if obliquity is also included.

Bland M. T.  McKinnon W. B.  
The Importance of Brittle Deformation in Models of Icy Satellite Tectonics [#2482]
Models of tectonics provide insight into planetary evolution, but particular care must be used when simulating brittle deformation of the lithosphere. We describe a case study that illustrates the uncertainties involved.

Patterson G. W.  Ernst C. M.  
Modeling Plate Motion on Europa: Phaidra Linea [#2102]
We are using plate motion modeling to determine the presence and magnitude of non-rigid behavior present within a complex system of plates on Europa defined by the prominent band Phaidra Linea.

Malaska M.  Radebaugh J.  Le Gall A.  Mitchell K.  Lopes R.  Wall S.  
Evidence for an Eroded Upwarp Near Sikun Labyrinthus, Titan [#1567]
From an analysis of valley and channel patterns observed by synthetic aperture radar (SAR) during the T39 flyby, evidence for an eroded regional upwarp on Titan is described. A putative evolution sequence will be presented.

Barr A. C.  
Strain History of the Ice Shells of the Galilean Satellites from Radar Sounding [#2212]
Crystal orientation fabric, indicative of strain history, can cause radar reflections in terrestrial ice sheets. I show that fabric can form and be detected in the Galilean satellites, providing a way of testing hypotheses about ice shell geology.

Martin E. S.  Kattenhorn S. A.  
Crater-Fracture Interactions on Enceladus: The Control of Crater Size on Perturbations of Fracture Growth [#2666]
On Enceladus, we aim to understand localized changes in fracture orientation seemingly caused by local perturbations in the stress field by craters within the cratered terrains, and whether or not these changes are dependent on crater size.

Gifford P. K.  Yoshinobu A. S.  
Geometry and Kinematics of Structures in the South Polar Terrain of Enceladus: Over-Interpreting Kinematics? [#2734]
Evidence suggests that the south polar terrain of Enceladus, specifically the “tiger stripes,” has been formed by both extensional and shear forces, as well as compression.

Giese B.  Helfenstein P.  Hurford T. A.  Neukum G.  Porco C. C.  
Observation of Cycloidal Features on Enceladus [#2007]
We observe geologically young cycloidal segments in different places on the surface of Saturn’s moon Enceladus. From these we conclude that there must have been (or still is) a fluid subsurface layer, potentially a global subsurface ocean.
Walker C. C.  Bassis J. N.  
*On the Formation of a South Polar Basin in the Ice Shell of Enceladus* [1719]
Enceladus' topography suggests that the SPT region could have formed in the style of a basin on the Earth. The McKenzie Model for basin formation (McKenzie, 1978) on the Earth and knowledge of terrestrial ice is applied to the Enceladus setting.

Manga M.  Wang C.-Y.  Rudolph M. L.  
*Pressurized Oceans, Cracking the Ice Shell, and the Eruption of Liquid Water on Enceladus* [1138]
We calculate the pressure in an ocean produced by freezing of the overlying ice shell. We find that for reasonable tensile strengths of ice, and shells less than a few tens of kilometers thick, the entire shell can crack and liquid water could erupt onto the surface.

Beddingfield C. B.  Yoshinobu A. S.  
*Features Analogous to Ice Streams and Ice Rises on Enceladus’ Leading Hemisphere: Indicative of Subsurface Water?* [2737]
The leading hemisphere of Enceladus contains a variety of features that we suggest are analogous to terrestrial ice streams. These features may indicate the presence of a large amount of subsurface water during the time of their formation.

---

**LUNAR IMPACTS: TIMING, MORPHOLOGY, AND TECTONICS**

*Multi-Ring Basins: Where and How to Best Determine Their Structure* [1445]
From a total of 53 lunar basins, those best suited for determining multiring basin structure were identified based on age, certainty, and number of rings.

Wood C. A.  Collins M. J. S.  
*New Light on Old Basins* [1314]
Great resolution and homogeneity of LRO WAC mosaics and LOLA altimetry suggest that Moscoviense sits in an older basin, explaining its thin crust and mare lavas, Orientale and SPA overlap older basins, and Wilhelms and McCauley were right about Imbrium.

Kalynn J.  Johnson C. L.  Osinski G. R.  Barnouin O.  
*Topographic Characterization of Complex Lunar Craters with LOLA Data* [1514]
We characterize the topography of fresh lunar craters in the diameter range 15–110 km using LOLA data.

Byrne C. J.  
*Absolute Zircon Ages for Pre-Nectarian Events and a Proposed Age for the Near Side Megabasin* [1518]
The pattern of zircon ages from samples from two different Apollo landing sites is used to infer ages for pre-Nectarian basins, including the nearside megabasin. This is of interest to the study impacts, mineralogy, and pre-Nectarian history.

Sori M. M.  Zuber M. T.  
We use LOLA data to compute depth-to-diameter ratios of large lunar impact structures (>60 km in diameter) in both the SP-A basin and the lunar highlands in order to investigate how subsurface structure affects crater morphology.

Aldridge T. M.  Thomson B. J.  Stoddard P. R.  Cahill J. T. S.  Bussey D. B. J.  Mini-RF Science Team  
*A Mini-RF Radar Analysis of the Moon’s South Pole-Aitken Basin* [1883]
Using Mini-RF S-band zoom we derive the Stokes (S1), and circular polarization ratio (CPR) parameters of the South Pole-Aitken basin. From global Clementine UVVIS-NIR data, we derive estimated TiO2 and FeO maps for comparison with radar data products.
Lunar South Pole-Aitken Basin from Kaguya (SELENE) Gravity/Topography \[\#1893\]
We use gravity/topography by Kaguya to study the structure of South Pole-Aitken basin (SPA). The region with thinner crust is offset from SPA center. This implies the oblique impact origin of SPA. Small impact basins in SPA are also analyzed.

Gibson K. E. Jolliff B. L.
Correlation of Surface Units and FeO Concentrations in the South Pole-Aitken Basin Interior \[\#2326\]
We used Clementine UV-VIS data and LP-GRS data in order to examine if a correlation exists between FeO concentrations in the mapped mare, cryptomare, and nonmare units surrounding Bose and Bhabha craters in the South Pole-Aitken Basin interior.

Jolliff B. L. Gibson K. E. Scholten F.
South Pole-Aitken Basin Interior: Topographic Expression of Mare, Cryptomare, and Nonmare Plains Units \[\#2774\]
We use LRO Camera images and digital topographic models, derived from LROC images, to distinguish mare, cryptomare, and nonmare plains units in the deep interior of South Pole-Aitken Basin and to assess the thickness of nonmare ejecta deposits.

Ishihara Y. Morota T. Nakamura R. Goossens S. Sasaki S.
Was the Moscoviense Basin Formed by Double-Impact? \[\#1124\]
We measured and considered surface and subsurface structure of the Moscoviense basin based on Kaguya selenodetic data. We propose a new hypothesis called “double-impact formation” of the Moscoviense basin.

The Moscoviense Basin: Insights into an Atypical Basin \[\#2574\]
We explore the unusual ring configuration of the Moscoviense Basin as well as reexamine the mare units on the basin floor.

Andrews-Hanna J. C. Stewart S. T.
The Crustal Structure of Orientale and Implications for Basin Formation \[\#2194\]
High-resolution crustal structure models of the Orientale Basin, CTH numerical simulations of the basin forming impacts, and flexural models are used to investigate the basin forming process and the origin of super-isostatic mantle uplifts.

Nahm A. L. Kring D. A.
Evidence of Normal Faulting of the Outer Rings of Orientale Basin: Preliminary Modeling Results \[\#1172\]
Forward mechanical modeling results indicate that the eastern Cordillera and Outer Rook rings of the lunar Orientale Basin formed by normal faulting.

New Estimates of the Thickness Decay of Proximal Ejecta from the Orientale Basin Using the Lunar Orbiter Laser Altimeter (LOLA) \[\#1395\]
The 930-km Orientale impact basin is the youngest basin of its size on the Moon, and its ejecta deposit modified a broad region. We present new observations of the thickness of the Orientale ejecta deposit on the basis of topographic data from LOLA.
Ambrose W. A.

*Distribution and Chronostratigraphy of Ejecta Complexes in the Humorum Basin Mapped from LROC and Lidar Data [#1035]*

LROC data reveal a population of small-scale ejecta features (asymmetric secondary craters, scours, and crater chains) in the Humorum Basin. These features are used to refine chronostratigraphic ages of landforms in the basin and basin margin.

Wilson L.   Head J. W.

*Impact Melt Sheets in Lunar Basins: Estimating Thickness from Cooling Behavior [#1345]*

We use morphologic constraints and theoretical modeling to estimate the thickness of the impact melt sheet in the Orientale basin.


*Ejecta Thickness of Lunar Impact Basin [#1301]*

In this study, we performed new crater size-frequency measurements for impact basins on the northern farside of the Moon to place constraints on the ejecta thickness models for impact basins using image data obtained by the SELENE Terrain Camera.


*Geologic Mapping of the King Crater Region with an Emphasis on Melt Pond Anatomy — Evidence for Subsurface Drainage on the Moon [#2437]*

King Crater’s melt pond exhibits a variety of details at the 0.5-m scale, including evidence for infiltration of melt. Crater-counting statistics show melt surfaces as less suitable for age dating than ejecta blankets. King Crater may be ~ 1 Ga old.

Zanetti M.   Hiesinger H.   van der Bogert C. H.   Reiss D.   Jolliff B. L.

*Aristarchus Crater: Mapping of Impact Melt and Absolute Age Determination [#2330]*

We report on progress made mapping Aristarchus Crater using high-resolution LROC NAC images. Observations include enigmatic impact melt features and stratified blocks of ejecta. An absolute model age using crater counts was also determined.

Öhman T.   Kring D. A.

*Photogeologic Analysis of Impact Melt-Rich Lithologies in the Lunar Crater Kepler Using LROC and Kaguya Data [#1177]*

LROC NAC and Kaguya images reveal several different modes of occurrence of impact melt-rich lithologies within and around lunar crater Kepler. Mapping shows asymmetric distribution of melt-rich smooth and hummocky floor units and exterior melt ponds.

Mazarico E.   Barnouin O. S.   Salamunićar G.   Zuber M. T.

*Impact Melt Volume Estimates of Small- to Medium-Sized Lunar Craters from Lunar Reconnaissance Orbiter Data [#2075]*

We use a recent lunar crater catalogue to facilitate the use of LROC and LOLA data to survey and estimate impact melt volumes in small- to medium-sized craters.

Hawke B. R.   Giguere T. A.   Lawrence S.   Bray V.   Denevi B. W.   Garry B.   Gaddis L.   Kestay L.   Robinson M.   LROC Science Team

*A Tale of Two Craters: Impact Melt at Two Very Small Craters on the Moon [#2347]*

We have used LROC NAC images to investigate the distribution, modes of occurrence, and volumes of the interior and exterior melt deposits associated with two very small (~3 km) and extremely young impact craters.
Correlation Between Surface Roughness and Slope on a Lunar Impact Melt [#1881]  
Tycho impact melts / Change from rough to smooth downhill / A’a to smooth pond?

Garvin J. B. Robinson M. S. Frawley J. Tran T. Mazarico E. Neumann G.  
Linne: Simple Lunar Mare Crater Geometry from LRO Observations [#2063]  
Geometric properties of the lunar mare crater Linne have been established by means of high-resolution topographic data from LRO’s LROC and LOLA instruments. Linne can be used as the basis for understanding simple craters on the planets.

Xiao Z. Strom R. G.  
Problem in Crater Counting by Small Craters — Peeking at the Geologic History of Crater Alphonsus [#2319]  
We prove that it is not plausible to date surface age by counting small craters.

Ostrach L. R. Robinson M. S. Denevi B. W. Thomas P. C.  
Effects of Incidence Angle on Crater Counting Observations [#1202]  
Using Apollo Metric and LROC NAC images, we determined that incidence angle affects reliable identification of (small) craters on a mare surface. This finding is consistent with Young [1975] and Wilcox et al. [2005] and requires additional study.

Fritz J.  
A 8.2 Ma Age for the Lunar Crater Giordano Bruno? [#1197]  
Giordano Bruno (22 km diameter) is the youngest lunar crater of its size. Its formation age is discussed by using literature data on (1) crater statistics, (2) ejection ages and petrography of lunar meteorites, and (3) ³He profiles of Earth’s sediments.

Moss N. G. Harper T. M. Motta M. B. Epps A.  
New Lunar Crater Search Using LROC-NAC vs LOIRP Lunar Orbiter Images [#1597]  
This paper describes an effort by students at the Lunar Orbiter Image Recovery (LOIRP) project to visually compare LOIRP images from Lunar Orbiter II with recent images from Lunar Reconnaissance Orbiter’s Narrow Angle Camera (NAC).

Zellner N. E. B. Gombosi D.  
How Significant are the Recent Lunar Impact Events? [#2109]  
We describe the nature of the reported increase in lunar impact flux over the last ~500 Ma.

Bell S. W. Thomson B. J. Dyar M. D. Bussey D. B. J.  
Dating Fresh Lunar Craters with Mini-RF [#1342]  
Using SAR imagery from Mini-RF on LRO, we have developed a method for dating small fresh lunar impact craters from the radar-bright halos around the craters. These halos represent the ejecta lingering on the lunar surface and degrading over time.

Bouley S. Baratoux D.  
Variation of Small Crater Degradation on the Moon [#1388]  
With the release of LRO data it is now possible to study the morphology of small craters and to observe the diversity of degradation features. This study has as its main goal the exploration of the evolution of crater degradation with time on the Moon.
Banks M. E.  Watters T. R.  Robinson M. S.  Bell J. F. III  Pritchard M. E.  Williams N. R.  
Daud K.  LROC Team
*The Search for Lunar Lobate Scarps Using Images from the Lunar Reconnaissance Orbiter Camera* [2736]
A search for previously undetected lobate scarps was conducted using images from the Lunar Reconnaissance Orbiter Camera. To date, previously undetected lobate scarps have been identified in LROC images and mosaics in 73 different locations.

Banks M. E.  Watters T. R.  Robinson M. R.  Tornabene L. L.  LROC Team
*Morphological Analysis of Lunar Lobate Scarps Using LROC NAC and LOLA Data: Preliminary Results* [2779]
LROC stereo-derived digital terrain models and LOLA data are used to measure the relief of 23 lunar lobate scarps. The relief of the lobate scarps ranges from ~4 to 130 m with a mean relief of ~25 m.

Watters T. R.  Robinson M. S.  Banks M. E.  Tran T.  LROC Team
*Evidence of Young Extensional Faulting on the Moon* [2022]
Previously undetected small-scale graben have been revealed in images obtained by the Lunar Reconnaissance Orbiter Camera. These small-scale graben are <1 billion years old and join the lobate scarps as the youngest tectonic landforms on the Moon.

---

**MOON: DATASETS, CATALOGS, AND ARCHIVES**

Scholten F.  Oberst J.  Matz K.-D.  Roatsch T.  Wählisch M.  Robinson M. S.  LROC Team
*GLD100 — The Global Lunar 100 Meter Raster DTM from LROC WAC Stereo Models* [2046]
We derived a lunar 100-m raster DTM (GLD100) for latitudes <80° from 50,000 LROC WAC stereo models. Until a PDS release in summer 2010, requests from the science community for subsets (or as a whole) will be satisfied on a best-effort basis.

Beyer R. A.  Archinal B.  Cheng Y.  Edmundson K.  Howington-Kraus E.  Kirk R.  Li R.  
McEwen A.  Mattson S.  Meng X.  Moratto Z.  Oberst J.  Rosiek M.  Scholten F.  Tran T.  
Thomas O.  Wang W.  LROC Team
*LROC DTM Comparison Effort* [2715]
This work involves several different groups using different techniques to build DTMs from the same starting data in order to assess various absolute and relative measures of the quality of LROC NAC derived terrain data.

Gaskell R.  Mastrodemos N.  Hayward R.  Rosiek M.
*SPC Topography from Clementine Images* [2535]
Topography of the lunar poles, constructed using stereophotoclinometry (SPC) and Clementine images, is compared with results from LOLA and LRO wide-angle camera analyses.

Salamunićcar G.  Lončarić S.  Mazarico E.
*From Interpolation Based Crater Detection Algorithm and LOLA Data Towards the Most Complete Global Catalog of Lunar Craters* [1449]
The global catalogue of 60,645 lunar craters was assembled, using new interpolation-based crater detection algorithm and LOLA data. As an accompanying result the global catalogue of 132,843 martian craters was assembled using a similar approach.

Fassett C. I.  Kadish S. J.  Head J. W.  Smith D. E.  Zuber M. T.  Neumann G. A.  Mazarico E.
*Lunar Impact Basins: Crater Statistics and Sequence from a Lunar Orbiter Laser Altimeter (LOLA) Catalog of Large Lunar Craters (≥20 km)* [1539]
We use a new global crater catalog mapped using Lunar Orbiter Laser Altimeter data to examine the stratigraphy of lunar impact basins. This catalog allows us to calculate crater statistics for many basins and determine their relative sequence.
Romine G. C.  Frey H. V.  
*Using LOLA Data to Test the Reality of Candidate Lunar Basins Derived from Older Data* [#1188]
LOLA data were used to assess the reality of 92 candidate large basins on the Moon derived from photogeologic and earlier topographic and crustal thickness data. Thirteen of 65 unnamed candidates were eliminated as possible large basins.

Oberst J.  Unbekannt H.  Scholten F.  Haase I.  Hiesinger H.  Robinson M.  
*A Search for Degraded Lunar Basins Using the LROC-WAC Digital Terrain Model (GLD100)* [#1992]
We have carried out a search for degraded impact basins on the Moon using as a basis the near-global digital terrain model (GLD100), derived from LROC-WAC stereo images.

Bauer A. W.  Stepinski T. F.  
*Machine Cataloging of Lunar Craters from Digital Terrain Model* [#1292]
Lunar craters are identified automatically from the LOLA-based digital elevation model using a computer algorithm.

*A Global Catalog of Large Lunar Craters (≥20 km) from the Lunar Orbiter Laser Altimeter* [#1006]
We have compiled a global catalog of large lunar craters using LOLA topography. The crater diameter and density data offer important insights regarding the age of the lunar surface and the history of the cratering flux in our solar system.

Buckingham D. T. W.  Salimkumar B.  Barlow N. G.  
*Development of a New GIS Database of Lunar Impact Craters* [#1428]
We are producing a new GIS-based catalog of all lunar impact craters 5-km-diameter and larger across the entire Moon. We present the current status of the crater database.

Talpe M. J.  Zuber M. T.  Clark M. E.  Mazarico E.  
*Regional Cataloguing of Lunar Crater Morphology* [#2549]
Altimetry profiles of lunar craters, obtained from the Lunar Orbiter Laser Altimeter (LOLA), are decomposed to extract key crater parameters.

Bussey D. B. J.  Spudis P. D.  Mini-RF Team  
*New Insights into Lunar Processes and History from Global Mapping by Mini-RF Radar* [#2086]
Mini-RF is a Synthetic Aperture Radar on NASA’s LRO. It uses a hybrid dual polarization architecture that permits the determination of all four Stokes parameters, which offer a powerful tool to investigate the nature of lunar radar backscatter.

Neumann G. A.  Mazarico E.  Smith D. E.  Zuber M. T.  Gläser P.  
*Lunar Orbiter Laser Altimeter Measures of Slope and Roughness* [#2313]
LOLA map products are presented that characterize surface topographic properties at scales of 3–100 m unattained by previous altimetry missions, useful for geological classification of impact features and for landed science.

*Selenodesy with LRO: Radio Tracking and Altimetric Crossovers to Improve Orbit Knowledge and Gravity Field Estimation* [#2215]
The orbit reconstruction of the LRO spacecraft is significantly improved by the use of LOLA altimetric crossovers. Total position accuracy are expected to be ~10–15 m over the whole first year of mission based on orbit overlaps.

**Next Steps in Radargrammetry of the Moon: Targeted Stereo Observations and Controlled Mosaic Production [#2392]**

Rigorous geometric analysis of Mini-RF radar images lets us make topographic models with 50 m horizontal and <10-m vertical resolution from specially targeted stereo observations, as well as subpixel-accurate mosaics of the lunar poles.

Mattson S. Bartels A. Boyd A. Calhoun P. Hsu O. McEwen A. Robinson M. Siskind J. Tran T.

**Continuing Analysis of Spacecraft Jitter in LROC-NAC [#2756]**

We present the results of an ongoing study of spacecraft jitter affecting the LROC-NAC, its effects on DTMs, and potential mitigation strategies. Included is a comparison of changes in jitter conditions since the end of commissioning phase.

Han S.-C. Mazarico E. Rowlands D. D. Lemoine F. G.

**New Analysis of Lunar Prospector Radio Tracking Data Improves the Nearside Gravity Field with a Higher Resolution to Degree and Order 200 [#2404]**

We present a new global gravity model that is useful to characterize the anomalies at a spatial scale of 27 km or smaller (i.e., degree and order 200). The new model captured the gravity anomalies over smaller craters that have not been reported.

Yamamoto A. Fujita T. Tateno N. Hareyama M.

**Data Visualization and Web Map Server (WMS) System for Kaguya (SELENE) [#1645]**

“Kaguya Image Gallery” and “Kaguya 3D GIS” are the web service that exhibit visualized data and scientific result of Japanese Lunar Orbiter “Kaguya (SELENE).” We will explain about Web Map Server (WMS) system and a client application for Kaguya.

Fortezzo C. M. Hare T. M.

**Digital Renovation of the Geologic Map of the Near Side of the Moon [#2293]**

We have digitally renovated the 1971 Wilhelms and MacCauley lunar near side geologic map. The digital version is in simple cylindrical with the geology and contact locations updated based on the Lunar Orbiter mosaic and a preliminary Kaguya DEM.


**Progress on High Resolution Mapping of the Lunar South Pole-Aitken Basin Interior [#2316]**

We are mapping the South Pole-Aitken basin interior Constellation site region of interest at high resolution using LROC and LOLA data. These data suggest it will be highly suitable as a landing site and provide a test case for future planning.

Lough T. A. Gregg T. K. P. Yingst R. A.

**Assessment of Geologic Mapping Techniques at Aristarchus Plateau, the Moon [#2013]**

We create and compare three geologic maps of Aristarchus plateau using three techniques: (1) relying heavily on compositional data; (2) using only morphologic data; and (3) synthesizing information from (1) and (2) to eliminate redundancies, but retain key geologic information.

---

**The Moon as an Airless Body**

Colaprete A. Shirley M. Heldmann J. Wooden D. H.

**The Final Minute: Results from the LCR0SS Solar Viewing NIR Spectrometer [#2037]**

This talk will present results from the LCR0SS solar viewing NIR spectrometer. This instrument provided solar occultation data as the instrument flew through the impact ejecta and vapor cloud.
*Ground Based Observations of Lunar Water: Current Status* [#2196]

We have begun a program of ground-based lunar observation in the 2–4 µm region, following up on the 
discovery of water in the lunar regolith. We will present the results from our first observing run, focusing 
on the Reiner Gamma region.

*Electrical Evolution of a Dust Plume from a Low Energy Lunar Impact: A Model Analog to LCROSS* [#1760]

We present a model of an impact plume grain charge evolution in a prevailing solar wind and photo-electron 
plasma environment.

Litvak M. L.  Mitrofanov I. G.  Sanin A. B.  Boynton W. V.  Chin G.  Garvin J. B.  Golovin D.  
Evans L. G.  Harshman K.  Kozyrev A. S.  Malakhov A.  McClanahan T.  Milikh G.  Mokrousov M.  
Sagdeev R.  Shevchenko V.  Shvetsov V.  Smith D. E.  Starr R.  Tretyakov V. I.  Trombka J.  Varenikov A.  
Vostrukhin A.  Zuber M. T.  
*LEND Studies of Diversity of PSRs on the Moon* [#1765]

Observation, analysis and discussion of Moon north and south polar shadow regions are presented based on data from 
LEND instrument aboard LRO mission.

Sanin A.  Mitrofanov I.  Boynton W.  Chin G.  Evans L.  Golovin D.  Harshman K.  Kozyrev A.  Litvak M.  
Malakhov A.  McClanahan T.  Milikh G.  Mokrousov M.  Sagdeev R. Z.  Shevchenko V.  Schvetsov V.  Starr R.  
Trombka J.  Vostrukhin A.  
*Global Mapping of Neutron Emission from the Moon According to LEND Data* [#1797]

We are presenting global and polar maps and analysis of thermal, epithermal and fast neutrons that have been 
measured by the LEND instrument, which is the large orbital neutron telescope for orbital mapping of the Moon’s 
electron albedo.

Garvin J. B.  Trombka J.  Sagdeev R. A.  Milikh G.  Nandikotkur G.  
*Insolation Effects on the Moon: High Topographic Slope Observations of the LRO LEND and LOLA Instruments* [#1970]

Recent results indicate some Hydrogen (H) concentrations lie outside permanent shadow regions. In this study we 
consider insolation effects using correlations of LRO LEND epithermal neutron maps and derivations from LOLA 
topography.

Hensley S.  Gurrola E.  Harcke L.  Marechal N.  Weintraub L.  Slade M.  Quirk K.  Wilson B.  Yun S.  
*Goldstone Solar System Radar High Resolution Imagery and Topography of the Lunar South Pole Region* [#1813]

Upgraded GSSR radar is used to generate 5 m resolution imagery of the moon’s south polar region and generate 15 m 
topographic maps. LCROSS impact point identified in the GSSR imagery.

Case A.  Looper M. D.  
*First Cosmic Ray Proton Albedo Map of the Moon* [#1852]

We have constructed a cosmic ray proton albedo map of the Moon using the previously reported strong presence of 
>60 MeV protons coming up from the lunar surface.

*Compositional Dependencies of Lunar High-Energy Epithermal Neutrons* [#2206]

The compositional dependence of high-energy (E > 1 keV) epithermal (HEE) neutrons is studied in relation to 
eutron measurements from the Lunar Reconnaissance Orbiter, and how these HEE neutrons may constitute a 
background in the observed orbital data.
Likhanskii A.  Poppe A.  Piquette M.  Messmer P.  Horanyi M.

*Plasma Sheath at Moon Craters: From Sunrise to Sunset [#2285]*
This poster presents the simulation results of plasma sheath formation above lunar craters in presence of solar wind collection, photoelectron emission, and external magnetic field.


*Lyman Alpha Mapping Project (LAMP) Far-Ultraviolet Maps of the Lunar Poles [#2496]*
LRO Lyman Alpha Mapping Project (LAMP) far-UV polar albedo maps are produced using an innovative nightside observing technique to investigate the intriguing volatile processes within permanently shaded regions (PSRs).


*Exploration Potential for Highly Illuminated Points at the Lunar Poles Using Kaguya, LOLA, and LROC Data Sets [#2518]*
This study updates Kaguya illumination modeling with LOLA topography. Model results are compared to the findings of previous studies, and LROC images are used to evaluate the exploration potential of locations of near-continuous illumination.

Speyerer E. J.  Robinson M. S.

*Analysis of Highly Illuminated Zones Near the Lunar South Pole [#2540]*
The Moon’s slightly tilted axis leaves some areas near the pole in permanent shadow, while other areas remain sunlight for the majority of the year. LROC data is used to analyze these illuminated zones that remain illuminated over 90% of the year.

Dove A.  Robertson S.  Wang X.  Poppe A.  Sternovsky Z.  Horányi M.

*Characterization of a Laboratory Simulated Lunar Photoelectron Sheath [#2650]*
We generate photoelectron sheaths by shining ultraviolet radiation on surfaces in vacuum. We measure the electron density and temperature, Debye length, and potential profiles above the surface to understand the sheath structure. Measurements are compared to model results.

Zimmerman M. I.  Farrell W. M.  Stubbs T. J.  Halekas J. S.

*The Plasma Wake Downstream of Lunar Topographic Obstacles: Preliminary Results from 2D Particle Simulations [#1836]*
We have performed fully 2D particle-in-cell simulations of plasma wakes in shadowed lunar craters. We will discuss preliminary results on wake formation and the effects of a dynamic lunar surface on the electrical environment within craters.

Spicuzza M. J.  Valley J. W.  Fournelle J.  Huberty J. M.  Treiman A.

*Native Silicon and Fe-Silicides from the Apollo 16 Lunar Regolith: Extreme Reduction, Metal-Silicate Immiscibility, and Shock Melting [#2231]*
Native silicon and Fe-silicides occur in a complex anorthositic grain from the Apollo 16 lunar regolith. We suggest formation of native silicon and Fe-silicides result from metal-silicate immiscibility, most likely the result of shock melting.

Miura Y.  Tanosaki T.  Udagawa M.

*Significance of Nano-Siderite Formation for Lunar Magnetic Change from Iron Metals [#1373]*
It is found that bulk compositional data cannot show direct relation to the lunar magmatic sources in detail, but iron- and carbon-bearing nanograinss have been obtained in lunar and iron meteorites, which can be applied to the Apollo samples.

**New Data Integration Towards Solving the Mystery of the Lunar Swirls [#1965]**

We are beginning a re-evaluation of the lunar swirls through the synthesis of new instrument data and the active collaboration of experts in the scientific fields from which these instruments derive.

Coman E. I. Blewett D. T. Hawke B. R. Gillis-Davis J. J.

**Lunar Swirls: How Dark Are “Dark Lanes”? [#1096]**

Image profiles across several prominent lunar swirls have been analyzed to determine the relation of dark lane reflectance to that of normal weathered regolith and ultimately the extent to which lunar crustal magnetization affects soil maturation.

Dukes C. A. Baragiola R. A.

**Sputtering of Na from the Lunar Surface: Laboratory Measurements [#2357]**

We have irradiated silicate minerals with and without deposited Na-coatings, using 4 keV He⁺, and measured a sputtering cross section for adsorbed-Na ($\sigma \approx 1 \times 10^{-15} \text{ cm}^2 \text{ atom}^{-1}$). A large fraction of the Na is sputtered as ions rather than as neutrals.

---

**THE DUST BIN: LUNAR SOIL AND REGOLITH PROCESSES**

Cook A. C.

**Tidal Influences at the Lunar Crater Aristarchus and Transient Lunar Phenomena [#2811]**

This abstract investigates whether there is an obvious correlation between transient lunar phenomena and Earth tides on the Moon, as has been claimed in past publications. Aristarchus Crater observations are used in this study.

Crotts A. P. S.

**Search for Short-Term Changes in the Lunar Surface: Permanent Alterations Over Four Decades [#2600]**

We compare similar, high-resolution images from Lunar Orbiter III and V and Lunar Reconnaissance Orbiter Camera’s narrow angle channel, separated by more than four decades, and sensitive to changes caused by impacts, mass wasting, and outgassing through the regolith.

Binnie S. A. Nishiizumi K. Welten K. C. Caffée M. W.

**Lunar Regolith Dynamics Inferred from Cosmogenic Radionuclides $^{10}$Be and $^{36}$Cl in Core 68002/68001 [#2713]**

Measurements of cosmogenic $^{10}$Be and $^{36}$Cl from lunar core 68002/68001 are compared to steady-state production profiles. Results suggest regolith mixing at this site may occur over timescales shorter than previously documented.

Yakovlev O. I. Gerasimov M. V. Dikov Yu. P.

**Genesis of Lunar Segregated and Grain Rims Condensates [#1664]**

All compositions of condensed lunar findings are correlated with compositional evolution of the vapor over basaltic melt within the whole range of its variation.

Sakatani N. Ogawa K. Iijima Y. Honda R. Tanaka S.

**Experimental Study of Thermal Conductivity for Regolith Using Glass Beads as Analogous Material [#1686]**

In this study, parameter dependencies of the thermal conductivity of powder materials were investigated using glass beads. Our experiments revealed that there are effects that increase the thermal conductivity with depth on the Moon.

Cooper B. L. McKay D. S. Wallace W. T. Gonzalez C. P.

**Fluids and Their Effect on Measurements of Lunar Soil Particle Size Distribution [#2210]**

Laser diffraction instruments allow rapid assessment of particle size distribution, and eventually may replace sieve measurements. However, care must be taken in choosing a carrier fluid that is compatible with lunar material.
Barmatz M.  Steinfeld D.  Begley S. B.  Winterhalter D.  Allen C.
*Microwave Permittivity and Permeability Measurements on Lunar Soils [#1041]*
There has been speculation that the excellent microwave absorption of lunar soil came from the nanophase iron content. This room temperature study suggests that nanophase iron does not play a major heating role.

Crites S. T.  Lucey P. G.
*Characterization of Lunar Soils Using a Thermal Infrared Microscopic Spectral Imaging System [#1340]*
We present a study of effects of space weathering on thermal infrared properties of lunar soils using a thermal infrared hyperspectral imaging system developed for remote sensing and altered to enable resolved microscopic spectral imaging.

Bandfield J. L.  Hayne P. O.  Ghent R. R.  Greenhagen B. T.  Paige D. A.
*Lunar Surface Roughness and Anisothermality Effects on Infrared Measurements [#2468]*
Surface roughness has been derived from LRO Diviner Radiometer nadir and multiple emission angle observations. Both near- and thermal-infrared spectra are significantly affected, resulting in spectral features correlated with latitude and local time.

Bauch K. E.  Hiesinger H.  Robinson M. S.  Scholten F.
*Thermophysical Properties of Selected Lunar Study Regions Determined from LROC and Diviner Data [#2278]*
Using Diviner temperature data combined with subsets of the 100 m grid LROC WAC DTM (GLD100), we derived maps of thermal inertia for different study regions, such as Taurus-Littrow Valley, Aristarchus and Lichtenberg Crater.

Campbell B. A.  Hawke B. R.  Carter L. M.
*Blocky Regolith and Rugged Subsurface Deposits on the Moon: Correlation of Dual-Wavelength Radar Data and High-Resolution Images [#1417]*
Earth-based radar observations at 12.6-cm and 70-cm wavelengths show that some lunar domes and mare complexes have rugged morphology. We compare radar images with LROC photos to better understand the geology of these surprising deposits.

Nickerson R. D.  Bart G. D.  Lawder M. T.  Melosh H. J.
*Global Lunar Regolith Depths Revealed [#2607]*
We examine global lunar regolith depth averages in order to obtain a global understanding of the development of the lunar regolith.

Bart G. D.  Nickerson R. D.  Lawder M. T.
*Geologic Unit Differences are Reflected by Lunar Regolith Depths [#2597]*
We examine the relationship between individual lunar regolith depth measurements, lunar subsurface structure, and specific lunar geologic units in order to better understand how the lunar surface has evolved at particular locations.

Fa W.  Wieczorek M. A.
*A Preliminary Inversion of Lunar Regolith Thickness Using Earth-Based 70-cm Arecibo Radar Observations [#1506]*
In this study, a rigorous radar scattering model based on vector radiative transfer theory and Earth-based 70-cm Arecibo radar data are used to invert for regolith thickness over the lunar nearside hemisphere.

Morgan G. A.  Campbell B. A.  Thompson T. W.  Hawke B. R.
*70-cm Radar Studies of Blocky Crater Ejecta as a Guide to Megaregolith Thickness Across the Nearside of the Moon [#2497]*
We surveyed radar bright craters on the nearside of the moon from 70-cm Arecibo data. The spatial distribution of these craters provides a proxy for megaregolith thickness that in turn can be used to map the presence of ancient basin ejecta material.
Patterson G. W.  Cahill J. T. S.  Bussey D. B. J.  Lawrence S. J.  Turtle E. P.  Robinson M. S.  
*Characterizing the Surface Roughness of Ejecta Fields Associated with Km-Scale Fresh Lunar Craters [#2188]*

Using the Mini-RF and LROC NAC instruments aboard LRO, we have begun to characterize the distribution of cm- to m-scale boulders associated with the ejecta of km-scale fresh lunar craters.

McAdam M. M.  Cahill J. T. S.  Patterson W.  Aldridge T.  Bussey D. B. J.  Turtle E. P.  Thomson B. J.  
Neish C. D.  Mini-RF Team  
*Mini-RF Global Radar Observations of the Moon [#2197]*

A presentation and analysis of the global Mini-RF radar products.

---

**MOON: REMOTE SENSING NUTS AND BOLTS**

Speyerer E. J.  Robinson M. S.  Denevi B. W.  LROC Science Team  
*Lunar Reconnaissance Orbiter Camera Global Morphological Map of the Moon [#2387]*

This spring, the LROC science team will be releasing a monochrome (643 nm) global morphological basemap through the LROC website (http://lroc.sese.asu.edu) and the PDS. The basemap will reflect the latest calibration and the 100 m/pixel WAC DTM.

Nagasubramanian V.  Radhadevi P. V.  Krishna Sumanth T.  Sudheer Reddy D.  Saibaba J.  Varadan G.  
*3D Visualization of the Lunar Surface from Images of Terrain Mapping Camera [#1389]*

This paper explains a simple method of relative orientation of images from the Terrain Mapping Camera and generating relative digital elevation models and three-dimensional views of the lunar surface.

Vickers M. J.  Cook A. C.  
*Textural Analysis of the Lunar Surface Using a Shaded Digital Elevation Model [#2465]*

This paper presents the application of an automated texture classification technique to a lunar digital elevation model (DEM) with the aim of assisting researchers in searching through this vast amount of data for morphological features of interest.

Li R.  Wang W.  He S.  Yan L.  Meng X.  Crawford J.  Robinson M. S.  Tran T.  Archinal B. A.  LROC Team  
*Latest Results of 3D Topographic Mapping Using Lunar Reconnaissance Orbiter Narrow-Angle Camera Data [#2010]*

This abstract presents the latest research results and quantitative analysis of topographic mapping using Lunar Reconnaissance Orbiter Camera (LROC) Narrow Angle Cameras (NAC) conducted at the Ohio State University.

Boyd A.  Tran T.  Robinson M. S.  Scholten F.  Oberst J.  LROC Team  
*Categorization of Lunar Terrain Using High Resolution WAC DTM Data [#2684]*

The Lunar Reconnaissance Orbiter Camera WAC GLD 100 DTM was used to characterize terrain by slope, roughness, and elevation. Mare and highland plains were automatically identified by slope and roughness parameters.

Scholten F.  Oberst J.  Matz K.-D.  Roatsch T.  Wählisch M.  Gläser P.  Robinson M. S.  Mazarico E.  
Neumann G. A.  Zuber M. T.  Smith D. E.  
*Complementary LRO Global Lunar Topography Datasets —A Comparison of 100 Meter Raster DTMs from LROC WAC Stereo (GLD100) and LOLA Altimetry Data [#2080]*

We compared two topographic datasets of the LRO mission: the LROC WAC 100 m raster DTM (GLD100) and LOLA altimetry data.
Grumpe A. Wöhler C.

**A Photometric Approach to the Construction of Lunar Digital Elevation Maps Using Chandrayaan-1 M3 Imagery in Combination with Laser Altimetry Data** [#1478]

In this abstract we present a photometric DEM construction method that makes use of existing laser altimetry data to obtain large-scale convergence. We demonstrate the simultaneous generation of detailed elevation maps and nonuniform albedo maps.

Lončarić S. Salamunićcar G. Grumpe A. Wöhler C.

**Automatic Detection of Lunar Craters Based on Topography Reconstruction from Chandrayaan-1 M3 Imagery** [#1454]

We make use of the Chandrayaan-1 Moon Mineralogy Mapper dataset and laser altimetry data to construct a DEM of high lateral resolution, and show that it can be used with our DEM-based crater detection algorithm.


**Full-Mission Selenolocation Progress for the Moon Mineralogy Mapper on Chandrayaan-1** [#2012]

M3, a NASA imaging spectrometer, acquired near-global coverage of the Moon on ISRO’s Chandrayaan-1. We discuss challenges to the selenolocation of the data, describe our current models and results, and provide suggestions for improved processing.

Green R. O. Pieters C. M. Boardman J. Lundeen S. Staid M. M3 Team

**The Moon Mineralogy Mapper Data Set Delivered to the Planetary Data System and Calibration and Validation Status** [#2089]

The Moon Mineralogy Mapper data set delivered to the Planetary Data System and calibration and validation status.

Matsunaga T. Yokota Y. Yamamoto S. Nakamura R. Ohtake M. Haruyama J.

**Lunar Global Spectral Reflectance Data Set by Kaguya Spectral Profiler** [#2200]

By applying the photometric correction, Lunar Global Spectral Reflectance data set were generated from Kaguya Spectral Profiler data. Principal component (PC) analysis to this global data set gave PCs which show various spectral features in both global and regional scales.

Paige D. A. Williams J. P. Sullivan M. T. Greenhagen B. T.

**LRO Diviner Lunar Radiometer Global Mapping Results and Gridded Data Product** [#2544]

The LRO Diviner Lunar Radiometer global gridded dataset reveals the extreme nature of the lunar thermal environment and its diurnal and seasonal variability.

Greenhagen B. T. Lucey P. G. Bandfield J. L. Hayne P. O. Williams J. P. Paige D. A.

**The Diviner Lunar Radiometer Compositional Data Products: Description and Examples** [#2679]

Diviner’s first derived compositional data products will be released into the Planetary Data System by mid-March, 2011. This presentation describes the creation and provides examples of Diviner’s compositional data products.

Williams J.-P. Paige D. A. Vasavada A. R.

**Interpreting LRO Diviner Surface Temperatures: Modeling Lunar Regolith Thermophysical Properties and Topography in Three-Dimensions** [#2808]

We are developing a three-dimensional finite-difference model of the lunar regolith including topography and ray tracing to understand how small-scale slopes, shadows, and rocks within a Diviner surface footprint influence temperatures derived from Diviner observations.
Smith D. E.  Zuber M. T.  Neumann G. A.  Mazarico E.  Head J. III  Torrence M. H.  LOLA Science Team

Results from the Lunar Orbiter Laser Altimeter (LOLA): Global, High Resolution Topographic Mapping of the Moon [#2350]

The laser altimeter on LRO has been collecting altimeter, surface slope, surface roughness, and reflectance measurements since starting operation in early July 2009; models of the lunar topography and surface structure have been developed from these measurements.


Evaluation of Thermal Components in the Kaguya SP/NIR2 Spectral Data [#2256]

This study focuses on determining thermal components of the NIR2 spectral data for its calibration. We evaluated thermal flux from the instrument interior using the observing data of the onboard calibration module.


Background Peaks in the Kaguya Gamma-Ray Spectra [#2405]

Background peaks in Kaguya gamma-ray spectra were studied, including a spectrum obtained while looking away from the Moon. Some peaks for U, Th, and Ca are not good for determining elemental abundances.

Hareyama M.  Karouji Y.  Kobayashi S.  Yamashita N.  Gasnault O.  Reedy R. C.  Hasebe N.

An Estimation Method of the Lunar Fast Neutron Distribution Derived from a Gamma Ray Spectrometer Using a Ge Crystal [#1687]

This report proposes a new method to estimate relative distribution of lunar fast neutron flux based on the data observed by Kaguya GRS.

Blanchette-Guertin J.-F.  Johnson C. L.  Lawrence J. F.

Characterization of Scattering in Lunar Seismic Coda [#1374]

We characterize long-duration APSE lunar seismic codas via their rise times and their characteristic decay times. We compared them to synthetically generated signals in order to indentify suites of interior structure models compatible with the data.

---

**MOON: MISSIONS AND SAMPLES**

Su X. L.  Huang Q.  Ping J.  Yan J.

The Improved Topographic Model from Chang’E-1 Mission [#1077]

Using the precise orbit data based on new developed lunar gravity field model, and considering the drifts of time tag existing in the laser altimeter measurements of Chang’e-1 lunar mission, a new topographic model CLTM-s03 has been developed.


The First Microwave Image of the Complete Moon from Chang’E-1 Lunar Orbiter [#1352]

The first microwave image of the complete Moon from China’s CE-1 MRM is presented. These new results are incomparable to any groundbased observation in spatial resolution and temperature sensitivity, and could be unsurpassed in the near future.

Ping J.  Su X.  Huang Q.  Yan J.

New Selenodetic Results In Chang’E-1 Mission [#1036]

Chang’E-1 topography and gravity recovery lunar mascon basins.


The Lunar Reconnaissance Orbiter: Plans for the Science Phase [#2065]

Plans for the Lunar Reconnaissance Orbiter extended mission are discussed, including mission objectives, orbit options, and operational strategies.
Mest S. C.  Bleacher J. E.  Petro N. E.  Yingst R. A.
Scientific Characterization of Lunar Regions of Interest [#2508]
This abstract describes newly funded work to characterize lunar regions of interest using several datasets (e.g., LRO, Chandrayaan-1, Kaguya, Clementine, and Apollo), and evaluate their scientific “value” through hypothetical traverse development.

Thom N. E.
Revision of Mass and Power Estimates for the Reduction of Lunar Ilmenite [#1528]
Previous large-scale studies on the reduction of lunar ilmenite with hydrogen have been compared, and their estimated mass and energy needs updated.

MARS INSTRUMENTS: METHODS AND CALIBRATIONS FOR THE MARS SCIENCE LABORATORY AND THE MARS RECONNAISSANCE ORBITER

Viviano C. E.  Moersch J. E.
Using THEMIS to Address Discrepancies Between OMEGA/CRISM and TES Detections of Phyllosilicates [#2251]
We test the effects of THEMIS and TES spatial resolution using realistic temperatures and spatial distributions of clay to address discrepancies between OMEGA/CRISM and TES observations, and to estimate the increased sensitivity THEMIS may have.

King P. L.  Izawa M. R. M.  Vernazza P.  McCutcheon W. A.  Berger J. A.  Dunn T.
Salt — A Critical Material to Consider when Exploring the Solar System [#1985]
Salts significantly affect the physical and chemical properties of planetary bodies. We examine reflectance infrared spectra of silicate mixtures with IR-transmissive salts and show that adding salt produces spectra with transmission features.

Arnold J. A.  Glotch T. D.
Mid-IR Optical Constants of Anisotropic Minerals [#1923]
A method for deriving optical constants of minerals belonging to the monoclinic system is outlined.

Trang D.  Lucey P. G.  Gillis-Davis J. J.
The Optical Constants of Olivine in the Near-Infrared as a Function of Iron Content [#2745]
Optical constants are important to first-principles modeling of the spectral properties of planetary surfaces. We derived the optical constants of olivine as a function of Fo content into 22 parameters by using the modified Gaussian model.

Ehlmann B. L.  Mustard J. F.  Poulet F.  Hiroi T.
Nonlinear radiative transfer modeling enables remote quantification of surface composition using visible/near-infrared reflectance spectra. We test Hapke and Shkuratov model accuracy for phyllosilicate-bearing mixtures relevant to Mars and asteroids.

Stack K. M.  Milliken R. E.
Reflectance Spectroscopy of Clay-Sulfate Mixtures: Implications for Quantifying Hydrated Minerals and Determining Depositional Environments on Mars [#2024]
We examine the spectral properties of a suite of binary mixtures containing hydrated magnesium sulfate mixed with varying proportions of Fe, Mg, or Al-smectite. Our results will aid in interpreting CRISM and OMEGA spectra of hydrated mineral deposits.
Pitman K. M.  Noe Dobrea E. Z.  Dalton J. B. III  Jamieson C. S.  Abbey W. J.
*Reflectance Spectra and Optical Constants of Mars Alteration Products: Hydrated Magnesium Sulfates* [#1458]
Reflectance spectra and optical constants are necessary to compare to spacecraft data and infer abundances of mixed minerals. We will present such VNIR data at T = 200 and 300 K for aqueous alteration products observed on Mars: hydrated Mg-sulfates.

*Visible and Near-IR Reflectance Spectra of Mars Analogue Materials Under Arid Conditions for Interpretation of Martian Surface Mineralogy* [#2757]
Spectra for Mars analogue materials that result from thermal treatments at 25°C, 110°C, and 210°C in arid atmospheres for laboratory timescales provide reasonable surrogate spectra for simulating geologic timescales on Mars.

Daly T.  Gavin P.  Chevrier V.
*Effects of Thermal Alteration on the Near-Infrared and Mid-Infrared Spectra of Martian Phyllosilicates* [#1164]
We characterized how the NIR and MIR spectra of saponite, kaolinite, chlorite, serpentine, and prehnite change with thermal alteration. Based on these data, we determined that saponite found in a Mawrth Vallis crater is older than the impact crater.

Che C.  Glotch T. D.
*Spectroscopic Study of Dehydrated and/or Dehydroxylated Phyllosilicates and Natural Zeolites: Implications for Martian Exploration* [#1393]
We present the attenuated total reflectance (ATR), mid- to far-infrared specular reflectance, mid- to far-infrared emissivity, and near-infrared diffuse reflectance spectra of incrementally heated clay and zeolite samples for future search for dehydrated or dehydroxylated clays on Mars.

Schmidt F.  Ceamanos X.  Douté S.  Luo B.  Jouannic G.  Chanussot J.
*Spectral Unmixing for Planetary Exploration Applied to CRISM/MRO Hyperspectral Imagery* [#1772]
We perform blind spectral unmixing on CRISM hyperspectral image of the Russel dune on Mars. A comparison between the VCA and BPSS unsupervised algorithms and geomorphological classification is done to validate the methods.

*CRISM Data Processing and Analysis Products Update — Calibration, Correction, and Visualization* [#1438]
The CRISM team has updated the radiometric calibration, implemented a custom hyperspectral filtering procedure, and augmented the browse product pipeline. The result is a set of high-level CRISM data products with enhanced scientific utility.

Parente M.  Mustard J. F.  Murchie S.  Seelos F. P.
*Summarizing the Spectral Variability of CRISM Images with Endmember Extraction* [#2622]
This paper introduces an algorithm that extracts image endmembers of a hyperspectral scene, which can be used as the scene concise mineralogical representation. The algorithm is validated by comparison with manual detections performed by an expert.

Pommerol A.  Beck P.  Schmitt B.  Montes-Hernandez G.  Quirico E.
*Deciphering the Hydration State of the Martian Surface from Near-Infrared Spectroscopy* [#1890]
We characterize the hydration state of Mars’ surface through comparison between laboratory simulations and remote-sensing data. The relative strength of the 1.9- and 3-μm features indicates the presence of an hydroxylated phase in the surface dust.

*Improved Algorithm for CRISM Volcano Scan Atmospheric Correction* [#2453]
A new technique for empirical removal of atmospheric absorption features in martian hyperspectral imagery acquired by CRISM on MRO reduces an artifact at 2.0 μm to avoid interference with surface mineralogical features.

Understanding HiRISE Color Imaging of Mars — A Potential New Tool for Assisting in Mineral Identification at the Meter Resolution [#2402]

HiRISE camera has enabled the production of color ratio images that indicate mineral variability at HiRISE-scale resolution. Color ratio images will be compared with CRISM observations. An overview of the new HiRISE color ratio products will be given.

Thomson B. J.  Bridges N. T.  Cohen J.  Hurowitz J.  Lennon A.

Estimating Rock Strength Parameters from Rock Abrasion Tool (RAT) Grinds [#2567]

We have developed an empirical correlation between rock abrasion tool (RAT) grind energy and compressive strength. This correlation can be used to infer the physical properties of rocks ground by the MER rovers on Mars.


Poorly Crystalline Iron-Bearing Aluminosilicates and Their Importance on Mars [#1939]

We have synthesized Fe-substituted nanoaluminosilicates and characterized their structures using X-ray absorption spectroscopy. Measurement of these materials’ reflectance spectra will enable detection of similar phases on Mars.

Jawin E. R.  Dyar M. D.  Lane M. D.  Bishop J. L.  Marchand G. J.

Inter-Relationships Among Mössbauer Parameters of Phosphate Minerals and Crystal Structures [#1259]

Mössbauer spectroscopy parameters for phosphate minerals are related to phosphate structure groups and the local environment around the Fe cations.


Measuring Neutrons and Gamma Rays on Mars — The Mars Science Laboratory Radiation Assessment Detector MSL/RAD [#1793]

We investigate methods for deriving separate statistical estimates for the neutron and gamma radiation on Mars from measurements to be performed by MSL/RAD.


Studies of Layering Structure of Martian Subsurface by Active Neutron Experiment DAN Onboard MSL [#1776]

Results of DAN/MSL field tests and calibrations are presented.

Anderson R. B.  Morris R. V.  Clegg S. M.  Bell J. F. III  Humphries S. D.  Wiens R. C.

A Comparison of Multivariate and Pre-Processing Methods for Quantitative Laser-Induced Breakdown Spectroscopy of Geological Samples [#1308]

We report on efforts to improve the accuracy of quantitative LIBS for geologic samples by comparing multivariate methods and by using feature selection, spectral averaging, and training set selection.


Error Analysis for Remote Laser-Induced Breakdown Spectroscopy Analysis Using Combinations of Igneous, Sedimentary and Phyllosilicate Samples [#1258]

LIBS will be used by the ChemCam instrument on MSL to obtain chemical analyses. This study examines accuracies that result from using combinations of different rock types and minerals in the training set used for calibration by multivariate analysis.
Speicher E. A.  Dyar M. D.  Carmosino M. L.  Clegg S. M.  Wiens R. C.
Single Variable and Multivariate Analyses of Remote Laser-Induced Breakdown Spectra for Prediction of Rb, Sr, Cr, Ba, and V in Igneous Rocks [#2385]
Single variable (SLR) and multivariate (PLS-2 regression) techniques were employed for analyses of remote laser-induced breakdown spectra for determination of Rb, Sr, Cr, Ba, and V in igneous rock samples.

Cousin A.  Forni O.  Maurice S.  Lasue J.  Gasnault O.  Wiens R.
Independent Component Analysis Classification for ChemCam Remote Sensing Data [#1973]
ChemCam is an instrument using the LIBS technique to analyze rocks on the martian surface. ChemCam shows the elemental compositions of rocks at several distances (1–7 m), and ICA tool allows classification of these rocks.

Achilles C. N.  Ming D. W.  Morris R. V.  Blake D. F.
Detection Limit of Smectite by CheMin IV Laboratory Instrument: Preliminary Implications for CheMin on the Mars Science Laboratory Mission [#2671]
Mineral mixtures of smectite and olivine were combined in varying proportions and measured with the CheMin IV laboratory instrument to estimate a preliminary detection limit of smectite in a simple two mineral system.

Wiens R. C.  Maurice S.  Bender S.  Barraclough B. L.  Cousin A.  Forni O.  Ollila A.  Newsom H.  Vaniman D.  Clegg S.  Lasue J. A.  Blaney D.  DeFlores L.  Morris R. V.  ChemCam Team
Calibration of the MSL/ChemCam/LIBS Remote Sensing Composition Instrument [#2370]
We describe the MSL/ChemCam/LIBS calibration and characterization procedures and results, and present plans for final analyses during rover system thermal testing.

INSTRUMENT AND PAYLOAD CONCEPTS

Kabai S.  Bérczi Sz.
A Study of Possible Geometries of Modules for Shape Changing and Self Reconfigurable Robots with the Use of Interactive Wolfram Mathematica Demonstrations [#2345]
The self-reconfiguration of modules in robots could be used to change the overall functionality of the robots serving specific purposes. This abstract shows a few examples from the many different solutions we studied.

Hudson T. L.  Diaz E.  Doan D.  Gordon S.  Kobie B.  Kokorowski M.  Neidholdt E.  Banfield D.
A Balloon-Borne Mars Analog Platform for ‘Field’ Tests of In Situ Instruments [#1980]
The stratosphere is a natural Mars surface analog with low pressure, low temperature, wind, and a radiation-dominated thermal environment. The ASTRA mission, which operates three prototype in situ Mars instruments on a stratospheric balloon platform, is described.

Reach W. T.
Stratospheric Observatory for Infrared Astronomy Capabilities for Planetary Science [#2625]
The Stratospheric Observatory for Infrared Astronomy (SOFIA) has initiated its scientific operations. The capabilities for planetary science are presented in this poster. The first full-year open call for proposals will be issued in the fall of 2011.

Chu W. K.  Clark P.  Cox R. T.  Scharfstein G.  Winglee R.
JWST: Pathfinder for Long-Duration Solar System Missions [#1735]
The James Webb Space Telescope (JWST) will not only explore the secrets of the distant universe but it may provide the key to the exploration of our solar system for both manned and unmanned long-duration missions.

Fillingim M. O.  Delory G. T.  Halekas J. S.  Grimm R. E.
Signal Strength and Bandwidth for Magnetotelluric Sounding of the Moon [#2475]
We consolidate previous observations to develop a catalog of electromagnetic disturbances at the Moon that will be useful for surface magnetotelluric measurements.
*Measurement of the Thermal Lithospheric Thickness of Venus Using Aerial Electromagnetic Sounding [#1551]*  
Understand Venus geodynamics from 180,000 ft.

Carroll K. A.  
*Gravity Gradiometry for Lunar Surface Exploration [#1108]*  
The use of gravity gradiometer instruments on the lunar surface is examined, for the purpose of mapping density variations in the near-subsurface, which for example could be due to buried rocks or to topographical variations in stratigraphy.

Currie D. G.  Dell’Agnello S.  Delle Monache G.  
*Lunar Laser Ranging: Flight Hardware Simulation, Testing and Status [#2448]*  
The current accuracy of lunar ranging is limited by the Apollo arrays. We describe the next generation of retroreflectors that will increase the ranging accuracy, and thus the selenophysics and general relativity science by two orders of magnitude.

Iwata T.  Matsumoto K.  Ishihara Y.  Kikuchi F.  Harada Y.  Sasaki S.  
*A Study on the Four-Way Doppler Measurements and Inverse VLBI Observations for Mars Rotation Observations [#1132]*  
We plan to observe the multi-landers on the Mars using the four-way Doppler measurements relayed by an orbiter to observe mars rotation as a mission candidate of MELOS (Mars Exploration with Lander-Orbiter Synergy). We also introduce the new technology called inverse VLBI.

Kakuma H. K.  Ishihara Y. I.  
*Consideration of Broadband Seismic Observation on Mars [#1865]*  
Japan Mars Exploration Project (MELOS) is now under discussion and it includes seismic measurements. We will issue a report on the Mars seismometer and environmental problems.

ElShafie A.  Chevrier V. F.  
*Mechanical Properties of Planetary Analog Material as Inferred from Penetration Testing [#2741]*  
Mechanical properties of planetary analog materials can be inferred from penetration testing which will allow us to estimate the penetration force under martian gravity.

Zacny K.  Chu P.  Wilson J.  Davis K.  Craft J.  
*Core Acquisition and Caching for the 2018 Mars Sample Return Mission [#1878]*  
In this poster we present an approach to core acquisition and caching for the 2018 Mars Sample Return, MAX-C rover mission.

Paulsen G.  Zacny K.  McKay C.  Glass B.  Szczesiak M.  Craft J.  Santoro C.  Shasho J.  Davila A.  
Marinova M.  Pollard W.  Jackson A.  
*Field Testing of the IceBreaker Mars Drill in the Antarctic [#1901]*  
We report on testing of a Mars prototype drill, called the IceBreaker, in University Valley (the Beacon Valley region of Dry Valleys). The drill penetrated 1 meter in ice-cemented ground in ~1 hr, with 100wWatt power and <100 N wt on bit.

Seweryn K.  Banaszkiewicz M.  Bednarz S.  Gonet A.  Grygorczuk J.  Rybus T.  Ryczniak M.  Wawrzaszek R.  Wisniewski L.  Wojcikowski M.  
*Mole Penetrator ‘KRET’ for Lunar Exploration [#1437]*  
The paper highlights the major achievements in a mole penetrator KRET developments, such as single stroke dynamics, lunar regolith analogue development, results of test in 5-m test-bed system, and development of a mole penetrator capable of working in zero-gravity conditions.
Numerical Modeling of Fiber Optic Bundles for In Situ Reflectance Spectroscopy [1962]
Fiber optics will help keep subsurface exploration instruments small and lightweight. Here we experimentally and numerically investigate the characteristics of several fiber optic probes.

Imaging Detectors in Planetary and Space Science [1543]
We have begun work on a program involving the use of CMOS imaging technology in the application of lunar and planetary science. The paper outlines the project and the detector, presents “first light” images, and details the next steps in the program.

The High-resolution Stereo Color Imager (HiSCI), chosen for the payload of the ExoMars Trace Gas Orbiter (TGO), is described.

This abstract describes the Mars Science Laboratory (MSL) Rover Navigation Cameras (Navcams). The MSL rover is scheduled for launch in November/December 2011.

Automated Sample Processing for Future Martian Astrobiology Missions [1589]
We describe a sample processing mission that was developed for astrobiological missions on Mars and Europa. The ASPS consists of a solvent extraction system and a distribution subsystem that directs the liquid analyte to multiple different analytical instruments.

A Microfluidics-HPLC/Differential Mobility Spectrometer Macromolecular Detection System for Human and Robotic Missions [1423]
Our goal is to develop a unique, miniaturized, solute analyzer based on microfluidics technology. The analyzer consists of an integrated microfluidics High Performance Liquid Chromatographic chip/Differential Mobility Spectrometer (HPLC-chip/DMS) detection system.

The effectiveness of thermochemolysis was studied as a sample preparation method for GCMS analyses of martian samples. As a result of this research, thermochemolysis experiments have been included in the SAM instrument suite on the 2011 MSL mission.

Measuring Sulfur Isotope Ratios from Solid Samples with the Sample Analysis at Mars Instrument and the Effects of Dead Time Corrections [2800]
We discuss the development of a method for determining sulfur isotope ratios with the SAM quadruple mass spectrometer by pyrolysis of solid sulfate samples.
Conrad P. G. Eigenbrode J. E. Mogensen C. T. Von der Heydt M. O. Glavin D. P. Mahaffy P. M. Johnson J. A.
The Mars Science Laboratory Organic Check Material [#2076]
This is a report on the development of the organic check material (OCM), which is part of the payload of the Mars Science Laboratory.

Goetz W. Steininger H. Steinmetz E. Bierwirth M. Goessmann F. Philippon C. Lustreinent B. Szopa C. Buch A. Amundsen H. Fogel M. Steele A.
Mars Organic Molecule Analyzer (MOMA) Field Test as Part of the AMASE 2010 Svalbard Expedition [#2460]
A breadboard of the MOMA instrument (Mars Organic Molecule Analyzer, part of the ExoMars science payload) has been tested during the AMASE 2010 Svalbard expedition. This paper presents in-field acquired data on organic-rich shales.

Sobron P. Wang A.
Spectral Data Processing for LIBS Quantitative Elemental Analysis of Geological Samples [#1640]
We have developed a set of routines for fast geochemical evaluation of LIBS targets under Earth and Mars atmospheric conditions. The atomic fractions of K, Na, Mg, Ca, Al, Fe, S, H in sulfate samples are calculated by using calibration functions.

Lienert B. R. Sharma S. K. Bates D. E.
Reduction of Spectral Correlation in LIBS Data Using Lorentzian Fitting [#2831]
Laser Induces Breakdown Spectroscopy (LIBS) is one of the methods deployed on the Mars Science Lander for determining chemical composition.

Prediction Accuracy of Laser-Induced Breakdown Spectroscopy: Quantitative Analysis of Olivine [#1743]
We investigated the possibility of predicting the elemental abundance of olivine, which is one of the important minerals, by laser-induced breakdown spectroscopy in several sample conditions and laser-irradiation conditions.

Carmosino M. L. Bender S. Speicher E. A. Dyar M. D. Clegg S. M. Wiens R. C.
End-to-End Models for Effects of System Noise on LIBS Analyses of Igneous Rocks [#1739]
We use a data set of 100 igneous rocks to assess LIBS instrument performance by degrading spectra, either by increasing peak widths (simulating misalignment) or decreasing the spectral amplitude (decreases in SNR).

Moreschini P. Zacny K. Paulsen G.
Laser Induced Breakdown Spectroscopy for Downhole Analysis of Lunar Regolith [#1318]
In this paper, we describe progress in the design of a LIBS system for downhole applications, currently under development at Honeybee Robotics.

Applicability of LIBS on the Moon: Elemental Analysis of Lunar Simulants in Vacuum [#1165]
Laser-induced breakdown spectroscopy (LIBS) is an active analytical technique that ablates and spectrally analyses material at a distance. We review the capability of LIBS for lunar rock and regolith analysis up to 1.5 m from a lunar rover.

Identifying Perchlorates Under Mars Conditions in Soil Samples and in Frozen Solutions Using LIBS [#1912]
We showed the feasibility of LIBS to distinguish between perchlorates and chlorides in pressed samples mixed with martian analogue material by applying principal component analysis. These salts can be distinguished in frozen salt water solutions.
Ollila A. M. Blank J. G. Wiens R. C. Lasue J. Newsom H. E. Clegg S. M. Cousin A. Maurice S. Preliminary Results on the Capabilities of the ChemCam Laser-Induced Breakdown Spectroscopy (LIBS) Instrument to Detect Carbon on Mars [#2395]
The ChemCam LIBS instrument, part of the 2012 MSL mission, is capable of detecting C. In this work, we identify C lines and C2 Swan features observed in spectra of samples taken in a Mars atmosphere using the ChemCam flight instrument.

We report on laboratory experiments conducted to characterize the removal of air-fall dust coatings using similar LIBS parameters as ChemCam under Mars-like conditions, to facilitate the analysis of ChemCam LIBS spectral data and RMI images.

ChemCam, which is in part of the MSL payload, uses the LIBS technique to investigate the martian surface. The capabilities of ChemCam for the depth profile have to be understood, as ChemCam will shoot several targets which can have alteration coating.

Rull F. Vegas A. Barreiro F. In-Situ Raman-LIBS Combined Spectroscopy for Surface Mineral Analysis at Stand-Off Distances [#2275]
A combined remote Raman-LIBS system for potential use in planetary surface analysis has been developed and results obtained at the field are presented and discussed.

Raman investigation onboard the ESA ExoMars 2018 rover mission. Science objectives and implementation, design concept. Laboratory model for development of the method and calibration.

Sansano A. López G. Rull F. AMASE 2010 Team Activities of Exomars’ Raman Laser Spectrometer Scientific Team During the Campaign AMASE 2010 [#2469]
In this work the preliminary results of the work of the RLS science team in the AMASE 2010 campaign are presented.

INO has developed a stand-off Laser Induced Fluorescence and Raman sensor and has measured mineral spectra from a distance of 10 meters. Identification is possible using a 355 nm excitation and analyzing the returned signal in the 390 to 640 nm range.

Blacksberg J. Rossman G. R. On-Surface Planetary Mineralogy Using Time Resolved Raman and Fluorescence Spectroscopy [#1166]
Raman spectroscopy is a prime candidate for in situ exploration of planetary bodies (e.g., Mars, Venus, Mars’ moons, asteroids). We present time-resolved spectroscopy to obtain Raman spectra in diverse planetary environments with extreme fluorescence.

Nathaniel T. A. Underwood C. I. Spatial Heterodyne Raman Spectroscopy [#1045]
This abstract presents the design and first results of the Spatial HEterodyne RAman instrument (SHERA). SHERA is a novel design for a compact planetary exploration Raman spectrometer using spatial heterodyne spectroscopy.

Compact combined remote Raman/Fluorescence spectroscopy and Lidar instrument for measuring surface mineralogy, surface organic materials and atmospheric constituents from planetary rovers and landers.

Riedo A. Fernandes V. A. S. M. Yakovleva M. Tulej M. Wurz P.

A Miniaturized Laser Ablation Mass Spectrometer for Space Research [#1880]
In this abstract we present current performance of our miniaturized Laser Ablation Time-of-Flight Mass Spectrometer (LMS) to be used for in situ planetary missions and laboratory elemental and isotopic analyzes.

Henkel T. Wong R. Longobardo A. Lockyer N.

Advances in the Analysis of Tiny Samples like Presolar Grains [#2305]
Every atom counts when analyzing tiny samples. Using femtosecond lasers for post-ionization of sputtered neutrals simplifies and improves elemental quantification and has the potential to boost the efficiency with which the samples are analysed.


Miniature Two-Step Laser TOF Mass Spectrometer with Reversible Ion Polarity [#2490]
We present details of the initial development of a two-step laser TOF mass spectrometer (L2MS) for enhanced in situ analysis of planetary samples for particular classes of organic compounds.

Klingelhöfer G. Morris R. V. Blumers M. Bernhardt B. Graff T.

The 2010 ILSO-ISRU Field Test at Mauna Kea, Hawaï: Results from the Miniaturized Mössbauer Spectrometers MIMOS II and MIMOS IIA [#2810]
The 2010 ILSO-ISRU Moon analogue field test on the Mauna Kea volcano in Hawaï was coordinated by NORCAT in collaboration with the Canadian Space Agency, the German Aerospace Center, and NASA.


A Mössbauer Microscope for Mineralogy in the Synchrotron Age [#1911]
We demonstrate a new microscope that has unique sensitivity to iron containing meteorites and minerals, using Mössbauer effect, with a resolution of a few micrometers.

Shanmugam M. Acharya Y. B. Goyal S. K. Murty S. V. S.

Alpha Particle X-Ray Spectrometer (APXS) On-Board Chandrayaan-2 Rover [#1232]
Alpha Particle X-ray Spectrometer (APXS) for ISRO’s Chandrayaan-2 rover, slated for launch in 2013.

Kobayashi M. Miyachi T. Nakamura M. H.

Cosmic Dust Detector Capable of Measuring Hypervelocity Speed Using Piezoelectric PZT [#2389]
We propose a cosmic dust detector capable of measuring hypervelocity speed (higher than about 7 km/s) using Piezoelectric PZT. The dust detector can observe the momentum and the speed and as a result the mass can be also derived.

Horanyi M. Sternovsky Z. Gruen E. Kempf S. Srana R. Postberg F.

LDEX+: Lunar Dust Experiment with Chemical Analysis Capability to Search for Water [#1656]
The LDEX+ instrument extends the capabilities of the currently developed Lunar Dust Experiment (LDEX) of the upcoming Lunar Atmosphere and Dust Environment Explorer (LADEE) mission to measure the chemical composition of the impacting particles in addition to their mass.
Clark P. E. Dunlop D.  
*SPACE (Surface Payloads and Advanced Concepts for Exploration) Open Access Database/Spreadsheet Tool and Working Group [#1112]*

An extensive open-source spreadsheet representing design, development history, applications, requirements, and operating characteristics of potential payloads and advanced concepts to support a broad range of applications is being made available.

Clark P. E. Millar P. S. Yeh P. S. Beaman B. Brigham D. Feng S.  
*Instrument Packages for Cold, Dark, High Radiation Environments [#1111]*

We are developing a small cold temperature instrument package concept that integrates cold temperature power system and radhard ULT ULP electronics into a ‘cold temperature surface operational’ version of a planetary surface instrument package.

Grimm R. E. Stillman D. E.  
*Progress in Prospecting for Near-Surface H₂O on the Moon and Mars with Dielectric Spectroscopy [#2550]*

A broadband relaxation is the principal low-frequency dielectric signature of low-abundance H₂O.

Miller R. S. Souza A. N. Lawrence D. J. Bussey B. J.  
*Hydrogen at the Lunar Poles: Search Strategies and Tradeoffs for a Surface-Based Neutron Spectrometer [#2002]*

We report initial results of performance and survey strategies for a neutron telescope capable of addressing the lunar-polar hydrogen exploration challenge.

Hardgrove C. J. Moersch J. E.  
*Geochemical Effects on Neutron Die-Away: Implications for the Mars Science Laboratory Dynamic Albedo of Neutrons Experiment [#2135]*

We have shown that strong reductions in the total number of thermal neutrons as well as shifts in arrival times may allow DAN, on-board the MSL rover Curiosity, to detect evaporitic Cl-rich deposits, Fe concretions or hydrothermal Si-rich materials.

Peplowski P. N. Hepplewhite P. D. Feldman W. C. Lawrence D. J. Hibbits C. A.  
*Considerations for the Operation of a ³He Proportional Counter in the Ganymede Radiation Environment [#1481]*

Simulations of the response of a neutron spectrometer in the Ganymede radiation environment are presented. The results are used to identify instrument modifications required as well as to quantify its ability to map water ice deposits on the surface during the JGO mission.

*Planetary Geochemistry Techniques: Probing In-Situ with Neutron and Gamma Rays (PING) Instrument [#2379]*

The Probing *in situ* with Neutrons and Gamma rays (PING) instrument uses a pulsed neutron generator and neutron and gamma-ray detectors to measure the surface and subsurface elemental composition of planetary bodies without the need for drilling.

*Nuclear Instruments for Planetary Science [#1782]*

The discussion about neutron and gamma spectrometry instruments is presented.

Kobayashi S. Mitani T. Takashima T. Karouji Y. Hasebe N.  
*The Lunar Geochemical Analysis by a Gamma-Ray Spectrometer for Next Lunar Explorations [#1721]*

The sensitivity of a gamma-ray spectrometer using a LaBr₃ detector has been estimated for the geochemical analysis (K, Th, U) of the central peak of a crater on the Moon. This study is for a future lunar mission to explore Procellarum KREEP terrain.
Reedy R. C.  
*Background Peaks in Bismuth Germanate: Nuclear Reactions with Bismuth [#2317]*  
Cross sections for nuclear reactions of neutrons and protons with Bi were evaluated and used to estimate relative production rates in BGO detectors in space. The largest production is by (n,x) reactions. High-energy reactions can make many nuclides.

Ciarletti V. Clifford S. Vieau A. J. Lustrement B. Hassen Khodja R. Cais P.  
*Results from the First Field Tests of the WISDOM GPR (2018 ExoMars Mission) [#2613]*  
Results from the first field tests of the WISDOM GPR (2018 ExoMars Mission) on Mount Etna.

Mars-XRD is a combined X-ray diffractometer and fluorescence spectrometer to analyse the mineralogy and chemical composition of Mars. We present our initial investigation into its ability to identify minerals under representative conditions.

Sarrazin P. Taylor G. J. Blake D. Vaniman D. Bish D.  
*XTRA: Extraterrestrial Regolith Analyzer [#2280]*  
XTRA is an XRD/XRF instrument for mineralogical analysis of regolith on air-less bodies. Very compact and lightweight, it will be suitable for missions to the Moon, Mercury, or asteroids on landers fitted with basic sample acquisition capabilities.

Young K. E. Evans C. Allen C. Mosie A. Hodges K. V.  
*In-Situ XRF Measurements in Lunar Surface Exploration Using Apollo Samples as a Standard [#2121]*  
We present handheld XRF data on 22 Apollo samples. We also discuss the development of three different deployment modes for this instrument.

Allwood A. C. Wade L. A. Hodyss R.  
*Micro-XRF: Fast, High Spatial Resolution Analysis of Rock and Soil Elemental Chemistry In Situ [#2725]*  
We are developing a Micro-XRF instrument for high-resolution measurements of rock chemistry, which will provide crucial information about the relationship of composition to texture.

*Synchrotron Micro-XANES Analysis of Fe^{3+} in Oriented Amphiboles [#2287]*  
Micro-XANES was performed for iron analysis on oriented amphibole crystals with the X-ray beam polarized along the X, Y, and Z optical directions. Results provide Fe^{3+} calibration curves useful for data acquisition on oriented amphibole grains in thin sections.

Okada T.  
*Calibration Method Using a Solar X-Ray Monitor with a Standard Sample for Planetary Remote X-Ray Spectroscopy [#1703]*  
Planetary remote XRF spectroscopy should provide major elemental composition as precisely as possible. Uncertainty of solar X-ray monitoring is a crucial topic on this, and we propose onboard calibration method with a standard sample.

*Mid-Infrared Imager for Mapping Thermal Emission off the Surface of Near-Earth Asteroid 1999JU3 in Hayabusa-2 [#1370]*  
A mid-infrared imager is being prepared for Hayabusa-2 to map thermal emission off the surface of a C-class near-Earth asteroid 1999JU3 and investigate surface physical properties with an assessment for landing site selection.
Cloutis E. A.  Hipkin V. J.  Wennberg P. O.  Wolff M. J.  Stromberg J. M.  Berard G. M.  
Mann P.  MATMOS Team  
**ExoMars Trace Gas Orbiter MATMOS Instrument: Preliminary Strategy for Development of a Dust Spectral Library [#1175]**  
A library of spectral dust signatures, utilizing long path IR transmission, dust-covered IR transparent disks, and modeling of reflectance spectra, is being developed in support of data analysis for the 2016 ExoMars Trace Gas Orbiter MATMOS solar occultation FTIR instrument.  

Pilorget C.  Bibring J.-P.  Berthe M.  
**MicrOmega: An IR Hyperspectral Microscope for the Phobos Grunt Lander [#1930]**  
MicrOmega IR is an ultra miniaturized near-infrared hyperspectral microscope dedicated to *in situ* analyses that has been developed in the framework of the Exomars mission. A demonstrator will be embarked on the Phobos Grunt mission.  

Lucey P. G.  Crites S. T.  
**Thermal Infrared Imaging Interferometer Performance for Planetary Applications [#1335]**  
Performance models of imaging interferometers using both cooled and uncooled arrays are tested against measurements to enable assessment for planetary applications.  

Maturilli A.  Helbert J.  D’Amore M.  
**An Overview of the Planetary Emissivity Laboratory (PEL) at DLR in Berlin [#1693]**  
In the Planetary Emissivity Laboratory (PEL) at DLR we measure emissivity at high $T$ under vacuum, low/moderate $T$ under purging, bi-directional reflectance and transmission at room $T$ under vacuum or purging, of planetary analogue materials from VIS to FIR.  

Helbert J.  Maturilli A.  
**Laboratory Emission Spectra at 500°C at the Planetary Emissivity Laboratory at DLR in Berlin — Challenges, Challenges and Even More Challenges . . . [#1794]**  
For the last four years we are upgrading the Planetary Emissivity Laboratory at DLR in Berlin to obtain emissivity spectra at temperatures realistic for Mercury and Venus. Here we report about the challenges encountered in this effort.
MARS AEOLIAN PROCESSES: SUSPENSION, SALTATION, AND BEDFORM MIGRATION  
Friday, 8:30 a.m. Waterway Ballroom 1

Chairs: Paul Geissler and Nathan Bridges

8:30 a.m. Bridges N. T. * Bourke M. C. Colon C. M. Diniega S. Geissler P. E. Golombek M. P. Hansen C. J. Mattson S. McEwen A. S. Stantzos N.  
*Planet-Wide Sand Movement on Mars as Documented by the HiRISE Camera [#1215]  
Bedform migration and sand changes are documented over much of Mars. This shows that winds in Mars’ present low density atmosphere are sufficient to move dunes and ripples in many areas of the planet.

8:45 a.m. Geissler P. E. * Stantzos N. W. Bridges N. T. HiRISE Science Team  
*Shifting Sands on Mars: 3 Case Studies [#2537]  
Repeated HiRISE observations show evidence for sand movement in intracrater dune deposits in the martian tropics, as well as in the north polar erg. These observations suggest that martian dunes are presently active, and not fossil relics of an earlier climatic epoch.

9:00 a.m. Bourke M. C. * Wray J. J.  
*Interdune Deposits Suggest High Groundwater in an Equatorial Crater on Mars [#2749]  
Strata exposed in an equatorial dunefield suggest a phase of high groundwater along a valley coincided with active aeolian dune migration.

9:15 a.m. Montgomery D. R. Becker S. K. Bandfield J. L. *  
*Wind-Carved Transverse Erosional Ridges on Mars [#2488]  
While the presence of active aeolian dunes has been clearly established on Mars, we report that some martian mega-ripple-like landforms are erosional features.

9:30 a.m. Sullivan R. * Banfield D. Collins L. R. Heineck J. T. Korda D. T.  
*Determining the Minimum Saltation Grain Size on Mars [#2651]  
The transition grain size between wind-driven saltation (ripples, dunes) and suspension (dust storms) on Mars is explored using numerical simulations and wind tunnel experiments. Results predict 20–70 µm, in accord with MER observations.

9:45 a.m. Waller D. A. * Greeley R.  
*Active Dust Devils on Mars: A Comparison of Data Returned from Six Spacecraft Landing Sites [#1122]  
Dust devils were imaged or inferred from meteorological measurements at all six successful martian landing sites. To study how these processes vary with location, dust devil sizes, speeds, normalized frequencies, dust flux, and dust loading were compared.

MARS GEOMORPHOLOGY: FLUVIAL  
Friday, 10:15 a.m. Waterway Ballroom 1

Chairs: Devon Burr and Justin Wilkinson

10:15 a.m. Gregg T. K. P. * Krysak D. J.  
*Apollinaris Mons, Mars: A New Name and a New Past [#1922]  
Geologic mapping of Apollinaris Mons, Mars, reveals that the volcano was active throughout the Hesperian and that the fan deposit is likely composed of pyroclastic or volcaniclastic materials.
10:30 a.m. Catling D. C. * Leovy C. B. Wood S. E. Day M. D.  
* A Lava Sea in the Northern Plains of Mars: Circumpolar Hesperian Oceans Reconsidered [#2529]  
The Vastitas Borealis Formation (VBF) in the martian northern plains is commonly attributed to sediments from a circumpolar Hesperian ocean of water. We present evidence that the VBF formed from a sea of flooded lava, not water.

10:45 a.m. Stepinski T. F. Luo W. *  
* On Orientation of Martian Valley Networks [#1266]  
Distribution of valley networks orientations is shown to be consistent with distribution of orientations of long baseline slopes.

11:00 a.m. Mangold N. *  
* Post-Early Mars Fluvial Landforms on Mid-Latitude Impact Ejecta [#1378]  
Fluvial landforms on ejecta of large craters were found in the mid-latitude band in both hemispheres. Processes associated with impact craters such as shallow water ice melted by warm ejecta are favored to explain this fluvial activity.

11:15 a.m. Cannarsa F. * Ori G. G.  
* Morphological Analyses of Relief-Inverted Channelled Distributary Systems in the Aeolis/Zephyria Plana Region: Insights from DEMs Data Set [#2169]  
We report morphometric analyses of a distributary system in the Aeolis/Zephyria Plana region of Mars carried out with a series of topographic profiles derived from the DEMs data set.

11:30 a.m. Hughes A. C. G. * Burr D. M. Moersch J. E. Murchie S. L. Buczkowski D. L. Seelos F. P. Seelos K. D.  
* A Mineralogic and Morphologic Analysis of Four New Phyllosilicate-Bearing Martian Fan Deposits [#2301]  
Our study examines 33 fan deposits to test multiple hypotheses for the formation mechanisms of these fans. This abstract presents the mineralogic and morphologic results for four fans newly identified to contain phyllosilicates.

11:45 a.m. Ori G. G. * Salese F.  
* Stratigraphic and Sedimentological Evidence for a Large-Scale Coarse-Grained Fluvial System (Southwest Shoulder of Juventae Chasma) [#1806]  
The Southwestern shoulder of the Juventae Chasma shows an extensive set of exhumed channels. The cliff bordering the Juventae Chasma cuts this fluvial system showing a conglomeratic unit interpreted as the result of braided channels deposition.

---

**EARLY SOLAR SYSTEM RESERVOIRS AND PROCESSES III: VOLATILES IN NEBULAR MATERIALS AND THE SOLAR WIND**  
**Friday, 8:30 a.m. Waterway Ballroom 4**

**Chairs:** Eric Quirico and Joseph Nuth III

8:30 a.m. Marty B. * Chaussidon M. Jurewicz A. J. G. Wiens R. C. Burnett D. S.  
* The Lowest $^{15}$N/$^{14}$N End-Member of the Solar System is the Sun [#1870]  
We have measured with a new ion probe the nitrogen isotopic composition of the solar wind sampled by the Genesis spacecraft and found the lowest $^{15}$N/$^{14}$N value known for solar system objects. We shall discuss its cosmochemical implications.
8:45 a.m. Huss G. R. * Nagashima K. Jurewicz A. J. G. Burnett D. S. Olinger C. T.
*Isotopic Composition of Solar Wind Nitrogen in a Genesis Bulk Solar Wind Collector [#1650]*
We present a new determination of the $^{15}\text{N}/^{14}\text{N}$ ratio in the solar wind. The Sun is $\sim$30% depleted in $^{15}\text{N}$ compared to Earth’s atmosphere, in agreement with results by the Nancy group. We also present data on the fluence of nitrogen in the solar wind.

9:00 a.m. Vogel N. * Baur H. Burnett D. S. Maden C. Wieler R.
*Argon, Krypton, and Xenon in Three Solar Wind Regimes as Collected by Genesis [#1767]*
We present new heavy noble gas fluxes and elemental compositions ($^{36}\text{Ar}/^{84}\text{Kr},^{84}\text{Kr}/^{132}\text{Xe}$) for the fast, slow, and CME-related solar wind as collected by Genesis in order to rule on element fractionation processes during solar wind formation.

*Isotopic Composition of Solar Wind Krypton in Aluminum Genesis Collectors [#2703]*
Our first successful measurements of isotopic composition of solar wind krypton are in good agreement with solar wind Kr analyses of regolith soils, indicating little, if any, temporal isotopic variations in solar wind krypton.

9:30 a.m. Crowther S. A. * Gilmour J. D.
*Solar Wind Xenon Composition Measured in Silicon Collector Targets from the Genesis Mission [#1969]*
We report a preliminary xenon isotopic composition for the present day solar wind, as sampled by the Genesis mission.

9:45 a.m. Alexander C. M. O’D. * Howard K. T. Bowden R. Fogel M. Bonal L.
*The Origin and Evolution of Chondritic Water [#1869]*
Bulk CM H abundances and isotopes are inversely correlated and both correlate with alteration indices. The estimated initial water composition ($\delta D \leq -450\%$) shows that most formed in the inner nebula, but $\leq 20\%$ could have come from the outer nebula.

10:00 a.m. Bonal L. * Alexander C. M. O’D. Huss G. R. Nagashima K.
*Hydrogen Isotopic Composition of the Water in CR Chondrites [#1287]*
The H-isotopic compositions of hydrous silicates were measured *in situ* in CR chondrites to better constrain the composition, evolution, and origin of asteroidal water.

10:15 a.m. Floss C. * Le Guillou C. Stadermann F. J. Brearley A. J.
*Coordinated NanoSIMS and TEM Analyses of C- and N-Anomalous Phases in the CR3 Chondrite MET 00426 [#1455]*
TEM/NanoSIMS study of C- and N-anomalous phases in MET 00426 shows that all grains consist of amorphous C with variable morphologies. Formation likely occurred under variable conditions, with isotopic fractionations inherited from simpler precursors.

*Pre-Accretion Heterogeneity of Organic Matter in Types 1 and 2 Chondrites [#2372]*
This study deals with the structure and composition of insoluble organic matter from type 1 and 2 chondrites by Raman, IR, and S-XANES microscopes. Preaccretion heterogeneity of IOMs or short-duration heating is propose to account for measurements.
10:45 a.m. Le Guillou C. * Remusat L. Bernard S. Brearley A. J.
Redistribution and Evolution of Organics During Aqueous Alteration: NanoSIMS-STXM-TEM Analyses of FIB Sections from Renazzo, Murchison and Orgueil [#1996]
What is the in situ spatial distribution and environment of organic grains in carbonaceous chondrites matrices? They seem to evolve physically and chemically during aqueous alteration and show relationship with phyllosilicates and carbonates.

11:00 a.m. Monroe A. A. * Pizzarello S.
The Soluble Organic Composition of a Pristine Bells Fragment [#1086]
A pristine Bells fragment was analyzed for its soluble organic compounds and revealed a distinct composition. This meteorite is rich in O-containing and hydrocarbon molecular species but depleted in N-containing ammonia, amines, and amino acids.

Amorphous Carbon Grains in the Murchison Meteorite [#2604]
We have located a series of micron-sized amorphous carbonaceous grains in size and density separations of Murchison matrix. We argue that the grains lost their crystalline structure through ion irradiation by the solar wind in the proto-solar nebula.

11:30 a.m. Nuth J. A. III * Johnson N. M. Elsila-Cook J. Kopstein M.
Carbon Isotopic Fractionation During Formation of Macromolecular Organic Grain Coatings Via FTT Reactions [#1167]
Measurements of the temperature dependent carbon isotopic fractionation between input CO gas and carbonaceous grain coatings show that the coatings are light for temperatures above 600 K but may be heavy for lower temperatures.

11:45 a.m. Mercer J. A. * Sharp Z. D. Jones R. H.
The Chlorine Isotope Composition of Chondrites [#2463]
Bulk chlorine isotopic analyses of C and O chondrites give \( \delta^{37}\text{Cl} \) values that range from \(-2.0\) to \(+0.5\)‰, which is \(7\)% less than previously reported values.

**VESTA AND HED METEORITES: THE PRE-DAWN PERSPECTIVE**
Friday, 8:30 a.m. Waterway Ballroom 5

Chairs: David Mittlefehldt and Timothy McCoy

8:30 a.m. Delaney J. S. *
*Stratigraphy of a Basaltic Planetoid — 4 Vesta and the HEDs [#2399]*
Correlation of all lithic components in the HEDs can be used to produce a planetoidal stratigraphy for Vesta by examining both the chronological and the spatial relationships of lithic clasts to one another.

8:45 a.m. Ivanov B. A. Melosh H. J. * Pierazzo E.
The South Pole Impact Crater on Vesta: Numerical Modeling [#1717]
We present two-dimensional numerical modeling of the South Pole impact crater formation with self-gravity and the acoustic fluidization model. Our results are in favor of \(~80\) km projectile diameter.
9:00 a.m. Wittmann A. * Hiroi T. Ross D. K. Herrin J. S. Rumble D. III Kring D. A.
Eucrite Impact Melt NWA 5218 — Evidence for a Large Crater on Vesta [#1984]
NWA 5218 is a clast-rich eucrite impact melt rock, which may have resulted from an impact that
affected the mid-to lower crust of Vesta; its reflectance spectra may be useful for DAWN to identify
melt outcrops on Vesta.

9:15 a.m. Smith S. E. * Mayne R. G. Corrigan C. M.
Petrology and Mineralogy of Fine-Grained Eucrites as a Guide to Understanding the
Petrogenesis of Vesta [#1268]
The differentiated asteroid Vesta offers us the opportunity to understand the processes of planetary
formation using its associated meteorite group, the howardite-eucrite-diogenite (HED) suite. Two
models of formation will be tested using quenched eucrite clasts within howardites.

Early Basaltic Volcanism and Late Heavy Bombardment on Vesta: U-Pb Ages of Small Zircons and
Phosphates in Eucrites [#2575]
We report a new technique to determine U-Pb ages in very small zircons (<5 µm) and apatite in eucrites
by the Cameca ims 1280 ion probe. The new apatite age for eucrites suggests late heavy bombardment
may have started as early as 4.1 Ga.

9:45 a.m. Righter M. * Lapen T. J. Shaulis B.
U-Pb and 207Pb-206Pb Ages of Zircons from Basaltic Eucrites [#2740]
We analyzed U-Pb and 207Pb-206Pb ages of zircons from three basaltic eucrites. The preliminary U-Pb
and 207Pb-206Pb ages of zircons are both 4546 ±13 Ma, which is consistent with inferred formation age of
eucrite basalt (4.56 Ga).

10:00 a.m. Mittlefehldt D. W. * Herrin J. S. Cartwright J. A.
The Regolith of 4 Vesta — Inferences from Howardites [#2569]
The vestan regolith, represented by howardites, is different in detail from lunar regolith breccias.
Our petrologic and compositional studies on howardites will be discussed in the context of the differing
surface environments of Vesta and the Moon.

10:15 a.m. Cartwright J. A. * Herrmann S. Herrin J. Mittlefehldt D. W. Ott U.
Noble Gas Analysis in the Quest to find “Regolithic” Howardites [#2655]
Noble gas analysis of howardites has been used to assess the regolithic nature of these meteorites, based
on parameters suggested in previous work. This research will aid understanding of regolith formation
processes on asteroids and other planetary bodies.

10:30 a.m. Johnson K. N. * Herrin J. S. Mittlefehldt D. W.
Investigation of Orthopyroxene Diversity in Howardite Meteorites [#2073]
Integration of laser ablation ICP-MS analysis of eight howardite samples with XRF data, EMPA data
points, noble gas abundance results, and petrographic descriptions provides some preliminary
interpretations of regolithic classification.

10:45 a.m. Boesenberg J. S. * Erb I. R.
Formation of Ti-Cr Fractionation Trends in Howardite Pyroxene [#1017]
Up to 6 different Ti/(Ti + Cr) vs. Fe/(Fe + Mg) trends have been determined in pyroxene from 8 of 11
howardites. These trends suggest that the eucritic and diogenitic clasts in howardites form during
continuous, fractional crystallization sequences.
11:00 a.m. Herrin J. S. * Zolensky M. E. Cartwright J. A. Mittlefehldt D. W. Ross D. K.  
*Carbonaceous Chondrite-Rich Howardites: The Potential for Hydrous Lithologies on the HED Parent* [#2806]

Recent chondrite-rich Antarctic howardite finds further document the contribution of CM chondrite impactors to the HED parent surface, and indicate that local concentrations of hydrous material may exist on the nominally anhydrous HED parent.

*Further Evidence for Multiple Diogenite Lithologies: Trace Element Variations in Diamict Diogenites* [#2259]

We investigate *in situ* trace element concentrations in five diogenites, proposed to contain two lithologies. Our results support this proposal, showing trace element trends that are best explained by the sampling of two lithologies, separated via fractionation.

*Abundances of Highly Siderophile Elements in Diogenites Compared with the Mantles of Earth, Mars and the Moon: Consistent with Stochastic Late Accretion?* [#1386]

Abundances of highly siderophile elements (HSE) in the terrestrial, martian, and lunar mantles are consistent with stochastic late accretion. The large variance in HSE concentrations among diogenites appears consistent with this process.

---

**LUNAR IMPACTS I: TIMING AND CAUSES OF LUNAR BOMBARDMENT**  
**Friday, 8:30 a.m. Waterway Ballroom 6**

**Chairs:** Jeff Plescia and Katherine Joy

8:30 a.m. Frey H. V. * Romine G. C.  
*New Candidate Large Lunar Basins from LOLA Data* [#1190]

LOLA data provide evidence for new large lunar basins not previously recognized in earlier, lower-resolution topographic data. The number >300 km in diameter likely exceeds 100, more than twice the number suggested from photogeologic studies.

8:45 a.m. Marchi S. * Bottke W. F. Kring D. A. Morbidelli A.  
*New Crater Counts on the Lunar Farside* [#1192]

In order to study the early evolution of the Moon, we performed new crater counts using LOLA/LRO data on selected pre-Nectarian terrains on the lunar farside. We present the derived crater size-frequency distributions and discuss their observed differences and similarities.

9:00 a.m. Kirchoff M. R. * Sherman K. M. Chapman C. R.  
*Reevaluation of Lunar Impactor Population Evolution: Preliminary Results from Crater Distributions on Diverse Terrains* [#2702]

We discuss implications for secondary cratering and evolution of the external impactor population from lunar impact crater size-frequency distributions. We also present an assessment of human variation in crater identification and measurement.

9:15 a.m. Fischer-Gödde M. * Becker H.  
*What is the Age of the Nectaris Basin? New Re-Os Constraints for a Pre-4.0 Ga Bombardment History of the Moon* [#1414]

A Re-Os isochron age of 4.21 ± 0.13 Ga on Apollo 16 impact melt rock 67935 supports an older age for the Nectaris Basin and places critical constraints on the lunar flux rate and the late heavy bombardment hypothesis.
9:30 a.m. Galenas M. G. * Gerasimenko I. James O. B. Puchtel I. S. Walker R. J.  
Continued Study of Highly Siderophile Element Characteristics of Apollo 17 Impact Melt Breccias [#1413]  
$^{187}$Os/$^{188}$Os and Ru, Pd, Re, Ir, Os, and Pt abundances for impact melt breccias 72435, 72535, and 73235 are reported. Results were similar to measured poikilitic Apollo 17 rocks consistent with the interpretation of one single Serenitatis impactor.

9:45 a.m. Joy K. H. * Kring D. A. Zolensky M. E. McKay D. S. Ross D. K.  
Investigating the Sources and Timing of Projectiles Striking the Lunar Surface [#2103]  
The lunar surface is exposed to bombardment by asteroids, comets, and debris from them. Here we investigate the impact archive preserved in the Apollo 16 regolith breccias, and compare this record to evidence of projectile species in other lunar samples.

10:00 a.m. Nyquist L. E. * Shih C.-Y. Reese Y. D.  
Dating Melt Rock 63545 by Rb-Sr and Sm-Nd: Age of Imbrium; SPA Dress Rehearsal [#1868]  
Melt rock 63545 yields Sm-Nd and Rb-Sr ages of 3.91 ± 0.10 and 3.84 ± 0.10 Ga showing that melt rocks can be dated by isochron techniques. The age of 63545 agrees with those of Apollo 15 KREEP basalts, consistent with its being Imbrium basin ejecta.

10:15 a.m. Fernandes V. A. S. M. * Fritz J. P.  
$^{40}$Ar/$^{39}$Ar Ages vs. Shock Features in Apollo 16 and 17 Samples [#1189]  
SEM, Raman spectroscopy, and optical microscopy studies to complement $^{40}$Ar/$^{39}$Ar age determination of lunar rocks: the process of K-Ar clock resetting in low shocked rocks does not have an “evident” petrologic feature to enable easy assessment.

10:30 a.m. Zhang A. C. * Hsu W. B. Li X. H. Ming H. L. Li Q. L. Liu Y. Tang G. Q.  
Polycrystalline Zircon in Lunar Meteorite Dhofar 458: Origin and Implications [#1056]  
We report the occurrence of a polycrystalline zircon in lunar meteorite Dhofar 458. The texture of the zircon was shock-induced and indicates that the host rock is an impact melt rock. SIMS U-Pb dating gave a recrystallization age of 3.4 Ga.

10:45 a.m. Spudis P. D. * Wilhelms D. E. Robinson M. S.  
Sculptured Hills: Implications for the Relative Age of Serenitatis, Basin Chronologies, and the Cratering History of the Moon [#1365]  
New LROC WAC images show the distribution and relations of Sculptured Hills, a knobby unit found between the Serenitatis and Crisium basins. The characteristics of this unit have significant implications for the sequence of impact basins and the lunar cataclysm.

11:00 a.m. Bottke W. F. * Vokrouhlicky D. Minton D. Nesvorný D. Morbidelli A. Brasser R. Simonson B.  
The Great Archean Bombardment, or the Late Late Heavy Bombardment [#2591]  
Using our new LHB model (i.e., the E-belt), we show that while lunar basin formation ended at ~3.7 Ga, it continued on Earth throughout the Archean. As our “smoking gun,” we reproduce Earth’s distribution of impact-generated spherule beds.

11:15 a.m. Garvin J. B. * Mitrofanov I. Malakhov A. Frawley J.  
Relationship Between LRO LEND Neutron Flux and Lunar Impact Crater Ages [#2538]  
The relationship between neutron flux and impact crater ages on the Moon is evaluated on the basis of LRO LEND data and new crater geometry measurements from LOLA.
11:30 a.m.  Plescia J. B. *  Robinson M. S.
New Constraints on the Absolute Lunar Cratering Chronology [#1839]
Published crater counts for young dated craters under-report frequencies; counts for young crater ejecta include auto-seconds; absolute model ages with LROC data are greater than actual age; and chronology for young ages has major uncertainties.

FROM MANTLE TO CRUST: MARTIAN PETROLOGY AND GECHEMISTRY
Friday, 1:30 p.m.  Waterway Ballroom 1

Chairs:  John Skok and Mariek Schmidt

1:30 p.m.  Shih C.-Y. *  Nyquist L. E.  Reese Y.  Irving A. J.
Rb-Sr and Sm-Nd Ages, and Petrogenesis of Depleted Shergottite Northwest Africa 5990 [#1846]
A Sm-Nd isochron for NWA 5990 yields T = 402 ± 22 Ma and εNd = +42 ± 1. Model calculations suggest depleted shergottites were melts from highly LREE-depleted sources after prior extractions of nakhlite-like magmas from nakhlite-like sources ~1 Ga ago.

1:45 p.m.  Usui T. *  Shearer C. K.  Righter K.  Jones J. H.
Effect of Sulfur on Siderophile Element Partitioning Between Olivine and Martian Primary Melt [#1670]
Although S dissolved in silicate melts has a barely discernible effect on siderophile element partitioning, it is not enough to explain incompatible signatures of Ni and Co in shergottite olivines even in high-S (>3000 ppm) conditions.

2:00 p.m.  Balta J. B. *  McSween H. Y.
Are Megacrysts in Olivine-Phyric Shergottites Xenocrysts, Phenocrysts, or Something Else? [#1033]
We argue based on detailed analyses and modeling of shergottite LAR 06319 that its olivines are antecrysts, formed from a melt similar to the current groundmass and entrained from a cumulate pile prior to eruption.

2:15 p.m.  Ody A. *  Poulet F.  Langevin Y.  Bibring J.-P.  Gondet B.  Carter J.  Vincendon M.
Global Distribution of Igneous Minerals on Mars: Assessing the Composition of the Crust [#2459]
The work presented here provides a global and final dataset of surface mineralogy of the mafic minerals (olivines, pyroxene), as revealed by the OMEGA instrument, in order to study their implication in crust formation and evolution.

2:30 p.m.  Mikouchi T. *  Kasama T.  Kurihara T.
More on Nano-Particles in Olivine from the Northwest Africa 1950 Shergottite [#1689]
We analyzed olivine in NWA 1950 shergottite by an advanced TEM (FEI Titan 80–300) and found abundant nano-particles (1–20 nm). They are primarily Fe metal with minor hematite. The Fe metal formed by shock and probably altered to hematite by FIB.

2:45 p.m.  Skok J. R. *  Mustard J. F.  Tornabene L. L.
Spectroscopic and Morphological Analysis of Alga Crater’s Central Peak: Implications for Mars Primary Crust Formation [#1959]
A morphological and compositional analysis of the central peak of Alga Crater to examine an excavated section of the unaltered igneous Noachian crust of Mars.
3:00 p.m. Edwards C. S. * Christensen P. R.
A relatively thin, global or semi-global, rocky, olivine-rich layer has been identified. We propose that the most likely scenario for the formation of a layer with these characteristics and extent is directly related to a mega-impact event.

3:15 p.m. Crumpler L. * Athena Science Team
Summary of Regional Martian Geologic History from In Situ Stratigraphic Measurements in the Columbia Hills, Gusev Crater, MER Spirit Rover [#2531]
Correlation of stratigraphic sections measured along the Columbia Hills transect by Spirit identifies secular trends that reflect regional and global changes in the geologic environments on Mars over time.

3:30 p.m. Schmidt M. E. * Schrader C. M. McCoy T. J.
How Oxidized are the Gusev Basalts? [#2277]
Magmatic oxygen fugacities are estimated for the Gusev basalts and found to be similar to those found in the shergottitic meteorites.

3:45 p.m. Shearer C. K. * Burger P. V. Sutton S. R. Papike J. J. McCubbin F.
REE Crystal Chemistry of Phosphates in Extraterrestrial Basalts at Different Oxygen Fugacities. Direct Determination of Europium Valence State in Merrillite-Whitlockite [#1143]
Direct measurement of Eu$^{2+}$ and Eu$^{3+}$ in merrillite illustrate the relationships between oxygen fugacity and merrillite REE crystal chemistry in martian and lunar basalts.

4:00 p.m. Hicks L. J. * Bridges J. C. Gurman S. J. Changela H. G.
Oxidation of the Nakhlite Martian Meteorites During an Impact Hydrothermal Event [#1790]
To constrain the oxidation state of hydrothermal fluids on Mars, Fe k XANES has been performed on nine nakhlites. Pre-absorption edge features reveal an increase in Fe$^{3+}$/Fe$^{2+}$ within alteration veins compared to surrounding minerals.

4:15 p.m. McSween H. Y. * Hahn B. C. Viviano C. E. Moersch J.
Onset of Metamorphism in the Martian Crust [#1064]
Metamorphic mineral assemblages provide important constraints on geothermal gradients, protoliths, and phases not yet identified by remote sensing.

4:30 p.m. Hamilton V. E. * Rogers A. D.
A New View of Martian Surface Geochemistry [#1273]
We present new global weight percent oxide maps of Mars calculated from TES mineralogy, compare our values to previous work, and show consistency with martian weathering trends. Our data reveal statistically distinguishable regional variations in chemistry.
Oxygen Isotopic Composition of Secondary Carbonates in CR1 Chondrite GRO 95577

CR1 chondrite GRO 95577 carbonates may be anomalously young. To verify that carbonate is extraterrestrial and interpret oxygen isotopic evolution during aqueous alteration, we report SIMS oxygen isotopic compositions of Ca-carbonate and siderite.

Alteration History of CR2 Chondrite GRA 06100: FE-EPMA and TEM Analysis

FE-EMP/TEM study of CR2 GRA 06100 showing evidence of aqueous alteration and thermal metamorphism, probably driven by impact event.

Evaluation of Parent Body Processes on Presolar Components in Chondrites: Osmium Isotopes in Acid Residues from CM and CR Chondrites

We present evidence recorded in the Os-isotope compositions of acid residues from CM and CR chondrites with a variety of petrologic grades, that aqueous alteration in the meteorite parent bodies has preferentially destroyed some presolar phases.

Evolution of Carbonate Mineralization in the CM2 Carbonaceous Chondrites

The CM2 carbonaceous chondrites contain multiple generations of carbonate minerals including aragonite, breunnerite, calcite and dolomite. The mineralization sequences recorded in different meteorites can elucidate genetic relationships between CM2s.

Alteration of Coarse-Grained Fe and Fe,Ni Sulfides in the Mighei CM2 Carbonaceous Chondrite: Evidence for the Instability of Primary Pyrrhotite-Pentlandite Grains During Aqueous Alteration

SEM and TEM studies of composite pyrrhotite-pentlandite grains from the Mighei CM2 chondrite show the earliest stages of replacement during aqueous alteration.

Low-Temperature Concentration of Nickel in CI-Chondrite Pyrrhotite Grains

We discuss the chemistry, crystal structure, and genesis of CI-chondrite pyrrhotite grains with atypical nickel concentrations.

Mn-Cr Age of Dolomite in the Ivuna CI Chondrite

Dolomite in the Ivuna CI chondrite shows a Mn-Cr age of 4562.5 Ma. This is comparable to Mn-Cr ages of calcite and dolomite in CM chondrites and older than those of breunnerite in Orgueil, indicating that aqueous alteration lasted at least 10 Ma.
3:15 p.m. Zolotov M. Yu. *
Fluid Chemistry of Aqueous Alteration of CI-Type Chondritic Materials: Thermodynamic Assessment [#1988]
Alkaline NaCl rich solutions are common in closed water-chondrite systems (without H₂ removal) while Mg-Na-SO₄-Cl fluids form in H₂-repleted high-temperature conditions.

3:30 p.m. Jogo K. * Krot A. N. Nagashima K.
Heavily-Metamorphosed Clasts in the CV Carbonaceous Chondrite Mokoia: Evidence for Strong Thermal Metamorphism on the CV Parent Asteroid [#1613]
The mineralogy and O-isotope compositions of heavily-metamorphosed clasts from the Mokoia CV breccia are consistent with those of CV chondrites, suggesting an origin of the clasts in the interior of the CV parent asteroid.

3:45 p.m. Davidson J. * Lauretta D. S. Schrader D. L.
Compositional Variations in Opaque Phases Within the CV and CK Carbonaceous Chondrites [#1886]
We present compositional data for opaque assemblages in a number of CV and CK chondrites. Data illustrate a large diversity; systematic study of these assemblages will enable us to understand larger scale processes on the parent asteroid(s).

4:00 p.m. Ganguly J. * Chakraborty S.
Thermal History of H-Chondrite Parent Asteroid: An Integrated Model Satisfying Thermometric, Diffusion Kinetic and Thermochronometric Data [#2155]
We present a model of the thermal history of the H-chondrite parent Asteroid integrating new thermometric data, diffusion kinetic analysis of resetting of mineral compositions and available thermochronometric constraints.

4:15 p.m. Dobrica E. * Brearley A. J.
Widespread Hydrothermal Alteration Minerals in the Fine-Grained Black Matrix of the Tieschitz Unequilibrated Ordinary Chondrite [#1889]
The black matrix of Tieschitz ordinary chondrite show the presence of widespread voids filled with amphibole and elongated Fe-rich olivines providing definitive evidence of the importance of hydrothermal processes in the metamorphic evolution.

4:30 p.m. Sharp T. G. * Tricky R. Hu J. Xie Z. De Carli P. S.
Silicate-Perovskite in Acfer 040: A Very High Shock Pressure of only 26 GPa [#2820]
Here we use the mineralogy and microstructures of high-pressure minerals in Acfer 040 to show that the shock veins crystallized at a pressure (~26 GPa) that is high relative to other highly shocked L6 chondrites.

**COLDMEMBER: ICY OCEAN WORLDS**
Friday, 1:30 p.m. Waterway Ballroom 5

**Chairs:** Joshua Emery and William McKinnon

1:30 p.m. Vance S. D. * Brown J. M.
Laboratory Simulations of Ammonia-Rich Oceans in Icy Worlds [#1563]
We discuss recent acquisition and analysis of sound velocities in aqueous ammonia to 800 MPa pressure, in the range ~20° to 100°C, conditions relevant to deep icy world oceans.
1:45 p.m. Ishimaru R. * Sekine Y. Matsui T. Mousis O.
**Oxidizing Proto-Titan: Constraint from the Impact Origin of Its N₂ Atmosphere [#1358]**
We show that a CO₂-rich oxidizing proto-atmosphere is necessary to form Titan’s current N₂ atmosphere by impact shock heating, implying that the chemical composition of satellitesimals that formed the saturnian system containing Titan should be oxidizing.

2:00 p.m. Estrada P. R. * Mosqueira I.
**Titan’s Accretion and Long Term Thermal History [#1679]**
We investigate Titan’s long-term thermal evolution starting with its accretion history. We describe the structure of the interior and how Titan can avoid complete differentiation over its lifetime.

2:15 p.m. O’Rourke J. G. * Stevenson D. J.
**Stability of Ice/Rock Mixtures with Application to Titan [#1629]**
Motivated by recent gravity data, the thermal evolution of Titan’s deep interior is modeled with double-diffusive convection theory, concluding that a partially differentiated ice/rock interior likely could not avoid differentiating.

2:30 p.m. Spencer J. R. * Howett C. J. A. Verbiscer A. J. Hurford T. A. Segura M. E. Pearl J. C.
**High-Resolution Observations of Thermal Emission from the South Pole of Enceladus [#2553]**
We discuss the spatial distribution and temperature of the 7–16-µm endogenic thermal emission from Enceladus, measured by the Cassini Composite Infrared Spectrometer on seven flybys between March 2008 and August 2010.

2:45 p.m. Matson D. L. * Castillo-Rogez J. C. Johnson T. V. Lunine J. I. Davies A. G.
**Enceladus and Europa: How Does Hydrothermal Activity Begin at the Surface? [#1565]**
The question of how the surface hydrothermal activity (e.g., eruptive plumes and heat flow) is initiated can be addressed within the framework of our “Perrier Ocean” model. A number of processes for doing this will be discussed.

3:00 p.m. Han L. * Tobie G. Showman A. P.
**The Dichotomy of Thermal Convection in Enceladus’ Ice Shell [#2211]**
We perform numerical simulations in three-dimensional spherical geometry to explain the dichotomy of thermal convection in Enceladus’ ice shell by implementing temperature-dependent viscosity and a weak south pole.

3:15 p.m. Patthoff D. A. * Kattenhorn S. A.
**Separating Old and Young: The South Polar Dichotomy on Enceladus [#2700]**
On Enceladus, a narrow band of deformation separates the young south polar terrain from the older regions to the north. This study characterizes the dichotomy and determines its relationship to the present-day and paleo tiger stripes.

3:30 p.m. Barr A. C. *
**Strain History of the Ice Shells of the Galilean Satellites from Radar Sounding [#2212]**
Crystal orientation fabric, indicative of strain history, can cause radar reflections in terrestrial ice sheets. I show that fabric can form and be detected in the Galilean satellites, providing a way of testing hypotheses about ice shell geology.

3:45 p.m. Pappalardo R. T. *
**What We Don’t Know About Europa [#1635]**
Given Europa’s high astrobiological potential, bizarre geology, and intriguing geophysical processes, twelve questions can be posed which, once answered, would contribute to changing our paradigm regarding Europa.
4:00 p.m. Schmidt B. E. * Blankenship D. D.
_A Melt-Hydrofracture Model for the Formation of Europa’s Chaos Terrain [#2105]_
We present a new model for formation of Europa’s chaos terrain based on lessons drawn from the Earth’s cryosphere.

4:15 p.m. Kattenhorn S. A. * Kay J. P.
_Geologically Young Troughs on Europa May Be Active [#1561]_
We compare the orientations of troughs on Europa with global stress fields over a range of nonsynchronous rotation rates to determine age of formation. Troughs may have formed hundreds to tens of thousands of years ago and could thus still be active.

4:30 p.m. Bland M. T. * Singer K. N. McKinnon W. B. Schenk P. M.
_Constraints on Ganymede’s Thermal Evolution from Models of Crater Relaxation [#1814]_
We combine high-resolution topography data of viscously relaxed craters on Ganymede with numerical modeling of crater relaxation to constrain the thermal evolution of the satellite.

---

**LUNAR IMPACTS II: BASINS, CRATERS, AND IMPACT MELTS**

*Friday, 1:30 p.m.  Waterway Ballroom 6*

**Chairs:** Noah Petro and Veronica Bray

1:30 p.m. Potter R. W. K. * Collins G. S. Kring D. A. Kiefer W. S. McGovern P. J.
_Numerical Modeling of Lunar Multi-Ring Basins [#1452]_
We compare our numerical impact model with observations of crustal structure beneath lunar basins to test our model and further understanding of basin formation.

_Thermal Evolution of Large Lunar Impact Basins: Implications for Basin Compensation and the Duration of the Lunar Cataclysm [#2349]_
We calculate the long-term thermal evolution of large lunar impact basins, using the results of hydrocode impact simulations to define the initial thermal state. We use the results to assess the nature of isostatic and flexural compensation of the basin center and basin rim.

2:00 p.m. Balcerski J. A. * Hauck S. A. II Dombard A. J.
_Preservation of Superisostasy in Large Lunar Basins [#2432]_
Numerical viscoelastic models of isostatically overcompensated lunar basins of 400–1000 km in diameter indicate that preservation of this superisostasy is likely to occur even in conditions where temperatures reach 1000 K at the crust-mantle interface.

2:15 p.m. Kreslavsky M. A.*
_New Observational Evidence of Strong Seismic Effects of Basin-Forming Impacts on the Moon [#1531]_
A map of kilometer-scale roughness shows that Orientale ejecta have a very distinctive roughness signature, while ejecta of other large impact basins do not. This is interpreted as a result of intensive seismic effect of the Orientale-forming impact.

2:30 p.m. Wieczorek M. A. * Weiss B. P. Stewart S. T.
_The Fate of the South Pole-Aitken Impactor and the Origin of Lunar Magnetic Anomalies [#1696]_
The most prominent concentrations of lunar magnetic anomalies are located on the northern rim of the South Pole-Aitken basin. These anomalies are consistent with magnetized iron-rich ejecta from an oblique South Pole-Aitken forming impact event.
2:45 p.m. Petro N. E. * Jolliff B. L.  
*Basin and Crater Ejecta Contributions to the South Pole-Aitken Basin (SPA) Regolith: Positive Implications for Robotic Surface Samples [#2637]*  
The center of the South Pole-Aitken Basin (SPA) has accumulated ejecta from basins, distal craters, and local craters. Despite its age, the interior of SPA retains a significant amount of SPA-derived impact melt.

3:00 p.m. Schultz P. H. * Stickle A. M.  
*Arrowhead Craters and Tomahawk Basins: Signatures of Oblique Impacts at Large Scales [#2611]*  
Expressions of the coupling stage of cratering become more evident at basin scales, low impact angles, and significant surface curvature. Laboratory experiments and numerical modeling reveal possible surface expressions of impactor failure and downrange scouring.

*Highland Smooth Plains, an Exceptional Grouping [#2511]*  
LROC NAC images reveal an unusual grouping of smooth plains deposits in the central farside highlands. Their morphology and young age suggest emplacement as impact melt; however, there is no apparent source crater in the region.

3:30 p.m. Wittmann A. * Lapen T. Swindle T. D. Kring D. A.  
*Petrography and Provenance of Impact Melt and Granulite Particles from the Ancient Regolith Breccias 60016, 61135, and 66035 [#2289]*  
Granulite and melt particles in ancient regolith breccias 60016, 61135, and 66035 formed in variably energetic impacts, and record their provenance from feldspathic, noritic, and KREEP-rich precursor rocks during the basin forming epoch on the Moon.

3:45 p.m. Fagan A. L. * Neal C. R.  
*Crystallization Conditions of Apollo 16 Impact Melts [#2137]*  
We use crystal stratigraphy to examine the petrogenesis of Apollo 16 impact melt 60635, which contains plagioclase crystals with surprising negative Eu anomalies.

4:00 p.m. Steele A. * McCubbin F. M. Fries M. Glamoclija M. Kater L. Nekvasil H.  
*Graphite in an Apollo 17 Impact Melt Breccia [#1585]*  
We have detected discrete grains of graphite in an Apollo 17 impact melt breccia.

4:15 p.m. Wells K. S. * Campbell D. B. Campbell B. A. Carter L. M.  
*A New View of Tycho and Copernicus Craters’ Secondary Crater Populations [#1535]*  
We investigate the abundance and distribution of Copernicus and Tycho secondary craters using 2.38-GHz Arecibo-Green Bank Telescope radar circular polarization ratio mosaics.

4:30 p.m. Plescia J. B. * Cintala M. J. Robinson M. S. Barnouin O. Hawke B. R.  
*Impact Melt in Small Lunar Highlands Craters [#2033]*  
Impact melt occurs as pools and veneers in fresh, simple craters as small as 200–300 m. Volumes are consistent with that expected from theory. But, it is unclear why such small volumes are preserved as well-defined deposits and not ejected.
INTERPLANETARY AND PRESOLAR DUST

Bradley J. P. Wozniakiewicz P. J. Ishii H. A. 
*Constraints on the Cosmochemical Significance of Element/Si Ratios and Oxygen Isotopic Compositions of GEMS from IDPs Collected in Silicone Oil [#1320]*

The cosmochemical significance of depletions in average element/Si ratios and normal (solar) oxygen isotopic compositions of GEMS in CP IDPs requires reassessment because residual silicone oil contamination reduces the former and dilutes the latter.

Fisenko A. V. Semjonova L. F. 
*Analysis of the Release Kinetics of Xe-HL and Xe-P6 During Pyrolysis of the Meteoritic Nanodiamonds [#1377]*

Analysis of release kinetics Xe-HL and Xe-P6 from the meteoritic nanodiamonds on data of Huss and Lewis is shown that thermostability of diamond depends on a degree thermal metamorphism and reducing-oxidizing properties of their parental bodies.

Krestina N. Petaev M. I. Jacobsen S. B. 
*Preliminary SEM Studies of Dust Particles from the L2021 and L2036 NASA Collectors: Are All TCNs Terrestrial Contaminants? [#2615]*

Among five particles from the L2021 (E8; E9; D1; D16) and L2036 (C7) collectors, three — L2021 (E8), L2021 (D16), and L2036 (C7) — are reclassified as C-type. It is possible that more particles labeled as TCNs may also be of extraterrestrial origin.

COSMOCHEMICAL ORIGINS: PHOTOCHEMISTRY, TRANSPORT, AND DISK EVOLUTION

Canup R. M. 
*Conditions in an Infall-Supplied Protoplanetary Disk [#1245]*

Here concepts developed in Canup and Ward (2002, 2006) for protosatellite disks are extended to the circumstellar environment to explore an actively supplied protoplanetary disk as a possible alternative to the minimum mass solar nebula.

Moudens A. Mousis O. Petit J.-M. Wurm G. Cordier D. Charnoz S. 
*The Role of Photophoresis in the Radial Transport of Hot Minerals in the Solar Nebula [#1409]*

We investigate the possibility that photophoresis provides a viable mechanism to transport high-temperature materials from the inner solar system to the regions in which the comets were forming.

Pahlevan K. Stevenson D. J. 
*Unstratified Mixing After the Moon-Forming Giant Impact [#2746]*

We quantify the degree of isotopic fractionation that could exist between the silicate Earth and Moon in the context of the unstratified equilibration hypothesis.

*Experimental Evidence of Adsorption as a Source of Planetary Water [#2087]*

Many Earth oceans of water could have been adsorbed onto grains in the accretion disk prior to the formation of the terrestrial planets.
Alexeev V. A.
Fossil Meteorites of Sweden: What are Their Cosmic-Ray Exposure Ages? [#1019]
It is highly probable that all meteorites found in Sweden have cosmic-ray exposure ages less than 2 Ma and that all these meteorites are fragments of one meteoroid.

Gorin V. D. Alexeev V. A. Kashkarov L. L. Ustinova G. K.
Pre-Atmospheric Sizes and Orbits of the Ash Creek and Tamdakht Chondrites According to the Results of Track and Cosmogenic Radionuclide Investigation [#1038]
The results of the track and cosmogenic radionuclide study in the fresh-fallen Ash Creek and Tamdakht chondrites are used in order to estimate the pre-atmospheric size and ablation as well as the most probable elements of orbits of the chondrites.

Hiltl M. Bauer F. Ernstson K. Mayer W. Neumair A. Rappenglück M. A.
SEM and TEM Analyses of Minerals Xifengite, Gupeiite, Fe2Si (Hapkeite?), Titanium Carbide (TiC) and Cubic Moissanite (SiC) from the Subsoil in the Alpine Foreland: Are they Cosmochemical? [#1391]
SEM and TEM analyses of millimeter- to centimeter-sized particles from Holocene soils reveal a multi-stoichiometric iron silicide matrix containing purest crystals of titanium carbide and cubic moissanite. A cosmochemical origin is suggested.

Lavrentjeva Z. A.
Olivine, Ca,Al-Rich Inclusions and Presolar Grains in the Enstatite Chondrites (EC): Clues to EC-Forming Region [#1055]
Oxidizing conditions must have played a role during early petrogenesis of the ECs. CAIs in ECs either formed in or were dispersed into regions distinct from CC and OC. The isotopic compositions of presolar grains in ECs are comparable with those of the supernova.

Miyamoto M. Kaiden H.
Evidence for Parent-Body Thermal-Metamorphism of CO3 Chondrite by Analyzing Fe-Mg Zoning of Olivine [#1156]
We studied whether thermal metamorphism of Y-791717 CO3.6 chondrite occurred in the parent body or in the primitive solar nebula by fitting the calculated Fe zoning of olivine to observed one. The result for the 600°–1000°C range shows the best fit.

Pack A. Horvath B. Hofmann M. Goldmann A. Albrecht N. Gellissen M. Zipf J. Palme H.
Defining the Terrestrial Oxygen Isotope Fractionation Line and Observed Oxygen Isotopic Heterogeneity Within the Allende Meteorite [#1827]
We show that the O isotope terrestrial fractionation line does not pass through the origin. Allende is isotopically heterogeneous (on 0.3 g scale) with no correlation with the chemical composition.

Rubin A. E.
CAIs, Dustballs and Refractory Lithophile Abundances in Chondrite Groups [#1016]
Porous centimeter-sized dustballs and millimeter-sized CAIs respond to aerodynamic forces in the same way and were concentrated in the same nebular regions. The CV-CK zone contained abundant dust and CAIs and acquired the highest amounts of refractory lithophiles.
A 2010 Taurid Bolide Imaged in the Framework of the Spanish Fireball Network [#1859]
A Taurid bolide as bright as the full Moon was imaged over Catalonia on October 19, 2010. The meteoroid dynamic strength in the main fragmentation was $1.9 \times 10^5$ dyn/cm$^2$, being more fragile than typical 2P/Encke meteoroids so no meteorites were produced.

Golubeva L. F. Shestopalov D. I.  
Space Weathering of Asteroids [#1029]
For high mobility of asteroid regoliths optical maturity of asteroid bodies is low and cannot substantially alter their reflectance spectra.

Granata V. Marzari F. Davis D. R. Paolicchi P. Vanzani V.  
Multi-Zone Simulations of the Collisional Evolution of Main Belt Asteroids [#1359]
We have adapted the planet building code, a multizone code, to study the collisional evolution of asteroids in the main belt. In this way the effects of resonances and Yarkowski’s drift are statistically included and we can estimate the flux of bodies into NEO orbits.

Illés-Almár E.  
Comet Hartley 2 and the Two Kinds of Cometary Sub-Nuclei [#1354]
The images of the nucleus of Comet Hartley 2 strengthen our earlier hypothesis that the subnuclei, building up the nucleus of a comet, can be of different hardness.

Katsura T. Nakamura A. M. Suzuki A. Hasegawa S.  
Impact Experiments on Collisional Evolution of Iron Regolith [#1695]
We show the surface of iron bodies may be covered with regolith based on impact experiments onto iron targets. We also show the crater morphology and cratering efficiency of iron particles are similar to those of rocky regolith.

Kochemasov G. G.  
Similar Shapes of Asteroid Eros, Satellite Atlas, and Comet Hartley 2 Despite of Different Classes, Orbits, Sizes and Compositions of These Bodies [#1125]
Small celestial bodies show similar oblong convexo-concave tectonically dichotomous shapes due to a warping action of inertia-gravity waves appearing in them because of their movements in Keplerian orbits with periodically changing accelerations.

Konovalova N. A. Madiedo J. M. Trigo-Rodriguez J. M.  
The Physical Properties of the June Bootids and the July 23, 2008 Superbolide [#1355]
The results of the physical properties of the June Bootids and superbolide of July 23, 2008, are presented. On the basis of the aerodynamic pressure we can conclude that the superbolide was sufficiently large and of high enough tensile strength to produce meteorites.

Krause M. Henke S. Gail H.-P. Trieloff M. Blum J. Skorov Yu. V. Schwarz W. H. Kleine T.  
Modeling the Early Thermal Evolution of Meteorite Parent Bodies Based on New Thermal Conductivity Measurements of Highly Porous Aggregates [#2696]
Peak central temperatures in initially highly porous planetesimals heated by short-lived nuclide decay energy are significantly higher particularly for small km sized planetesimals.

Madiedo J. M. Trigo-Rodriguez J. M.  
Historical Records of $\delta$-Arietids Superfireballs Over Spain [#1368]
We present the analysis of a very remarkable event that took place over Spain on December 8, 1932, and the evidence that supports its connection to the $\delta$-Arietids meteor shower. This supports the idea that this could be a meteorite-producing shower.
Shetopalov D. I. Golubeva L. F.
Bond Albedo of Asteroids from Polarimetric Data [#1028]
One can estimate the Bond albedo of asteroids by their maximal negative polarization.

Tricarico P. Samarasinha N.
A Model For Dust Particles Orbiting the Nuclei of Comets [#2721]
A model for dust particles orbiting the nuclei of comets is presented. The initial capabilities of the model are discussed.

Trigo-Rodríguez J. M. Llorca J. Madiedo J. M. Rivkin A. S. de León J. Pinilla-Alonso N.
Precise Reflectance Spectra of Ordinary Chondrites in the Visible and UV: Exploring the Variability of S-Class Asteroidal Spectra [#1795]
We used a UV-Vis-NIR spectrometer to get reflectance spectra of several ordinary chondrites. The results are compared with the averaged reflectance of S-class asteroids. We explore the importance of roughness in the diversity observed for the S-class.

DIFFERENTIATED METEORITES

Defouilloy C. Duhamel R. Robert F. Clog M.
Hydrogen Isotopic Ratio in Iron Meteorites [#1385]
We propose to better document the history of iron meteorites by measuring the isotopic ratio of the hydrogen they contain with a 3f ion microprobe. First results show that this hydrogen is likely coming from chondritic water.

Moggi-Cecchi V. Caporali S. Pratesi G.
Petrologic and Minerochemical Investigation of Acapulcoites, Winonaites and Lodranites: New Evidences from Image Analysis and EMPA Data [#1398]
Petrologic and minerochemical features of several primitive achondrites have been examined in order to determine significant parameters for genetic studies and classification purposes.

Szurgot M.
On the Specific Heat Capacity and Thermal Capacity of Meteorites [#1150]
Specific heat and thermal capacities of meteorites have been determined and analysed. Relationships between both heat capacities and bulk density of meteorites have been established.

Wasson J. T. Hoppe P.
Use of Co/Ni Ratios at Kamacite/Taenite Interfaces to Determine Relative Cooling Rates of Iron Meteorites [#2452]
The double ratio (Co/Ni) kamacite/(Co/Ni) taenite is temperature dependent; measuring this ratio offers information about relative cooling rates.

PLANETARY DYNAMICS AND TECTONICS

Futó P. Guesik A.
Coreless Earth-Mass Exomoon of an EGP [#1229]
Physical properties for a modeled moon: radius is about 7008 km (1.1 R_{Earth} with roughly 2% uncertainty) and continental lithospheric thickness is 114 km; surface gravity is 8.1 m/s^2, which is 82.5% of the Earth average value.

Schultz R. A.
The Influence of Near-Surface Stratigraphy on the Growth and Scaling of Normal Faults in Bishop Tuff, California, with Planetary Implications [#1471]
Changes in fault shape are due to stiffness changes in a stratigraphic sequence, rather than restriction. Non-restricted fault growth is indicated by linear D-L scaling regardless of shape.
**MERCURY**

Holin I. V.
*Core-Mantle Interplay from Spin Variation of Mercury’s Crust [#1018]*
Deep interior properties of Mercury in its transitional, partially solidified state are within reach of Earth-based radar.

Starukhina L. V.  Shkuratov Y. G.
*Reduced Iron Grains from Nano- to Micron Sizes in Lunar and Mercurian Regoliths: Calculation of Spectral Effects [#1144]*
Spectral effects of reduced iron grains from nano- to micrometer sizes were calculated for bright featureless powdered material and for lunar and mercurian regoliths. Calculations show dominance of submicrometer iron over nano-iron grains in Mercury spectra.

**MOON**

Baragiola R. A.  Dukes C. A.
*Surface Science Constraints to Regolith Models [#2477]*
We will discuss regolith processes: electrostatic charging, dust adhesion and levitation, Na diffusion, and water formation from implanted H. We will emphasize the need to ion bombard lunar simulants previous to laboratory studies of surface properties.

Bereznoy A. A.  Kozlova E. A.  Shangaraev A. A.  Shevchenko V. V.
*Stability and Origin of Lunar Polar Volatiles [#1185]*
All detected species except H2, CO, and CH4 are stable against evaporation at the LCROSS impact site. Cometary NH3, C2H4, CH3OH, and CH4 can survive during low-speed impacts while other detected species can be formed during impacts of O-rich comets.

Chen S. B.
*Geologic Investigation and Mapping of the Sinus Iridum Quadrangle from Clementine, SELENE, and Chang ‘E-1 [#1779]*
The objectives of lunar satellite remote sensing are to study lunar surface characteristics, inner structure, and its evolution history.

Du J. S.  Chen C.  Liang Q.  Zhou C.
*Lateral Density Variations on the Surface and in the Crust of the Moon [#1744]*
Firstly, we statistically model the density distributions on the Moon from petrologic mapping and densities of the rock samples. Secondly, the average lateral density variations in the lunar crust is modeled based on the topography and gravity field of the Moon.

Evans R.  Lena R.  Phillips J.  Wöhler C.
*Lunar Domes Near Menelaus Crater [#1485]*
We examine two possible effusive lunar domes bisected by linear rilles near Menelaus Crater in terms of their morphometric and inferred rheologic properties and feeder dike dimensions. The region along the rilles consists of olivine-rich mare basalt.

Fruland R. M.  Cooper B. L.  Gonzalez C. P.  McKay D. S.
*New Technology/Old Technology: Comparing Lunar Grain Size Distribution Data and Methods [#1587]*
Most lunar grain-size data has been generated by mechanical sieving, but new laser diffraction technology now generates reproducible grain-size distributions and reveals new structures not apparent in old sieve data.
Kaydash V.  Shkuratov Y.

**Phase-Ratio Imagery as a Tool to Study the Lunar Surface Structure: Example of Vallis Schröteri [1361]**

We apply the phase-ratio method using data from NAC LROC onboard the NASA LRO spacecraft with the aim to identify naturally altered regolith structure on the wall of Vallis Schröteri, the largest sinuous rille on the Moon.

Kozlova E. A.  Lazarev E. N.  Shangaraev A. A.

**“Cold Traps” and PSR Near South Pole of the Moon [2039]**

We investigated the distribution of the temperature and illumination in the South Pole region of the Moon with data obtained by LRO (LOLA) spacecraft.

Lena R.  Evans R.  Lammel S.  Phillips J.  Wöhler C.

**Effusive Lunar Domes in Capuanus Crater: Morphometry and Mode of Emplacement [1443]**

We describe three lunar mare domes on the floor of Capuanus crater in terms of their morphometric and inferred rheologic properties and feeder dike dimensions. Furthermore, we construct a petrographic map of the Capuanus region.

Liang Q.  Chen C.  Li Y.

**3-D Inversion of the Gravity Data on the Moon [1729]**

A new 3D inverse method for lunar gravity data was developed to investigate the density structure in crust and mantle of the Moon. The results showed that the lateral heterogeneities of density are mainly located at the depth above 50 km.

Lu Y.  Shevchenko V. V.

**Dry Debris Flow on the Moon: Chang’E-2 Data [1254]**

The presence of very young details and immature soils on the inner wall slopes of the crater Daniell suggests recent intensive slope processes.

Nazarov M. A.  Demidova S. I.  Brandstaetter F.  Ntaflos Th.

**Dhofar 301: Evidence for Strong Reduction in Lunar Highland Rocks [1228]**

An anorthositic clast containing Fe-free pyroxenes was found in the Dhofar 301 lunar feldspathic meteorite. The clast shows evidence for strong reduction and mobilization of Fe, Cr, and Mn as carbonyl compounds in the lunar environment.

Petrova N. K.  Hanada H.

**Simulating of Stellar Tracks for Observations by the Polar ILOM-Telescope [1179]**

The ILOM is an experiment to measure the lunar libration in situ on the Moon with a small telescope. The simulating revealed sensitivity to lunar dynamical models and the difference from daily parallels in comparison with ground-based observations.

Radhadevi P. V.  Nagasubramanian V.  Solanki S. S.  Krishna Sumanth T.  Saibaba J.  Varadan G.

**Rigorous Photogrammetric Processing of Chandrayaan-1 Terrain Mapping Camera (TMC) Images for Lunar Topographic Mapping [1384]**

This paper describes the method of generating digital elevation models (DEM) and ortho images of the lunar surface from high-resolution TMC stereo images of Chandrayaan-1 through a rigorous photogrammetric processing.

Shevchenko V. V.  Pinet P. C.  Chevrel S.  Daydou Y.  Lu Y.  Skobleva T. P.  Kvaratskhelia O. I.  Rosenberg C.

**The Current Avalanche Depositions in Lunar Crater Reiner: LRO Data [1161]**

Avalanching appears to be a major means of the current erosion on steep lunar slopes.
Sinitsyn M. P.
*Comet Hypothesis of Hydroxyl and Water Origin on the Moon According to the Results of LRO and LCROSS Spacecraft* [#1236]
According to new data obtained by LRO and LCROSS space missions, comet origin water deposits, perhaps, are present on the south pole of the Moon. In addition, some recent facts concerning confirmation of the cometary hypothesis of surface hydroxyl and water accumulation are given.

Slyuta E. N. Shilobreeva S. N. Kashkarov L. L. Kalinina G. V. Voropaev S. A.
*Amorphization Depth of Anorthite and Quartz in Dependence on H+ and He+ Ion Energy and Irradiation Dose* [#1127]
When irradiation dose by protons is high enough, all chemical and physical processes of space weathering of anorthite and quartz particles in lunar regolith will occur in the radiation-induced amorphous film, without reaching crystal lattice.

Slyuta E. N. Shilobreeva S. N. Voropaev S. A. Kashkarov L. L. Zinenko V. I. Saraykin V. V.
*Preliminary Experimental Data on Irradiation-Induced Fractionation of Isotopes 54Fe and 56Fe* [#1195]
The observed irradiation-induced fractionation of isotopes Fe is practically equal to the observed kinetic mass fractionation, but is opposite in sign.

*Phase Curve of Lunar Color Ratio* [#2060]
A phase curve of color ratio C (603/472 nm) of the Moon has been obtained and compared with data of other authors. A minimum of the phase curves at small phase angles is not regularly observed. This contradicts the coherent backscatter effect.

---

**IMPACTS**

Povenmire H. Harris R. S. Cornec J. H.
*The New Central American Tektite Strewn Field* [#1224]
Recently there have been more than 40 tektites found in western Belize. This apparently represents part of a new tektite strewn field. The Pantasma crater in Nicaragua is about 14 km diameter and is currently being investigated as the possible source crater.

Svetsov V. V.
*Simulation of Early Martian Atmosphere Controlled by Impacts* [#1137]
The model of atmosphere evolution during late accretion of asteroids and comets (Zahnle, *JGR*, 1993) with impactor and target vaporization is applied to an early Mars, using impact erosion and retention coefficients calculated by Shuvalov (*M&PS*, 2009).

Takasawa S. Nakamura A. M. Sangen K.
*Target Size Dependence of Disruption Threshold: Collisional Fragmentation Experiments of Millimeter Scale Rocks* [#1155]
We conducted collisional disruption experiments of pyrophyllite targets of size between 1.6 and 32.8 mm. The catastrophic disruption threshold (Q*) is shown to increase with decreasing target size with a single power law down to about 1 mm.

Valter A.
*Shock-Induced Twinning of K-Spars Crystals — The Remarkable Feature of Glass-Poor Suevites of Zeleny Gay Astrobleme, Ukraine* [#1158]
The shock twins of microcline from the suevite-poor breccia of a small ancient impact crater from Ukrainian shield was investigated. The genesis of this rare phenomena was connected with the ricochet nature of impact.
Vishnevsky S. A.  
**Popigai Astrobleme (Russia): Water and Diamond Potential of Impactites-Tagamites** [#1666] 
A role of water in preserving/changing the impact diamond potential in the Popigai impactites-tagamites is discussed.

Weatherington P. H.  King D. T. Jr.  
**Ocmulgee Structure, Georgia (USA): Searching for Evidence of Impact** [#2356] 
The Ocmulgee structure of south-central Georgia is a subtle domal feature that is surrounded by the arcs of two major rivers, the Ocmulgee and Oconee. This paper is a progress report on outcrop work looking for any shocked materials in that area.

---

**IGNEOUS PROCESSES**

**Sulfides from Martian and Lunar Basalts: Comparative Chemistry for Ni, Co, Cu, and Se. Range of Point Analyses Per Sample** [#1008] 
We examine sulfides from martian and lunar basalts, comparing their trace element characteristics to determine differences and similarities between grains from the two planetary bodies.

---

**MARS**

Centeno J. D.  de Pablo M. A.  
**Possible Evidences of Ice Dynamics in the Putative Glaciers at the Lower NW Flank of Hecates Tholus Volcano, Mars** [#1031] 
Glacial forms, like crevasses and bergschrunds give evidence of recent glacial flow in the northwest flank of Hecates Tholus. We show several working hypothesis on the origin of these forms and its relation with slope gravitational processes and deglaciation.

Chuang F. C.  
**Point Pattern Analysis of Intracrater Deposits in Western Arabia Terra, Mars** [#1468] 
R and K statistical tests were applied to intracrater layered deposits in western Arabia Terra, Mars. Results showed that deposits are clustered with the K test having two distinct clustered masses. Future work will involve spatial autocorrelation.

Clarke J. D. A.  Stoker C. R.  
**Mars Analog Significance of Concretions in Exhumed and Inverted Channels Near Hanksville, Utah** [#1611] 
The landscape of Hanksville, Utah, has inverted anastomosing paleochannels exhumed from the Late Jurassic Morrison Formation. The paleochannels host carbonate concretions. Both channels and the concretions are analogs to martian features.

Coleman N. M.  
**Phaenna Dorsum, An Esker on Mars: Insights from THEMIS and HiRISE Images and MOLA Data** [#1906] 
Phaenna Dorsum is an esker-like ridge in S. Argyre Planitia. Two MOLA passes that cross the ridge at right angles reveal it has a height of 110 m and a basal width of ~8 km. Thermal inertias inferred from THEMIS support the view that the ridge is an esker.

**Meteorites at Meridiani Planum Indicate Extensive Surface Water on Early Mars** [#2088] 
The four Fe-Ni meteorites discovered in Meridiani impacted into a soft and wet target sometime during the Noachian or the Hesperian; they were subsequently encased underground, to be ultimately exposed at the surface through differential erosion.
Hays N. R.  Drake M. J.  Gehrels G. G.
U-Th-Pb Analysis of Baddeleyites in Shergottite Meteorites [#1243]
In situ LA-MC-ICP-MS analysis of U-Pb systematics in baddeleyite grains from NWA 2986 and RBT 04262 returned maximum ages of $187 \pm 50$ to $1236 \pm 430$ respectively. These results are consistent with previous analyses and imply young crystallization.

He Q.  Hsu W.  Xiao L.  Guan Y.
Petrography and Geochemistry of the Shergottite Northwest Africa 2975 [#1646]
NWA 2975 is an enriched basaltic shergottite. We report the major and trace element concentrations of individual minerals in NWA 2975, combining with oxybarometry to provide new insights into martian differentiation history.

Kraal E. R.
Evolving Interpretations of the Eberswalde Deposit [#2302]
Given the importance for martian surficial and climate history, as well as proximity to a possible MSL landing site, this abstract argues for a reconsideration of the Eberswalde deposit in light of new data and possible conflicting interpretations of various research groups.

Lee C. B.  Park S. J.
Observations of Phyllosilicate Bearing Deposits in Mawrth Vallis and Nili Fossae: Stratigraphy and Possible Formation Scenarios [#1768]
In this paper, we suggest that deposition of clay minerals in a large fluvial-lacustrine or marine environment contributed to the stratigraphic development of phyllosilicates in Mawrth Vallis and Nili Fossae.

Machado A.  Barata T.  Saraiva J.  Lira C.  Pina P.  Alves I.  Mora C.  Vieira G.
Characterization of the Martian Hummocky Terrains Based on Analogues from Earth [#1994]
The present work aims to identify hummocks and putative mud boils on martian hummocky terrains based on Earth analogues from Adventdalen Valley, Longyearbean, Spitsbergen Island, Svalbard.

Calibration of the Quadrupole Mass Spectrometer of the Sample Analysis at Mars Instrument Suite [#1556]
The calibration of the Quadrupole Mass Spectrometer of the Sample Analysis at Mars (SAM) Instrument Suite is described with a focus on the four major martian atmospheric constituents. A detector dead time correction method is presented.

Neather A. C.  Lane S.  Wilson L.
The Surface Expression of the Arsia-Mangala Dike, Mars, is Controlled by the “Sawtooth” Profile of Surface Topography [#1380]
We show how surface topography controls three close approaches to the surface by the dike that formed the Mangala Fossa graben as the dike propagated laterally from the Arsia Mons mantle plume.

Shean D. E.  Fahle J.  Malin M. C.  Edwards L. J.  Posiolova L.
MRO CTX Stereo Image Processing and Preliminary DEM Quality Assessment [#2646]
We describe ongoing efforts to process and characterize the quality and accuracy of MRO CTX anaglyphs and digital elevation models (DEMs).

de Pablo M. A.  Centeno J. D.
New Observations of Glacial Features on the Lower NW Flank of Hecates Tholus Volcano (Mars) Based on CTX and HiRISE Images [#1030]
HiRISE and CTX images of the NW flank of Hecates Tholus volcano, Mars, show abundant evidence of a present or recent glacier: crevasses, morainas, eskers, etc. Here we made an inventory of all these features and a general interpretation of their origin.
**EXOBIOLOGY**

Caporali S. Moggi-Cecchi V. Muniz-Miranda M. Pagliai M. Pratesi G. Schettino V.

*Surface-Enhanced Raman Micro-Spectroscopy of Adenine Adsorbed on Martian Meteorite as a Test for a Search of Extraterrestrial Life Traces [#1401]*

We report the results of a SERS investigation on DAG 670 meteorite (martian shergottite), on which adenine has been deposited. Different mineralogical phases were investigated, providing evidence of the SERS capability to detect traces of nucleobases.

Dohm J. M.

*Inventory of Potentially Habitable Environments on Mars [#2234]*

Inventory of potentially habitable environments based on direct linkage among life on Earth and specific environmental conditions are presented at the conference.


*REMS (MSL Meteorological Station) Methodology Tested in Earth Analogs [#2598]*


Ivarsson M. Swillo M. Neubeck A. Holm N. G. Broman C. Björk G.

*High Precision Drilling and Extraction of Micro-Sized Material in Geologic Samples: Implications for Astrobiology [#1372]*

Here we demonstrate a method to drill in geological material using high-precision laser ablation and extract micrometer-sized samples for further analyses.

**PLANETARY ATMOSPHERES**

Madhusudhan N. Mousis O. Lunine J. Johnson T.

*Carbon-Rich Giant Planets: Atmospheric Chemistry, Thermal Inversions, and Formation Conditions [#2760]*

Carbon-rich planets form an exotic new class of extrasolar planets with the recent discovery of a carbon-rich atmosphere in WASP-12b. We report a detailed study of atmospheric chemistry, temperature structure, and formation of such planets.

Molina A. de Pablo M. A. Ramos M.

*Implications of MER Mini-TES Surficial and Atmospheric Temperatures Evolution During a Year on Gusev Crater, Mars [#1116]*

We studied the Spirit MER Mini-TES temperatures, from different azimuths, in order to take surficial and atmospheric values. A complete serial of a martian year, allow us to interpret some interesting issues about local climate and surface characteristics.

Shalygina O. S. Shalygin E. V. Korokhin V. V. Velikodsky Yu. I.

*Appearance of Linear Polarization at Polar Regions of Jupiter [#2788]*

The mechanism of polarization appearance at zero orbital phase angle in polar regions of Jupiter was proposed. Modeling using Monte-Carlo code and preliminary studying of influence the form of aerosol were done.
OUTER SOLAR SYSTEM SATELLITES AND RINGS

Hirata N. H. Miyamoto H. M.

Unusual Smoothness of the Surface of a Saturnian Icy Satellite, Atlas

Atlas, a small saturnian satellite, has an extremely smooth surface. From geological and theoretical investigations, we propose dust levitation might be active at a global-scale as a major resurfacing process on the surface of Atlas.

Mousis O. Lunine J. I. Picaud S. Cordier D.

The Role of Clathrate Hydrates in Cleaning the Noble Gases of Titan’s Atmosphere

We show that Ar, Kr, and Xe can be trapped efficiently in a clathrate layer in contact with the atmosphere of Titan. This mechanism could explain in a consistent way the apparent deficiency of noble gases measured in Titan’s atmosphere.

Perov N. I. Kondratieva A. V.

On the Model of Motion of Giant Planets Rings Arcs

Perturbed four body (a planets, two satellites of equal mass and a particle) central configuration is under consideration. For ratio of mass of planets M and satellites m M/m>1150 the stable arcs of rings are formed near the planets.

Schmude R. W. Jr.

Drift Rates and Latitudes of Jovian Currents

The purpose of this paper is threefold: to report the distribution of drift rates and latitudes of currents on Jupiter between 1990 and 2010; to compare these to earlier results; and to establish drift rates and latitudes for currents not well established in earlier studies.

MISSIONS, INSTRUMENTS, AND PAYLOAD CONCEPTS

Anderson F. S. Nowicki K.

An Initial Demonstration of LDRIMS on the Boulder Creek Granite: Implications for In-Situ Geochronology

We discuss an initial low-precision geochronology measurement of the Boulder Creek Granite using a miniaturizable laser desorption resonance ionization mass spectrometer with applications for in situ dating on the Moon and Mars.

Goswami J. N. Annadurai M.

Chandrayaan-2 Mission

Chandrayaan-2 with an orbiter-lander-rover configuration is an Indo-Russian collaborative mission to be launched in 2013. Observations in X-ray, VIR, and microwave from the orbiter and in situ studies of a high-latitude location by the lander and rover are planned.

Hörz F. Evans C. Eppler D. Gernhardt M. Bluethmann W. Graf J. Bleisath S. DRATS Science Team

Crew Field Notes: A New Tool for Planetary Surface Exploration

The DRATS 2010 field simulation introduced concise verbal summaries by the crews and supporting imagery of important geologic features and samples that were electronically tagged as the highest priority science data, amenable to rapid downloading.

Kereszturi A.

Extrapolation of Shallow Subsurface Structures from Orbital Data — Case Study for ExoMars Rover Mission

This paper presents the basis of the methods for how the location and parameters of subsurface features accessible by the drill sampling equipment of ExoMars Rover could be estimated from remote sensing data.
The Chandrayaan-2 Large Area Soft X-Ray Spectrometer (CLASS) [#1708]
CLASS on Chandrayaan-2 aims to map the abundance of elements on the lunar surface using XRF during solar flare. The instrument uses large area SCDs and is designed to provide better spatial resolution and sensitivity than the C1XS experiment on Chandrayaan-1.

Knowledge of the interior and evolution of the Moon, and by extension, other terrestrial planetary bodies, will be greatly advanced by the Gravity Recovery And Interior Laboratory (GRAIL) mission, which is on track for launch in September 2011.

DATA TOOLS, ACCESS, AND ARCHIVING

Hare T. M. Skinner J. A. Jr. Fortezzo C. M. Bailen M. S.
FGDC Geospatial Metadata for the Planetary Domain [#2154]
Due to their uniqueness and variety, planetary metadata has never been synchronized with the widely available Federal Geographic Data Consortium standards. We describe the benefits of FGDC standards for geospatial data within the planetary domain.

Schorghofer N.
GPU-Accelerated Thermal Model for Planetary Surfaces [#1616]
Graphics Processing Units (GPUs) can be used as numerical coprocessors. A thermal model of planetary surfaces is ported to a GPU and leads to a speedup of one and a half orders of magnitude.

EDUCATION AND PUBLIC OUTREACH

Bérczi Sz. Hargitai H. Homolya E. Illés E. Kereszturi A. Mörtl M. Sik A. Tasnádi P. Weidinger T.
The new Solar System Liquids atlas deals with (1) cloud droplets and cloud formation processes in planetary atmospheres; (2) liquids on planetary surfaces and below surfaces; (3) liquids deep inside planetary bodies and eruptions to surfaces.

Bérczi Zs. Bérczi Sz. Terebessy T.
Planetary Geology Education on the Stage: Dynamics of Planetary Morphology in Theatre Performance [#1348]
The Living Picture Company planned and produced a performance, where planetary surface dynamics were realized and planetary morphology processes were animated, both of which are useful in planetary morphology education.

Carter J. A. Vickers M. J.
The Aberystwyth Physics Buskers: An Ongoing Public Outreach Scheme [#1731]
We describe a public science outreach scheme set up and run by postgraduate students in Aberystwyth University. Outlined are the scheme’s effects on local views of science, the reception by local schools, and on the personal development of the scheme participants.

Clark C. S.
Foldable Boundary-Based World Maps of Geologies of Enceladus and Ganymede [#2809]
Constant-scale natural boundary world maps comparing two tidally-locked icy moons.
PROGRAM AUTHOR INDEX

* Denotes speaker

>29,000 Stardust@home Dusters
Abbey W. J.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Abbey W. J.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Abdrakhimov A. M.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Abe M.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Abe M.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Abe M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Abe Y.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Abe Y. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Abdel N. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Abel R. L.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Abel L.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Abercromby A. F.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Abraham P.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Abramov O. * Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Abreu N. A. * Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Abreu N. M.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Acharya Y. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Achilles C. N.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Achterberg R.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Acosta T. E.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Adamek N.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Adams K. A.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Adams R. D.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Adcock C. T.  Materials Analogs Posters, Thu, p.m., Town Center Exhibit Area
Aden D. J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Agee C. B.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Agee C. B.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Agee C. B.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Agresti D. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Agresti D. G.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Aharonson O.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Aharonson O.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Aharonson O.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
A’Hearn M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
A’Hearn M. F.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
A’Hearn M. F. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
A’Hearn M. F. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Ahmed M.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Ahmed M.  Cosmochemical Origins I Posters, Thu, p.m., Town Center Exhibit Area
Ahn I.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Ahn I. S.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Aigouy T.  Venus, Wed, p.m., Montgomery Ballroom
Ajai  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Ajai  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Akins S. W.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Akram W. M. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Albarède F.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Albin E. F. M.  EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Albrecht N.  Print Only: Cosmochemistry Print Only
Aldridge T.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Aldridge T. M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Aldridge T. M.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Aleksandrov A. B.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Aleon J.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Alexander C.
Alexander C. M. O’D.
Alexander C. M. O’D.
Alexander C. M. O’D.
Alexander C. M. O’D.
Alexander C. M. O’D. *
Alexeev V. A.
Ali A.
Ali K.
Alkalai L.
Allan C.
Allie P.
Allie P.
Allen C.
Allen C.
Allen C.
Allen C.
Allen C.
Allen C.
Allen C.
Allen C.
Allen J.
Allen J.
Allen J.
Alfred C.
Allston J. H.
Allston J. H.
Allwood A. C.
Alp E. E.
Alsmadi A.
Altvie K.
Alves E. I.
Alves I.
Alvmark C.
Amara S.
Amari S.
Amari S.
AMASE 2010 Team
AMASE 2010 Team
AMASE Team
Amaya G. L.
Ambrose W. A.
Ambrosi R. M.
Amelin Y. *
Amelin Y.
Amelin Y.
Ames D. E.
Amitabah
Ammannito E.
Ammannito E.
Amundsen H.
Amundsen H.
Amundsen H. E. F. *
Amundson H. E. F.
Anand M.
Anand M.
Anbazhagan S.
Anders D.
Anders D. T.
Anderson B. J.
Anderson B. J.

Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Print Only: Cosmochemistry
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Education and Public Outreach, Tue, p.m., Montgomery Ballroom
EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Print Only: Mars
The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Achondrites, Mon, p.m., Waterway Ballroom 4
Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Thermal and Magmaic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Mercury, Mon, p.m., Waterway Ballroom 1
Mercury Posters, Tue, p.m., Town Center Exhibit Area
Anderson D.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Anderson F. S.  Print Only: Missions, Instruments, and Payload Concepts
Anderson L. D.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Anderson R. B.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Anderson R. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Anderson R. C.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Anderson R. C.  Print Only: Mars
Anderson S.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Andreoli M. A. G.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Andrews-Hanna J.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Andrews-Hanna J. C.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Andrews-Hanna J. C.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Andrews-Hanna J. C.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Andrews-Hanna J. C.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Andrews-Hanna J. C.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Angrilli F.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Annadurai M.  Print Only: Missions, Instruments, and Payload Concepts
Annex A. M.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Ansan V.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Ansar A.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Antonenko I.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Antonenko I.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Antonsen J.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Apai D.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Arai T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Arai T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Arakawa M.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Arakawa M.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Araki H.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Araki H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Araya A. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Archinal B.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Archinal B.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Archinal B. A.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Archinal B. A.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Archinal B. A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Ardia P.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Arevalo R. D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Arif Md.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Arivazhagan S.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Arkani-Hamed J.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Arkani-Hamed J.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Armiens-Aparicio C.  Print Only: Exobiology
Armitage P. J.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Armstrong J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Arnold J. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Arnold K.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Artemieva N.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Arvidson R. E.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Arvidson R. E.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Arvidson R. E.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Arvidson R. E.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Arvidson R. E.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Arya A. S.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Asada N.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Ash R.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Ash R. D.  Achondrites, Mon, p.m., Waterway Ballroom 4
Ash R. D.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Ash R. D.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Ash R. D.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Ashley G. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ashley J.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Ashley J. W.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Ashley J. W. * Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Ashley J. W.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Asmar S. W.  Print Only: Missions, Instruments, and Payload Concepts
Asphaug E.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Asphaug E.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Asphaug E.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Asphaug E.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Asphaug E. * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Asphaug E. I.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
ASTERIA Team  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Athena Science and CRISM Teams  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Athena Science Team  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Athiray P. S.  Print Only: Missions, Instruments, and Payload Concepts
Atkins C. M.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Attreye P.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Attreye S. K.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Audet P.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Austin D. E.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Aveline D. C.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Avidon J. A.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Aye K.-M. * Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom I
Aye K-M.  Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1
Azuma S.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Babin F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Backes P.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Badjukov D. D.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Baegi M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Baer A. T.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Bailen M. S.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Bailen M. S.  Print Only: Data Tools, Access, and Archiving
Baines K. H.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Baines K. H.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Baines K. H.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Bajo K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Bajt S.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bajt S.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Baker D. M. H. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Baker D. M. H.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Baker L. L.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Baker M.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Baker V. R.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Baker V. R.  Print Only: Mars
Balaji G.  Print Only: Missions, Instruments, and Payload Concepts
Balcerski J.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Balcerski J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Balcerski J. A. * Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Baldrige A. M.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Baldrige A. M.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Baldrige A. M.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Balme M.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Balme M. R.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Balme M. R.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Balta J. B.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Balta J. B. * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Bampasidis G.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Banaszkiewicz M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bandeira L.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Bandea L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Bandea L.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Bandfield J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandfield J. L.</td>
<td>Mars Alteration, Wed, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandfield J. L.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandfield J. L.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandfield J. L. *</td>
<td>Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banerdt W. B.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banerjee N. R.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banerjee N. R.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banfield D.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banfield D.</td>
<td>Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks M. E.</td>
<td>Mercury, Mon, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks M. E.</td>
<td>Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks M. E.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banks M. S.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baragiola R. A.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baragiola R. A.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baragiola R. A.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baragiola R. A.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barata M. T.</td>
<td>Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barata M. T.</td>
<td>Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barata T.</td>
<td>Print Only: Mars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baratoux D.</td>
<td>Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baratoux D.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbara J. M.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barber B.</td>
<td>Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbieri C.</td>
<td>Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barefield J. E.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barfoot T.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barge L. M.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barker D.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barker I. R.</td>
<td>Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlow N. G.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlow N. G.</td>
<td>Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlow N. G.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barlow N. G.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnes J. W.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnes J. W.</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnhart C. J.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnie T. D.</td>
<td>Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O.</td>
<td>Lunar Impacts II, Fri, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S. *</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barnouin O. S.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barr A. C.</td>
<td>Mini-Mimas, Thu, p.m., Montgomery Ballroom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barr A. C.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barr A. C.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barr A. C. *</td>
<td>Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barracough B. L.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrat J. A. *</td>
<td>Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrat J.-A.</td>
<td>Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrat J.-A.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barreiro F.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrett J. M.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bart G. D.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bartels A.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barthelemy M.</td>
<td>Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bartoschewitz R.</td>
<td>Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Barucci A.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Barucci M. A.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Baryshev S. V.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Baryshev S. V.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Basavaiah N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Basilevsky A. T.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Basilevsky A. T.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Basilevsky A. T.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Basilevsky A. T. * Venus, Wed, p.m., Montgomery Ballroom
Baskin P. J.  Environmental Analogues Posters, Tue, p.m., Town Center Exhibit Area
Bassis J. N.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Battler M.  Environmental Analogues Posters, Tue, p.m., Town Center Exhibit Area
Battler M. M. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Bauch K. E.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Bauch K. E.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Bauch K. E.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Bauer A. W.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bates D. E.  Materials Analogues Posters, Tue, p.m., Town Center Exhibit Area
Bates D. E.  Instrument and Payload Concept Posters, Thu, p.m., Town Center Exhibit Area
Bauch K. E.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Bauch K. E.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Bauch K. E.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Bauch K. E.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Bauer F.  Print Only: Cosmochemistry Print Only
Bauer J. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Bauer J. M.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Bauer J. M.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Bauer J. M.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Baumeister J.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Baur H.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Baur H.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Baur H.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Baur H.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Beal R. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Beal R. A.  Materials Analogues Posters, Tue, p.m., Town Center Exhibit Area
Beaman B.  Instrument and Payload Concept Posters, Thu, p.m., Town Center Exhibit Area
Beane R. J.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Beatty S. M.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Beauchamp M.  Environmental Analogues Posters, Tue, p.m., Town Center Exhibit Area
Beauford R. E.  EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Beaumont S.  Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area
Bebout G. E.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Becerra P. * Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1
Bechtel H. A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bechtel H. A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Beck A. W.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Beck A. W. * Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Beck C.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Beck P. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Beck P.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Beck P.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Beck P.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Beck P. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Becker H. * Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Becker H. Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Becker K.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Becker S. K.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Becker T. E.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Becker T. L.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Beckett J. R.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Beckett J. R. Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Beckett J. R. * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Beckett J. R. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Beddingfield C. B.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Beddingfield C. B.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Bedini P. D.  Mercury, Mon, p.m., Waterway Ballroom 1
Bednarz S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Beegle L. W.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Beegle L. W.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Beegle L. W.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Beggan C. D.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Begley S. B.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Beisser K.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Bell D. R.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Bell E. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Bell J. III  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Bell J. F.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Bell J. F. III  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Bell J. F. III  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Bell J. F. III  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Bell J. F. III  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Bell J. F. III  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Bell M. S.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Bell S.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Bell S. W.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Bellerose J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Bellutta P.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Belton M. J. S.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Belton M. J. S. *  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Benavide P. G.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Bendel V.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Bendel V. *  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Bender S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Bender S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Benedix G.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Benedix G. K.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Benedix G. K.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Benfield M. P. J.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Bennett E.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Bennett K.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Bennett K. J.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Benning L.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Benning L.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Benz W.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Berard G. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Berard G. M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Berard C.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Bérczi Sz.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Bérczi Sz.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Bérczi Sz.  EPO Undergraduate Education Posters, Tue, p.m., Town Center Exhibit Area
Bérczi Sz.  EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Bérczi Sz.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Bérczi Sz.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Bérczi Sz.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bérczi Sz.  Print Only: Education and Public Outreach
Bérczi Zs.  Print Only: Education and Public Outreach
Berezhnoy A. A.  Print Only: Moon
Berg T.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Berger A. J.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Berger E. L. *  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Berger G. *  Venus, Wed, p.m., Montgomery Ballroom
Berger G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Berger J. A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Poster Title</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berger J. A.</td>
<td>Mars Instruments Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berget D.</td>
<td>Mars Alteration Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bergin E. A.</td>
<td>Cosmochemical Origins I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berlin J.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berman D. C.</td>
<td>Special Session: Cryospheres I</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Berman D. C.</td>
<td>Mars: Large Volcanos and Flows Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berman D. C.</td>
<td>Martian Impact Crater Statistics Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berman D. C.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bernard S.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Bernatowicz T. J.</td>
<td>Unraveling the Origins of Presolar Grains</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Bernhardt B.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bertaux J. L.</td>
<td>Atmospheres: Observations and Processes Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Berthe M.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Besse S.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Besse S.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Besserer J.</td>
<td>Special Session: Cryospheres I</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Beuthe M.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R.</td>
<td>Planetay Mission Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R.</td>
<td>Mini-Mimas</td>
<td>Thu</td>
<td>p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Beyer R.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R. A.</td>
<td>Data Tools, Access, and Archiving Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R. A.</td>
<td>Mars Alteration</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Beyer R. A.</td>
<td>Martian Fanclub Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R. A.</td>
<td>The Medusae Fossae Formation Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Beyer R. A.</td>
<td>Moon Datasets Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bezaeva N. S.</td>
<td>Impact Experiments</td>
<td>Wed</td>
<td>a.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Bharti R.</td>
<td>Organics and Volatiles in Chondritic Meteorites Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bhatt M.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bhatt M.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Bhattacharya S.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bhattacharya S.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Bhavsar P.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bibring J. P.</td>
<td>Atmospheres: Observations and Processes Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bibring J. P.</td>
<td>Mars Alteration</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Bibring J. P.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bibring J. P.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bibring J. P.</td>
<td>From Mantle to Crust</td>
<td>Fri</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Bierhaus E. B.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bierhaus E. B.</td>
<td>Mini-Mimas</td>
<td>Thu</td>
<td>p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Bierhaus M. *</td>
<td>Planetary Dynamics and Tectonics</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Bierwirth M.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bigolski J. N.</td>
<td>Impacts II Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bills B. G.</td>
<td>Mercury</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Bills B. G. *</td>
<td>Planetary Dynamics and Tectonics</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Bills B. G.</td>
<td>Mini-Mimas</td>
<td>Thu</td>
<td>p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Bills B. G.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bills B. G.</td>
<td>Planetary Dynamics and Tectonics</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bindi L.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Binnie S. A.</td>
<td>The Dust Bin Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Binzel R. P.</td>
<td>Small Bodies</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Binzel R. P.</td>
<td>Asteroid Geophysics and Processes</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Binzel R. P.</td>
<td>Asteroid Studies Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Birlan M.</td>
<td>Asteroid Studies Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Birnie C.</td>
<td>Planetary Dynamics and Tectonics</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Bish D.</td>
<td>Carbon on Mars</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
</tbody>
</table>
Bish D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bish D. L.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Bish D. L.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Bish D. L.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Bishop J. L.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Bishop J. L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Bishop J. L. * Mars Alteration, Wed, p.m., Waterway Ballroom 1
Bishop J. L.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Bishop J. L.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Bishop J. L.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Bizzarro M. Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Bjella K. L. Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Björk G. Print Only: Exobiology
Black B. A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Blackburn D. G.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Blackburn D. G.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Blackburn D. G. * Mini-Mimas, Thu, p.m., Montgomery Ballroom
Blackburn D. G.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Blacksberg J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Blair D. M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Blair D. M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Blake D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Blake D. F. * Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Blake D. F.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Blake D. F.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Blake D. F.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Blake G. A. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Blake J. B. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Blanchette-Guertin J.-F. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Blanchette-Guertin J.-F. Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Blanco A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Blund M. T.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Blund M. T.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Blund M. T. * Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Blund P. A.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Blund P. A.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Bluney D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Blank J. G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Blankenship D. D.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Blankenship D. D. Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Blauvelt E. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Bleacher J. E. Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Bleacher J. E. EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Bleacher J. E. Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Bleacher J. E. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Bleacher J. E. Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Bleacher J. E. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Bleacher J. E. Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Bleacher L. V. Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Bleacher L. V. EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Bleamaster L. F. Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Bleamaster L. F. III Venus Posters, Tue, p.m., Town Center Exhibit Area
Bleamaster L. F. III Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Bleisath S. Print Only: Missions, Instruments, and Payload Concepts
Blewett D. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Blewett D. T. Mercury, Mon, p.m., Waterway Ballroom 1
Blewett D. T. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Blewett D. T. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Blöcher-Toft J. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Blinova A. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Blome H.-J. Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Bloom R. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Bluethmann W.  Print Only: Missions, Instruments, and Payload Concepts
Bluethmann W. J.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Blum J.  Print Only: Small Bodies
Blumers M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Boardman J.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Boardman J.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Boardman J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Boardman J.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Boardman J. W.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Boardman J. W.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Boctor N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Bodewits D.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Bodewits D.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Bodewits D.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Bodnar R. J.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Bodnarik J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Boehn E.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Boehnhardt H.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Boehnhke P.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Boesen J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Boesenberg J. S.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Boettcher S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Boettger U.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Borg L. E.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Bouchet R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Bouley S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Boonstra D.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Borg J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Borg J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Borg L. E.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Borg L. E.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Borisovsky S. E.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Bose M.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Bose M.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Boss A. P.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Bost N.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Bost N.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Bottke B.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Bottke W. F.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Bottke W. F.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Bouchet R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Bouley S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Bourdon B.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Bourdon B.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Bourgeois O.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Bourgeois O.  Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Bourke M. C. * Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Bourot-Denise M. Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Bourot-Denise M. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Bourot-Denise M. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Bouvier A. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Bouvier A. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Bowden R. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Bowers L. M. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Bowles N. E. Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Bowman J. R. Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Boyce A. J. Exobiology II, Thu, a.m., Waterway Ballroom 1
Boyce J. Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Boyd A. Moon Datasets Posters, Thu, a.m., Town Center Exhibit Area
Boyd A. K. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Bradley A. T. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bradley J. P. Print Only: Interplanetary and Presolar Dust
Braithwaite N. St. J. Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Bramall N. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Branson A. M. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Brand B. D. Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Brandenburg J. E. Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Brandon A. D. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Brandon A. D. Lunar Crust Samples Posters, Thu, p.m., Town Center Exhibit Area
Brandon A. D. Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Brandstaetter F. Print Only: Moon
Braun S. A. Lunar Crust Samples Posters, Thu, p.m., Town Center Exhibit Area
Braun S. A. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Bray V. Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Bray V. J. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Brearley A. J. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Brearley A. J. Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Brearley A. J. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Brearley A. J. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Brearley A. J. * Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Brecht S. H. Atmospheres: Observations and Processes Posters, Thu, p.m., Town Center Exhibit Area
Brenkert F. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Brenkert F. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Brenkert F. E. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Brenkert F. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Brennacka G. A. Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Brennacka G. A. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Brettschneider T. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Brian G. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Bridge N. J. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Bridges J. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bridges J. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Bridges J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bridges J. C. Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Bridges J. C. * Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bridges J. C. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bridges J. C. From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Bridges N.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Bridges N. T.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Bridges N. T.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Bridges N. T.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Bridges N. T.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Brigham D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Brigham-Grette J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Brinckerhoff W. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Brinkmeier F.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Brissenden G.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Bristow T.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Bristow T. F.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Brick M. A.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Brown A. J.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Brown A. J.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Brown E. B.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Brown E. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Brown J. M.  Coldmember:  Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Brown R. H.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Brown R. H.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Brown S.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Brown S. M.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Brownlee D.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Brownlee D. E.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Brownlee D. E.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Brownlee D. E.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Brownlee D. E.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Broxton M.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Bryden G.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Bryson C. E.  Exobiology I, Thu, p.m., Waterway Ballroom 1
Bryson K.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Bryukhovetskiy A. B.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Bualat M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Bualat M. G.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Buch A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Buchanan P. C.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Buchanan P. C.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Buchner E.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Buckingham D. T. W.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Buckingham L. K.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Buczkowski D. L.  Mercury, Mon, p.m., Waterway Ballroom 1
Buczkowski D. L.*  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Buczkowski D. L.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Buczowski D. L.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Buczowski D. L.  Mars Geomorphology:  Fluvial, Fri, a.m., Waterway Ballroom 1
Budney C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Budney C. J.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Bue B.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Bug M.  Print Only: Missions, Instruments, and Payload Concepts
Bugiel S.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Bugiolacchi R.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Bugiolacchi R. * Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Buikin A. I.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Bullock E. S. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Bullock M. A.  Venus, Wed, p.m., Montgomery Ballroom
Bullock M. A.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Bunch T. E.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Bunch T. E.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Bunch T. E.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Bunch T. E.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Bunch T. E.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Bunch T. E.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Bunte M.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Bunte M. K.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Buratti B.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Buratti B. J.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Buratti B. J.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Buratti B. J. * Mini-Mimas, Thu, p.m., Montgomery Ballroom
Buratti B. J.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Buratti B. J.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Burkine T. H. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Burkine T. H.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Burchell M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Burchell M.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Burchell M. J.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Burchell M. J. * Impact Experiments, Wed, a.m., Montgomery Ballroom
Burchell M. J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Burchell M. J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Burchell M. J.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Burchell M. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Burger D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Burger P. V.  Print Only: Igneous Processes
Burger P. V.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Burger P. V.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Burger P. V.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Burger P. V.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Burgt P.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Burgess R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Burgess R.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Burgess S.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Burghammer M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Burghammer M.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Burkemper L. K. * Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Burkett P. J.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Burkhardt C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Burkhardt C. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Burnett D. S.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Burnett D. S.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Burnett D. S.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Burnett D. S.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Burns K. J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Burri D. M.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Burri D. M.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Burri D. M.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Burri D. M.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Burton A. S. * Exobiology II, Thu, a.m., Waterway Ballroom 1
Bus S. J.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Bus S. J.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Buseck P. B.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Buseck P. R.  Early Solar System Posters, Tue, p.m., Town Center Exhibit Area
Buseck P. R.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Busefield A.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Busemann H.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Busemann H.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Bussey B. J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Bussey D. B. J.  Thermal and Magma Evolution Posters, Tue, p.m., Town Center Exhibit Area
Bussey D. B. J.  Lunar Surface Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Bussey D. B. J.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Bussey D. B. J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Bussey D. B. J.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Bussey D. B. J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Bussey D. B. J.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Butcher A.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Butterworth A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Butterworth A. L.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Butterworth A. L.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Buxner S.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Buxner S. R.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Buxner S. R.  EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Buxner S. R.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Buzz J.*  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Byerly G.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Byrne C. J.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Byrne C. J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Byrne P. K.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Byrne S.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Byrne S.*  Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom I
Byrne S.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Byrne S.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Byrne S.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Byrne S.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Byrne S.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Byrne S.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Byrne S.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Byrne S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Byrnes J. J.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Byrnes J. M.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
C1XS Team  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Cabrol N. A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Cabrol N. A.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Cadieux S. B.*  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Caffee M. W.  Achronorrites, Mon, p.m., Waterway Ballroom 4
Caffee M. W.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Caffee M. W.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Caffee M. W.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Caffrey M.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Cahill J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Cahill J. T. S.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Cahill J. T. S.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Cahill J. T. S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Cahill J. T. S.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Cahill J. T. S.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Cais P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Calaway M. J.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Calder E. S.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Calef F.  Mars Rovers and Landers Posters, Thu, p.m., Town Center Exhibit Area
Calef F.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calef F. J. III*</td>
<td>Mars Sediments, Wed, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calef F. J. III</td>
<td>Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calhoun P.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Callahan M. P.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Callahan M. P.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calvin W. M. *</td>
<td>Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell B. A.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell B. A.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell B. A.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell B. A.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell B. A.</td>
<td>Lunar Impacts II, Fri, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campbell D. B.</td>
<td>Lunar Impacts II, Fri, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Campo Bagatin A. *</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canizo T. L.</td>
<td>EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cañizo T. L.</td>
<td>Education and Public Outreach, Tue, p.m., Montgomery Ballroom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cañizo T. L.</td>
<td>EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cannarsa F. *</td>
<td>Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cantor B. A.</td>
<td>Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canup R. M.</td>
<td>Print Only: Cosmochemical Origins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cao H.</td>
<td>Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capaccioni F.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capaccioni F.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capek D.</td>
<td>Small Bodies Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capitan R. D. *</td>
<td>Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caporali S.</td>
<td>Print Only: Differentiated Meteorites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caporali S.</td>
<td>Print Only: Exobiology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caprarelli G.</td>
<td>Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capria M. T.</td>
<td>Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capria M. T.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carbonneau P.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carich B.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cariche B. T.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardinale M.</td>
<td>Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cardinale M.</td>
<td>Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carl C.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlson R. W.</td>
<td>Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlson R. W.</td>
<td>Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlson R. W.</td>
<td>Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlson R. W.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carlsson E.</td>
<td>Venus Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carmosino M. L.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carmosino M. L.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpenter P.</td>
<td>Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpenter P. K.</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrico P.</td>
<td>EPO Undergraduate Education Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carroll K. A.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartacchi M.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L.</td>
<td>Mars Sediments, Wed, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter J.</td>
<td>From Mantle to Crust, Fri, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter J. A.</td>
<td>Print Only: Education and Public Outreach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter J. A.</td>
<td>Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter J. A.</td>
<td>Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L. M.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L. M.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L. M.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L. M.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter L. M.</td>
<td>Lunar Impacts II, Fri, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carter M.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartwright J. A.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Topic</td>
<td>Day</td>
<td>Time</td>
<td>Room</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------</td>
<td>------------</td>
<td>--------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Cartwright J. A. *</td>
<td>Vesta and HEDs</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Cartwright R.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Carvajal-Ortiz H.</td>
<td>Crusty Mars Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Carvano J. M.</td>
<td>Small Bodies</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Case A.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cassidy T.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cassini Radar Team</td>
<td>Titan Everything Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Castaño R.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Castillo J.</td>
<td>Icy Surfaces and Interiors Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Castillo-Rogez J. C. *</td>
<td>Planetary Geophysics and Processes</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Castillo-Rogez J. C.</td>
<td>Planetary Differentiation Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Catling D.</td>
<td>Carbon on Mars</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Catling D. C. *</td>
<td>Icy Surfaces and Interiors Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Caudill C.</td>
<td>Geology of Martian Impact Craters Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cavell R. G.</td>
<td>Mars Alteration Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cavosie A. J.</td>
<td>Impacts II Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cavosie A. J.</td>
<td>Shocked Mineral Grains</td>
<td>Wed</td>
<td>p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Ceamanos X.</td>
<td>Mars Instruments Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Cébron D.</td>
<td>Formation and Evolution of the Moon I</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Cedillo Y.</td>
<td>Crusty Mars Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Centeno J. D.</td>
<td>Print Only: Mars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceuleneer G.</td>
<td>Special Session: Planetary Magmatic Volatiles</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Chabot N. L.</td>
<td>Asteroid Geophysics and Processes</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Chabot N. L.</td>
<td>Iron Meteorites and Pallasites Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chabot N. L.</td>
<td>Planetary Differentiation</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Chadwick J.</td>
<td>Igneous Processes Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chaffin M.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chakrabarti R.</td>
<td>Lunar Crust Samples Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chakrabarty S.</td>
<td>Impacts II Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chakraborthy S.</td>
<td>Cosmochemical Origins I</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Chakraborthy S.</td>
<td>Cosmochemical Origins I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chakraborthy S.</td>
<td>Primitive Meteorites II</td>
<td>Fri</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Chan K. L.</td>
<td>Moon Missions and Samples Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chan M. A.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chang H.-K.</td>
<td>Small Bodies Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Changella H. G.</td>
<td>Dusty Horizons</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Changella H. G.</td>
<td>From Mantle to Crust</td>
<td>Fri</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Chanou A.</td>
<td>Impacts II Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chanou A.</td>
<td>Environmental Analogs Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chanover N. J.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Chaukus J.</td>
<td>Mars Instruments Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chapman C. R.</td>
<td>Mercury, Mon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chapman C. R.</td>
<td>Lunar Impacts I</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Chapman M. G.</td>
<td>Martian Layered Deposits Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chapman S.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Chapman T. A.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chauher B.</td>
<td>Formation and Evolution of the Moon II</td>
<td>Tue</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Charnley S. B.</td>
<td>Cosmochemical Origins I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Charnley S. B.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Charnoz S.</td>
<td>Print Only: Cosmochemical Origins</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Charon E.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Chartres J.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Châteauneuf F.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chauhan P.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Chauhan P.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Chaumard N.</td>
<td>Primitive Meteorites II</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Chaung F. C.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Chaussidon M.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Chaussidon M.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Chavers D. G.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Che C.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Che C.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Cheek L.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Cheek L.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Cheek L. C.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Cheek L. C.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
ChemCam Team  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Chen B.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Chen C.  Print Only: Moon
Chen C.  Print Only: Moon
Chen C. H.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Chen J. C.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Chen J. H.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Chen J. H.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Chen S. B.  Print Only: Moon
Chen W. H.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Cheng A. F.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Cheng A. F.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cheng M. J.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Cheng Y.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Cheng Y.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cheng Y.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Chetty C. V.  Print Only: Missions, Instruments, and Payload Concepts
Cheuung K. K.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Chevrel O.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Chevrel O. M.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Chevrier V.  Print Only: Moon
Chevrier S.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Chevrier S. D.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Chevrier V.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Chevrier V.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Chevrier V.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V. F.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Chevrier V. F.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V. F.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V. F.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V. F.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Chevrier V. F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Chi P.  Moon Apollo-Lunokhod Legacy Posters, Thu, p.m., Town Center Exhibit Area
Chi P. J.  Moon Apollo-Lunokhod Legacy Posters, Thu, p.m., Town Center Exhibit Area
Chicarro A. F.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Chien S.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Chien S.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Chin G.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Chin G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Chin G.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Chipera S. J.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Chisholm M. F.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Chittenden J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Chizzmadia L. J.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Cho Y.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Choi B.-G.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Choi D. S.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Choi Y.  Print Only: Igneous Processes
Choi Y.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Choi Y.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Chojnacki M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Chojnacki M.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Chojnacki M.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Chojnacki M.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Choo T. H.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Chopra N.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Choukroun M.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Choukroun M.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Choukroun M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Christensen P. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Christensen P. R.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Christensen P. R.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Christensen U. R.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Christian S.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Christian S.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Christiansen E. H.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Christiansen H. H.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Chu P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Chu W. K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Chuang F. C.  Print Only: Mars
Chuang F. C.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Chuang F. C.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Chuang F. C.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Chuang F. C.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Chuang Y.-L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Chun J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Ciarletti V.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Cicchetti A.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Ciesla F. J.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Ciesla F. J. *  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Ciesla F. J.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Ciesla F. J.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Cintala M. J.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Cintala M. J.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Cintron N. O. *  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Cisneros E. B.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Clayes P.  Impact II Posters, Tue, p.m., Town Center Exhibit Area
Clayes P.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Clark B. C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Clark B. C.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Clark B. E.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Clark C. S.  Print Only: Education and Public Outreach
Clark M. E.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Clark P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Clark P. E.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Clark P. E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Clark R.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Clark R. N.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Clark R. N.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Clark R. N.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Clark S. E.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Clarke A. B.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Clarke J.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Clarke J. D. A.  Print Only: Mars
Clarke J. D. A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Claydon J. L.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Clegg R. N.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Clegg S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Clegg S. M.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Clegg S. M.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Clegg S. M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Clegg S. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Clegg S. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Clemett S. J.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Clemett S. J.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Clenet H.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Clenet H.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Clifford S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Clifford S. M. * Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Cloetens P.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Cloetens P.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Cloutis E.  Materials Analog posters, Tue, p.m., Town Center Exhibit Area
Cloutis E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Cloutis E. A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Cloutis E. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Cloutis E. A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Cloutis E. A.  A Pre-Dawn Perspective, Thu, p.m., Town Center Exhibit Area
Cloutis E. A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Cloutis E. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Coates A. J.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Coates A. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
CoBabe-Ammann E.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Cochran A. L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Cockrell J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cody G. D.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Cody G. D.  Organic and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Cohen B. A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Cohen B. A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cohen B. A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Cohen B. A.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Cohen B. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Cohen J.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Cohen J.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Coker K.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Colaprete A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Colaprete A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Colaprete A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Colas F.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Cole M. J.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Cole M. J.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Cole M. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Cole S. B.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Coleman N. M.  Print only: Mars
Coleman S. J.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Colles K. S.  EPO Undergraduate Education Posters, Thu, p.m., Town Center Exhibit Area
Collier M. R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Collins G. C.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Collins G. S.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Collins G. S.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Collins G. S.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Collins G. S.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Collins G. S.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Collins G. W.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Collins L. R.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Collins M. J. S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Collins S.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Colon C. M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Colon C. M.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Colson A. D.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Colson R. O. * Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Coman E. I. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Coman E. I. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Combe J.-Ph. * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Combe J.-Ph. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Combe J.-Ph. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Combe J.-Ph. Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Combi M. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Connelly J. N. Formation and Evolution of the Moon II, Tue, p.m., Waterway Ballroom 6
Connolly H. C. Jr. Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Connolly H. C. Jr. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Connon S. A. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Conrad P. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Conrad P. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Conrad P. Print Only: Mars
Conrad P. G. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Conrad P. G. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Consolmagno G. J. Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Conway S. J. * Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Conway S. J. Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Conway S. J. Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Cook A. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Cook A. C. The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Cook A. C. Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Cook D. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Cook D. Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Cook J. C. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Cook T. S. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cooper B. L. Print Only: Moon
Cooper B. L. The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Cooper G. * Exobiology II, Thu, a.m., Waterway Ballroom 1
Cooper R. F. Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Coradini A. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Cordier C. Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Cordier D. Print Only: Cosmochemical Origins
Cordier D. Print Only: Outer Solar System
Cormier S. * Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Cornec J. H. Print Only: Impacts
Cornet T. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Cornet T. Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Cornsish T. J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Corrigan C. M. Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Corrigan C. M. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Corrigan C. M. Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Cortes J. Print Only: Small Bodies
Cosarinsky M. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Costard F. Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Costard F. Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Coulson I. M. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Cousin A. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Cousin A. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Cousins C. R. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Coustens A. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Couzin P. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cox A. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Cox R. Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Cox R. T. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Coy S. L. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Cradock P. R. * Carbon on Mars, Thu, p.m., Waterway Ballroom 1
Cradock R. A. Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Cradock R. A. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Craft J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Craft K. L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Craig J. P. * Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Craig M. A. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Craig M. A. Mars Alteration, Wed, p.m., Waterway Ballroom 1
Cramer S. P. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Crary F. J. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Crawford D. A. Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Crawford D. A. Impact Experiments, Wed, a.m., Montgomery Ballroom
Crawford I. A. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Crawford I. A. Mars Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Crawford I. A. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Crawford J. Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Cremonese G. Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Cremonese G. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Cressey G. Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
CRISM Team Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
CRISM Team Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Crisp J. A. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Cristallo S. Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Cristarela T. C. Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Crits S. T. Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Crits S. T. The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Crits S. T. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Crme A. E. Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Croat T. K. * Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Croft S. K. * Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Croft S. K. EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Croft S. K. EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Crósta A. P. Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Crotts A. P. S. Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Crotts A. P. S. The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Crown D. A. Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Crown D. A. EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Crown D. A. Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Crown D. A. Venus Posters, Tue, p.m., Town Center Exhibit Area
Crown D. A. EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Crown D. A. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Crown D. A. Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Crown D. A. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Crowther S. A. Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Crowther S. A. * Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Cruikshank D. Small Bodies, Mon, a.m., Waterway Ballroom 5
Cruikshank D. P. Mini-Mimas, Thu, p.m., Montgomery Ballroom
Crumpier L. * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Crumpier L. S. Mars: Terrestrial Analogas Posters, Tue, p.m., Town Center Exhibit Area
Crumpier L. S. Environmental Analogas Posters, Tue, p.m., Town Center Exhibit Area
Cserich D. EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Cudnik B. M. EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Cudnik B. M. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Cull S. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Cull S. Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Cull S. C. Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Cupelli C. L. Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Cupelli L. Environmental Analogas Posters, Tue, p.m., Town Center Exhibit Area
Curran L. L. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Currie D. G. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Currie T. M. Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Curry A. S. Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Curti R. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Cushing G. E. Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Cushing G. E.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Cutri R.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Cutri R.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Cutri R. M.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Cutri R. M.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Cvicek V.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
D’Amore M. * Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Da Deppo V.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Dalley J.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Dalley J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Daisaka H.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Dallmann N.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Dalton H.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Dalton J. B.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Dalton J. B.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Dalton J. B. III  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Daly M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Daly R. G.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Daly T.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Daly T.  Mars Instruments Posters, Tue, p.m., Town Center Exhibit Area
D’Amore M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Daniels J. T. M.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Danielson L.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Danielson L. R.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Dankanich J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Daou D.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Daou D.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Dartnell L. R.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Das J. P.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Das P. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Das S.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Dasgupta R.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Daubar I. J. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Daub K.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Daulton T. L.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Daulton T. L.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Dauny F.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Dauphas N.  Carbon on Mars, Tue, p.m., Waterway Ballroom 6
Dauphas N. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Dauphas N.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Dauphas N.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Dauphas N.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Dauphas N.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Dauphas N.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Daus C.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Davatzes A. E. * Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Davatzes A. E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Davatzes A. K.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Davatzes N. C.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Dave R.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Davidson J.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Davidson J. * Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Davidsson B.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Davies A. G.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Davies A. G.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Davies C.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Davies S. J.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Davila A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Davila A. F.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Davila A. F.  Print Only: Mars
Davila A. F.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Davila A. F.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Davis A. M.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Davis A. M.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Davis A. M.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Davis A. M.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Davis A. M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Davis A. M.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Davis A. M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Davis B. J.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Davis D. R.  Print Only: Small Bodies
Davis K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Davis M.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Davis M. W.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Davis R.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Davis R.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Davis T. M.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Davis T. M.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Dawn Science Team  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Dawn Team  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Dawson M. D.  Moon Apollo-Lunokhod Legacy Posters, Thu, p.m., Town Center Exhibit Area
Day B.  Education and Public Outreach, Thu, p.m., Montgomery Ballroom
Day B. H.  Education and Public Outreach, Thu, p.m., Montgomery Ballroom
Day B. H.  EPO Moon Posters, Thu, p.m., Town Center Exhibit Area
Day J. M. D.  Achondrites, Mon, p.m., Waterway Ballroom 4
Day J. M. D.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Day J. M. D.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Day J. M. D.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Day J. M. D.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Day M. D.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Daydou Y.  Print Only: Moon
Daydou Y.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Daydou Y.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
De Carli P. S.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
De Cecco M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
De Gregorio B. T.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
De Hon R. A.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
De Jong E.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
De Leenheer N. H.  Print Only: Cosmochemical Origins
De León J.  Print Only: Small Bodies
de Mijolla G. M.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
de Moor J. M.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
de Pablo M. A.  Print Only: Mars
de Pablo M. A.  Print Only: Planetary Atmospheres
De Rose R.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
De Sanctis M. C.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
De Sanctis M. C.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
de Silva S. L.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
de Villiers G.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
de Villiers G.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
de Vries J.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Deák M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Deans M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Deans M. C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Dearholt W. R.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
DeBaun E.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Debei S.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Deblois S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Debus T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Deenadayalan K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
DeFlores L.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Defouilloy C.  Print Only:  Differentiated Meteorites
Dehant V.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Dehouck E.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Del Genio A. D.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Delamere W.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Delamere W. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Delaney J. S.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Delaney J. S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Delaney J. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Delaney J. S. * Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
DeLano K.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Delbo M.  Small Bodies, Mon, a.m., Waterway Ballroom 5
DellaGiustina D. N.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Dell’Agnello S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Delle Monache G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Dello Russo N.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Dello Russo N. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Delory G. T.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Delory G. T.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Delory G. T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
DeMeo F. E.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Demidova S. I.  Print Only: Moon
Demenceaux C.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Demura H.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Demura H.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Denevi B.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Denevi B. W.  Mercury, Mon, p.m., Waterway Ballroom 1
Denevi B. W.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Denevi B. W.  Thermal and Magmaic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Denevi B. W.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Denevi B. W.  Materials Analogos Posters, Thu, p.m., Town Center Exhibit Area
Denevi B. W.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Denevi B. W.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Denevi B. W.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Denk T.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Dennie D. P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Densmore A. L.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Dergham J.  Print Only: Small Bodies
DeSanctis M. C.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Desch S. J.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Desch S. J. * Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Desch S. J.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Desert RATS Science Team  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Deutsch A.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Deutsch A.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Devidal J.-L.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Devouard B.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Devouard B.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Deymier P. A.  Print Only: Cosmochemical Origins
Dhingra D.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Dhingra D. * Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Di Cicco M.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Diaz E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
DiBraccio G. A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
DiCarlo N.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
DiCicco M.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Dickinson R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Dickson J. L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Dickson J. L. * Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Dickov J. L.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Dikov E. N.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Dikov Yu. P.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ding W.</td>
<td>Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dingizian A</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Diniega S.</td>
<td>Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Diniega S.</td>
<td>Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Diniega S.</td>
<td>Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Dinwiddie C. L.</td>
<td>Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Direito S.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Di Santi M. A.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Dissmore S.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Dixi Imaging Science Team</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Dixi Science Team</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Dixon J.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dixon J. C.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Doan D.</td>
<td>Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dobrica E.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dobrica E.</td>
<td>Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Dobrica E. *</td>
<td>Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Dohi K.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Print Only: Mars</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Print Only: Exobiology</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dohm J. M.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dohi M.</td>
<td>Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dolgopolov V. P.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Doll R.</td>
<td>Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dom bard A. J.</td>
<td>Mini-Mimas, Thu, p.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Dom bard A. J.</td>
<td>Lunar Impacts II, Fri, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Dominguez D. L.</td>
<td>Mercury, Mon, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Dominguez D. L.</td>
<td>Mercury Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dominguez G.</td>
<td>Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donaldson Hanna K.</td>
<td>Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donaldson Hanna K.</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Donaldson Hanna K. L.</td>
<td>Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donaldson Hanna K. L. *</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Donaldson Hanna K. L.</td>
<td>Mars Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Dones L.</td>
<td>Mini-Mimas, Thu, p.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Donohue P.</td>
<td>Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donohue P.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donohue P. H.</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Donohue P. H. *</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Donohue P. H.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donohue P. H.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donohue P. H.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Donovan J.</td>
<td>Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Doran B.</td>
<td>Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Doressoundiram A.</td>
<td>Small Bodies Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dorsey R. J.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dougherty A. J.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dougherty M. K.</td>
<td>Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Douglas S.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Doute S.</td>
<td>Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Douté S.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Dove A.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Downes H.</td>
<td>Achondrites, Mon, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Downs R. T.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Downs R. T.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Drake M. J.  Print Only: Cosmochemical Origins
Drake M. J.  Print Only: Mars
Draper D. S.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
DRATS Science Team  Print Only: Missions, Instruments, and Payload Concepts
DRATS Science Team  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Dreeland L.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Driese S. G.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Droege G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Drossart P.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Drummond S. A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Drummond S. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Du J. S.  Print Only: Moon
Duchesne M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Dufek J.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Dufek J.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Duffard R.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Duffard R.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Dufresne A.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Duhamel R.  Print Only: Differentiated Meteorites
Dukes C. A.  Print Only: Moon
Dukes C. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Dulin S. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Dumke A.  Mars: Large Volcanos and Flows Posters, Thu, p.m., Town Center Exhibit Area
Dumke A.  Martian Layered Deposits Posters, Thu, p.m., Town Center Exhibit Area
Dundas C.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Dundas C.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Dundas C. M. *  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Dundas C. M.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Dundas C. M.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Dundas C. M.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Dundas C. M.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Dunlop D.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Dunn T.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Dunn T. L.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Dupire R.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Durda D. D.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Durham W. B.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Durr N.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Dust Science Team  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
d’Uston C.  Lunar Crust Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
d’Uston C.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Dutilleul P.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Duitut O.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Dworkin J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Dworkin J. P.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Dwyer C. A. *  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Dyar M. D.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Dyar M. D.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Dyar M. D.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Dyar M. D.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Dyar M. D.  Venus, Wed, p.m., Montgomery Ballroom
Dyar M. D. *  Exobiology II, Thu, a.m., Waterway Ballroom 1
Dyar M. D.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Dyar M. D.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Dyar M. D.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Dyar M. D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Dyar M. D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Dyches P.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Dygen N. *  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Dyl K. A. * Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Ebel D. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Ebel D. S. Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Ebel D. S. Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Ebel D. S. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Ebel D. S. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Ebel D. S. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Ebel D. S. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Ebel D. S. Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Ebert M. * Impact Experiments, Wed, a.m., Montgomery Ballroom
Ebihara M. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Ebihara M. * Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ebihara M. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Ecelberger S. A. * Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Economou T. E. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Edgar L. A. Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Edmundson K. Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Edmunson J. Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Edwards C. S. * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Edwards L. J. Print Only: Mars
Egan A. F. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Egan A. F. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Eggert J. H. Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Ehlmann B. L. Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Ehlmann B. L. Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Ehlmann B. L. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ehrenfreund P. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Ehresmann B. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ehsan N. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Eiceman G. A. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Eigenbrode J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Eigenbrode J. E. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Eigenbrode J. E. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Elongbrode J. L. Print Only: Mars
Eigenbrode J. L. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Eiler J. M. Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Eiler J. M. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Eke V. R. Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Eke V. R. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
El Maarry M. R. Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
El Maarry M. R. Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
El Senousy A. Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Elam J. Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Elam J. Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Elardo S. M. * Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Elardo S. M. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Elardo S. M. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Elbeshausen D. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Elbeshausen D. Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Elken L. Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
El'gygytgyn Science Team Impacts II Posters, Tue, p.m., Town Center Exhibit Area
El'gygytgyn Scientific Party Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Elision E. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Elision E. M. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Elkins-Tanton L. T. Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Elkins-Tanton L. T. * Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Elkins-Tanton L. T. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Elkins-Tanton L. T. Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Ellery A. Environmental Analogs Posters, Thu, p.m., Town Center Exhibit Area
Elliott H. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Elliott T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ellis R. S.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Elmog R. D.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Elphic R. C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Elphic R. C. * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Elphic R. C.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Elphic R. C.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
ElSenousy A.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
ElShafee A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
ElSila J. E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
ElSila-Cook J.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Elphic R. C.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Elphic R. C.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
ElSenousy A.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Elphic R. C.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Emery J. P.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Emery J. P.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Emery J. P.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Emery J. P.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Endo T.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Eng D. S.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Engert P.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Engrand C.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Enns A. C.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Enriquez J. E.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
EPOXI Earth-Based Team  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
EPOXI/DIXI Science Team  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Eppler D.  Print Only: Missions, Instruments, and Payload Concepts
Eppler D.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Eppler D. B.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Epplw A.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Epplw A. D.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Erb I. R.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Erdélyi S.  EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Erickson G. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Erickson T. M. * Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Erkeling G. * Mars Sediments, Wed, a.m., Waterway Ballroom 1
Erkeling G.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Ernst C. E.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Ernst C. M.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Ernst C. M.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Ernst C. M.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Ernstson K.  Print Only: Cosmochemistry Print Only
Eshwehdi A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Esposito L.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Esposito L. W.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Estrada P. R.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Estrada P. R. * Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
EuroGeoMars MDRS Team  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Evans C.  Print Only: Missions, Instruments, and Payload Concepts
Evans C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Evans C. A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Evans L.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Evans L.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Evans L. G.  Mercury, Mon, p.m., Waterway Ballroom 1
Evans L. G.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Evans L. G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Evans R.  Print Only: Moon
Evans S. C.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Fa W.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Faestermann T.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Faestermann T.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area

264  42nd LPSC Program Index
Fagan A. L.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Fagan A. L. * Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Fagan T. J.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Fagan T. J. * Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Fahie J.  Print Only: Mars
Fahnestock E.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Fairén A. G.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Fairén A. G.  Print Only: Mars
Falke M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
FAR DEEP Science Team  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Farah A. E.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Farah A. E.  Print Only: Mars
Farinelli A. G. Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Falke M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Farrell W. M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Farrell W. M. * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Farrell W. M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Farrar J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Farrand W. H.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Farrand W. H.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Farrar J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Farrar J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Farrar J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Fastook J. L. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Fastook J. L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Fay D.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Fay J.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Feaga L. M. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Feaga L. M.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Fedorov A.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Fei Y. * Mercury, Mon, p.m., Waterway Ballroom 1
Fei Y.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Feldman P. D.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Feldman P. D.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Feldman S.  Venus Posters, Thu, p.m., Town Center Exhibit Area
Feldman S. M.  Venus Posters, Thu, p.m., Town Center Exhibit Area
Feldman W. C.  Special Session: Mars: Large Volcanos and Flows Posters, Thu, p.m., Town Center Exhibit Area
Feldman W. C.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Feldman W. C.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Feldman W. C.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Feldman W. C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Feng S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Fennema A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Fenton L.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Fenton L. K.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Fergason R.  Mars: Large Volcanos and Flows Posters, Thu, p.m., Town Center Exhibit Area
Fernandes V. A. S. M.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Fernandes V. A. S. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Fernandes V. A. S. M. * Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Fernandez Y. R.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Day, Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferrari M. J.</td>
<td>Materials Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ferrari S.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ferreira A.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ferrière L. *</td>
<td>Terrestrial Impact Craters</td>
<td>Tue, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Ferrière L.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ferrière L.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ferrill D. A.</td>
<td>Planetary Dynamics and Tectonics</td>
<td>Thu, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Ferris J. C.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Feuten F.</td>
<td>Mars Sediments</td>
<td>Wed, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Fiechter-Beyer S. K.</td>
<td>Asteroid Studies Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fiethe B.</td>
<td>Venus</td>
<td>Wed, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Figueiredo P.</td>
<td>Materials Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Figueroa M.</td>
<td>The Medusae Fossae Formation Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Filacchione G.</td>
<td>Asteroid Studies Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Filacchione G.</td>
<td>Mini-Mimas</td>
<td>Thu, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Filacchione G.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fillingim F. O.</td>
<td>Special Session: Planetary Magmatic Volatiles</td>
<td>Mon, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Fillingim F. J.</td>
<td>Mars Alteration Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fischer T. P.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fischer W. W.</td>
<td>Exobiology I</td>
<td>Thu, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Fischer-Gödde M.</td>
<td>Special Session: Planetary Magmatic Volatiles</td>
<td>Fri, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Fisenko A. V.</td>
<td>Print Only: Interplanetary and Presolar Dust</td>
<td></td>
</tr>
<tr>
<td>Fisenko A. V.</td>
<td>Presolar Grains Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flahaut J.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flahaut J.</td>
<td>Igneous Geochemistry Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flahaut J.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flasar M.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flauhaut J.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fleck J. R.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fleischer I.</td>
<td>Materials Analogs Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fleischer I.</td>
<td>Mars Alteration</td>
<td>Wed, p.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Fleischnner R.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flemming R.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flemming R. L.</td>
<td>Small Bodies</td>
<td>Mon, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Flemming R. L.</td>
<td>Achondrites Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flemming R. L.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flemming R. L.</td>
<td>Exobiology Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Floss C. *</td>
<td>Unraveling the Origins of Presolar Grains</td>
<td>Tue, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Floss C.</td>
<td>Presolar Grains Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Floss C.</td>
<td>Early Solar System Reservoirs II</td>
<td>Wed, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Floss C.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Floss C.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Floss C.</td>
<td>Organics and Volatiles in Chondritic Meteorites</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Floss C. *</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Floss C. F.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flowers R. M.</td>
<td>Shocked Mineral Grains</td>
<td>Wed, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Floyd S.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flynn G.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Flynn G. J.</td>
<td>Cosmochemical Origins I Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flynn G. J. *</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Flynn G. J.</td>
<td>Dusty Horizons I Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Flynn G. J.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fofi D.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fogel M.</td>
<td>Carbon on Mars</td>
<td>Tue, p.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Fogel M.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fogel M.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Fogel M.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Fogel M. L.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Foing B.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Foing B. H.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Folco L.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Fong T.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Fong T.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Fong T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Fong T.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Fonti S.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Foote K. R.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Ford S. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Forde J.  Mercury, Mon, p.m., Waterway Ballroom 1
Forget F.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Forget F.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Fornasier S.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Forni O.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Forni O.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Forni O.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Forni O.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Fortezzo C. M.  Print Only: Data Tools, Access, and Archiving
Fortezzo C. M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Fortezzo C. M.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Fortezzo C. M.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Fortt A. L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Foster E.  Mars Rovers and Landers Posters, Thu, p.m., Town Center Exhibit Area
Foucher F.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Foucher F.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Fougeray P.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Fountain A. G.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Fountain A. G.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Fournelle J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Fraeman A. A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Franchi I.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Franchi I. A.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Franchi I. A.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Franchi I. A.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Franchi I. A.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Franchi I. A.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Francis D.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Francis R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Frank D.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Frank D.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Frank D.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Frank D.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Franz H. B.  Print Only: Mars
Franz H. B.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Franz H. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Frasl B.  * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Frawley J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Frawley J.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Freedman R.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Frey H. V.  * Mars Sediments, Wed, a.m., Waterway Ballroom 6
Frey H. V.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Frey H. V.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Friedlander J. S.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Friedrich J. M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Friedrich J. M.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Friedrich J. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Friend P.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Fries J.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Fries J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Fries M.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Fries M.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Fries M.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Fries M. D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Frisk Å.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Fritz J. * Impact Experiments, Wed, a.m., Montgomery Ballroom
Fritz J.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Fritz J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Fritz J. P.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Froman S.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Frost D. J.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Frunland R. M.  Print Only: Moon
Fry C.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Fu Q. * Carbon on Mars, Tue, a.m., Waterway Ballroom 1
Fu Q.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Fuentes F.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Fujimura A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Fujimura A.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Fujita T.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Fujitani T.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Fujii W.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Fujii W.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Fujii W. * Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Fukuhara T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Fukushima K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Fulchignoni M.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Fulle M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Fuller M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Funaki M.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Funsten H. O.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Furfaro R.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Furfaro R.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Furumoto M.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Futaana Y.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Futó P.  Print Only: Planetary Dynamics and Tectonics
Futó P.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Futó P.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Gaddis L.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Gaddis L.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Gaddis L.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Gaddis L. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Gaddis L. R.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Gaddis L. R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Gaffey M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Gaffey M. J.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Gaffey M. J.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Gaffey M. J.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Gaffney A. M. * Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Gaidos E.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Gaidos E. * Exobiology I, Thu, a.m., Waterway Ballroom 1
Gail H.-P.  Print Only: Small Bodies
Gainey S. R.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Gainsforth Z.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Gainsforth Z.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Gaither T. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Galenas M. G. * Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Galgana G. A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Galindo C.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Gallegos Z. E.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Gallegos Z. E.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Gallino R.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Galuba G. G.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Galuszka D.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gan F. P.</td>
<td>Samples and Spectroscopy Posters</td>
<td>Tue, p.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ganguly J. *</td>
<td>Primitive Meteorites II</td>
<td>Fri, p.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Gao S.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garber J. M.</td>
<td>Terrestrial Impact Craters</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Garber J. M.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garber J. M.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garcia C. S.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garcia K. A.</td>
<td>Planetary Differentiation</td>
<td>Thu, a.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Garcia P. A.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garcia R. R.</td>
<td>Impacts I Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gardner P. B.</td>
<td>Exobiology I</td>
<td>Thu, a.m.</td>
<td>Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Gardner-Vandy K. G.</td>
<td>Planetary Differentiation</td>
<td>Thu, a.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Gargani J.</td>
<td>Crusty Mars Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garnero E. J.</td>
<td>Formation and Evolution of the Moon I</td>
<td>Mon, p.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Garrick-Bethell I. *</td>
<td>Formation and Evolution of the Moon II</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Garrison D. H.</td>
<td>Formation and Evolution of the Moon III</td>
<td>Tue, p.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Garry B.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garry W. B.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garry W. B.</td>
<td>Mars: Terrestrial Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garry W. B.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garry W. B.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvie L. A. J.</td>
<td>Organics and Volatiles in Chondritic Meteorites</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvin J.</td>
<td>Asteroid Discovery Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvin J.</td>
<td>Moon Missions and Samples Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvin J. B.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Garvin J. B.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvin J. B.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Garvin J. B. *</td>
<td>Lunar Impacts I, Fri, a.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gaskell R.</td>
<td>Moon Datasets Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gasnault O.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gasnault O.</td>
<td>Igneous Geochemistry Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gasnault O.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gasnault O.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gasnault O.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gattacceca J.</td>
<td>Impact Experiments</td>
<td>Wed, a.m.</td>
<td>Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Gaudin A.</td>
<td>Mars Alteration Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gavin P.</td>
<td>Mars: Terrestrial Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gavin P. *</td>
<td>Field and Laboratory Analogs Posters</td>
<td>Wed, a.m.</td>
<td>Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Gavin P.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gay P.</td>
<td>Education and Public Outreach</td>
<td>Tue, p.m.</td>
<td>Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Gay P. L. *</td>
<td>Education and Public Outreach</td>
<td>Tue, p.m.</td>
<td>Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Gehrels G. G.</td>
<td>Print Only: Mars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gehrz R. D.</td>
<td>Unraveling the Origins of Presolar Grains</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Geissler P. E.</td>
<td>Volcanism in the Outer Solar System Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Geissler P. E. *</td>
<td>Mars Aeolian Processes</td>
<td>Fri, a.m.</td>
<td>Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Gellert R.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gellert R.</td>
<td>Mars Alteration</td>
<td>Wed, p.m.</td>
<td>Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Gellert R.</td>
<td>Field and Laboratory Analogs Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gellissen M.</td>
<td>Print Only: Cosmochemistry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gellissen M.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gellissen M.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gellissen M.</td>
<td>SNC Meteorites Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gellissen M.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Genda H.</td>
<td>Impacts I Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Genda H. G.</td>
<td>Exobiology Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gérard J. C.</td>
<td>Atmospheres: Observations and Processes Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gerasimenko I.</td>
<td>Lunar Impacts I, Fri, a.m.</td>
<td>Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gerasimov M. V.</td>
<td>The Dust Bin Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gernhardt M.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Poster Session</td>
<td>Location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>-------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gernhardt M. L.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gersch A.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getty S.</td>
<td>Exobiology Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Getty S. A.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghafoor N.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghent R.</td>
<td>Venus Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghent R. R.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghent R. R.</td>
<td>The Dust Bin Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ghosh S. K.</td>
<td>Planetary Differentiation</td>
<td>Thu, a.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giaconini L.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibb E. L.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibb R. J.</td>
<td>Impact Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibbons L. J.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson E. K.</td>
<td>EPO Moon Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson E. K. Jr.</td>
<td>Carbon on Mars</td>
<td>Tue, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson E. K. Jr.</td>
<td>Exobiology Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson J.</td>
<td>Primitive Meteorites I</td>
<td>Thu, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson K. E.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson R. L.</td>
<td>Terrestrial Impact Craters</td>
<td>Tue, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gibson R. L.</td>
<td>Impact Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giese B.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gietzen K. M.</td>
<td>Primitive Meteorites I</td>
<td>Thu, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gifford P. K.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gigler A.</td>
<td>Aichondrites Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giguere T.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giguere T. A.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giguere T. A.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilbert A.</td>
<td>EPO Community Engagement Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillespie A. R.</td>
<td>Mars Altered Posters</td>
<td>Wed, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillespie R.</td>
<td>Mars Aeolian Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillet P.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillis-Davis J. J.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillis-Davis J. J.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillis-Davis J. J.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gillis-Davis J. J.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmore M.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmore M. S.</td>
<td>Venus Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmore M. S.</td>
<td>Mars Sediments</td>
<td>Wed, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmore M. S. *</td>
<td>Venus, Wed, p.m., Montgomery Ballroom</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmore I.</td>
<td>Organsics and Volatiles in Chondritic Meteorites Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmour J. D.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmour J. D.</td>
<td>Aichondrites Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gilmour J. D.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri, a.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gim Y.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giorgetti J. D.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I</td>
<td>Wed, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giuppi S.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gladstone G. R.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gladstone G. R.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glamoclija M.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glamoclija M.</td>
<td>Lunar Impacts II Posters</td>
<td>Fri, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gläser P.</td>
<td>Moon Datasets Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gläser P.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass B.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glavin D.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glavin D. P.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glavin D. P.</td>
<td>Exobiology II Posters</td>
<td>Thu, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glavin D. P.</td>
<td>Mars Alteration Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glavin D. P.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glaze L. S.</td>
<td>Venus Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glaze L. S.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gleeson D.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Gleeson D. F.  
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area

Glotch T.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Glotch T. D.  
Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6

Glotch T. D.  
Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area

Glotch T. D.  
Materials Analog Posters, Tue, p.m., Town Center Exhibit Area

Glotch T. D.  
Exobiology II, Thu, a.m., Waterway Ballroom 1

Glotch T. D.  
Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area

Gochenour J. P.  
Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area

Golembek M.  
Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area

Golembek M. *  
Mars Sediments, Wed, a.m., Waterway Ballroom 1

Golovin D.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Goonet A.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Gonzalez C. P.  
The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area

Gordon S.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Gopala Krishna B.  
Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area

Göpel C.  
Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5

Goswami J. N.  
Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area

Goto K.  
Impacts II Posters, Tue, p.m., Town Center Exhibit Area

Goudge T. A.  
Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Session/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goudge T. A.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gounelle M.</td>
<td>Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Gounelle M.</td>
<td>Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Gow J.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
</tr>
<tr>
<td>Goyal S. K.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Grady M. M.</td>
<td>SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Graf J.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
</tr>
<tr>
<td>Graf T.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gounelle M.</td>
<td>Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Grant J.</td>
<td>Mars Sediments, Wed, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Grant J.</td>
<td>Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Grant J. A.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Grant J. A.</td>
<td>Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Grassi D.</td>
<td>Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Grant J.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Graham E. E.</td>
<td>Mars Rovers and Landers Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Graham P.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Graham P.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Granahan J. C.</td>
<td>Small Bodies, Mon, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Granata V.</td>
<td>Print Only: Small Bodies</td>
<td></td>
</tr>
<tr>
<td>Grande M.</td>
<td>Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greeley R.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greeley R.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greeley R.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greeley R.</td>
<td>Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greeley R.</td>
<td>Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Green R.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Green R.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Green R. O.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenwood J. P.</td>
<td>Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Greenberg M. *</td>
<td>Dusty Horizons, Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Greenberger R. N.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Greenhagen B. T.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenwood J. P. *</td>
<td>Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Greenwood R. C.</td>
<td>Achnorrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Greenwood R. C.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gregg T. K. P.</td>
<td>Venus Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gregg T. K. P.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gregg T. K. P.</td>
<td>Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Greshake A.</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Greshake A.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>

272  42nd LPSC Program Index
Greshake A.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Griev A. J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Grieve R. A. F.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Grieve R. A. F.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Grieve R. A. F.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Grieves G. A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Griffes J.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Griffiths A. D.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Grimm R. E.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Grimm R. E.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Grimm R. E.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Grimm R. E.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Grimm R. E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Grin E.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Grinicius A.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Grindrod P. M.  Martian Layered Deposits Posters, Thu, p.m., Town Center Exhibit Area
Grisolle F.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Gritsevich M. I.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Grocott A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Groener E.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Grosfils E. B.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Gross C.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Gross C.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Gross C.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Gross J.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Gross J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Grosse C. U.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Grossman L.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Grossman L.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Grot M.  Planetary Dynamics and Tectonics, Thu, p.m., Waterway Ballroom 5
Grotzinger J.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Groussin O.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Groussin O.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Grove T. L.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Grove T. L.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Gruen E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Gruen E.  Environmental Analogs Posters, Thu, p.m., Town Center Exhibit Area
Gruener J. E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Grumpe A.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Grumpe A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Grun E.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Grün E.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Grundy W. M.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Grunthaner F. J.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Grunthaner P. J.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Grygorczuk J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Guallini L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Guallini L.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Guan Y.  Print Only: Mars
Guan Y.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Guan Y.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Guan Y.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Guan Y.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Guan Y.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Guan Y.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Gucsis A.  Print Only: Planetary Dynamics and Tectonics
Gucsis A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Poster Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guccik A.</td>
<td>Impact Experiments, Wed. a.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Guccik A.</td>
<td>Primitive Meteorites II Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guccik A.</td>
<td>Planetary Differentiation Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guddipati M.</td>
<td>Exobiology II, Thu. a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Guillermier C.</td>
<td>Early Solar System Reservoirs III, Fri. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Guillot B.</td>
<td>Formation and Evolution of the Moon III, Tue. p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Guinness E.</td>
<td>Mars Rovers and Landers Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guinness E. A.</td>
<td>Moon Apollo-Lunokhod Legacy Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guinness E. A.</td>
<td>Data Tools, Access, and Archiving Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Güldemeister N. *</td>
<td>Impacts: Modeling and Remote Sensing, Tue. p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Gunlauogsson H. P.</td>
<td>Field and Laboratory Analogs Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gunter M. E.</td>
<td>Instrument and Payload Concepts Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gupta S.</td>
<td>Mars Sediments, Wed. a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Gupta S.</td>
<td>Martian Fanclub Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gupta S.</td>
<td>Mars Fluvial Processes Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guzman S. J.</td>
<td>Dusty Horizons, Thu. p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Guzman S. J.</td>
<td>From Mantle to Crust, Fri. p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Gurrola E.</td>
<td>The Moon as an Airless Body Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guseva E. N.</td>
<td>Venus Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gustafson J. O.</td>
<td>Thermal and Magmatic Evolution Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gutierrez P.</td>
<td>Asteroid Photogeology Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guttery B. M.</td>
<td>Crusty Mars Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Guzewich S.</td>
<td>Planetary Mission Concepts Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gwinner K.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gyngard F.</td>
<td>Unraveling the Origins of Presolar Grains, Tue. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Gyngard F. *</td>
<td>Unraveling the Origins of Presolar Grains, Tue, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Gyollai I.</td>
<td>Primitive Meteorites I Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gyollai I.</td>
<td>Primitive Meteorites II Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Gyuk G.</td>
<td>A Pre-Dawn Perspective Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Haase I.</td>
<td>Moon Datasets Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagermann A.</td>
<td>The Medusae Fossae Formation Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagerty J. J. *</td>
<td>Formation and Evolution of the Moon III, Tue. p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Hagerty J. J.</td>
<td>Thermal and Magmatic Evolution Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagerty J. J.</td>
<td>Lunar Crust Remote Sensing Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagerty J. J.</td>
<td>Impacts II Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagerty J. J.</td>
<td>Planetary Mission Concepts Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hagiya K.</td>
<td>Early Solar System Reservoirs I, Wed. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Hahn B. C.</td>
<td>Mars Alteration Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hahn B. C.</td>
<td>From Mantle to Crust, Fri. p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Halbach P.</td>
<td>Geology of Martian Impact Craters Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Halbach P.</td>
<td>Impact Processes on Mars Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Halekas J. S.</td>
<td>Lunar Surface and Volatiles, Thu. p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Halekas J. S.</td>
<td>The Moon as an Airless Body Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Halekas J. S.</td>
<td>Instrument and Payload Concepts Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Halevy I. *</td>
<td>Carbon on Mars, Tue. p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Halevy I.</td>
<td>Mars Sediments, Wed. a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Hall B.</td>
<td>Field and Laboratory Analogs Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Halliday A. N.</td>
<td>Early Solar System Reservoirs I, Wed. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Hallis L. J.</td>
<td>SNC Meteorites Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Haltigin T. W. *</td>
<td>Special Session: Cryospheres II, Tue. a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Hamajima Y.</td>
<td>Special Session: Results from Hayabusa!, Thu. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Hamase K.</td>
<td>Special Session: Results from Hayabusa!, Thu. a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Hamel S.</td>
<td>Impacts: Modeling and Remote Sensing, Tue. p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Hames H.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hamilton C. W.</td>
<td>Volcanism in the Outer Solar System Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hamilton V. E. *</td>
<td>From Mantle to Crust, Fri. p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Hammel B.</td>
<td>Impacts: Modeling and Remote Sensing, Tue. p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Hammel H. B.</td>
<td>Small Bodies Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hammelgren M.</td>
<td>A Pre-Dawn Perspective Posters, Thu. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hammond M. S.</td>
<td>Planetary Mission Concepts Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Hammond N.</td>
<td>Planetary Mission Concepts Posters, Tue. p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Hammond N. P. * Mini-Mimas, Thu, p.m., Montgomery Ballroom
Hammond N. P. Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Hammond S. J. Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Hampton B. A. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Hamura T. Impact Experiments, Wed, a.m., Montgomery Ballroom
Han J. * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Han J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Han L. * Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Han S.-C. Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Hanada H. Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Hanada H. Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Hanada H. Print Only: Moon
Hand E. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Hand K. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Hanley J. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Hans U. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Hansen C. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hansen C. J. Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1
Hansen C. J. Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Hansen C. J. Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Hansford G. M. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hanson B. Z. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Han B. Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Han B. W. Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Harada M. Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Harada T. Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Harada Y. Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Harada Y. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Harcke L. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hardersen P. S. Small Bodies, Mon, a.m., Waterway Ballroom 5
Hardersen P. S. Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Hardgrove C. J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hare T. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Hare T. M. Print Only: Data Tools, Access, and Archiving
Hare T. M. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Hare T. M. Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Hare T. M. Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Hare T. M. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Hare T. M. Moon Datasets Posters, Tue, p.m., Town Center Exhibit Area
Hareyama M. Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Hareyama M. Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Hareyama M. Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Hargitai H. Print Only: Education and Public Outreach
Hargitai H. EPO Undergraduate Education Posters, Tue, p.m., Town Center Exhibit Area
Harju E. R. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Harlow G. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Harmon J. K. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Harmon J. K. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Harnett E. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Harper T. M. Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Harpol D. N. Print Only: Mars
Harpol D. N. Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Harries D. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Harrington R. S. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Harris D. W. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Harris R. S. Print Only: Impacts
Harris R. S. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Harriss W. M. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Harrison K. P. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Harrison K. P. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Harrison S. K. The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Harrison T. M. Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Harrison T. N.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Harshman K.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Harshman K.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hart R.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Hartman F.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Hartmann O.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Hartmann W.  Achnondrites Posters, Tue, p.m., Town Center Exhibit Area
Hartmann W. K.  Achnondrites, Mon, p.m., Waterway Ballroom 4
Hartmann W. K.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Haruyama J.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Haruyama J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Haruyama J.*  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Haruyama J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Haruyama J.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Harvey R.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Hasebe N.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Hasebe N.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Hasebe N.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Hasebe N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hasegawa S.  Print Only: Small Bodies
Hasegawa S.  Impacts I Posters,Tue, p.m., Town Center Exhibit Area
Hasegawa S.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Hasegawa S.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Hasegawa S.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Hasegawa S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hasegawa T.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Hash C.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Hashimoto T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Hashimoto T.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Hashizume K.*  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Hashizume K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Hasler D. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Hassan Khodja R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hauber E.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Hauber E.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hauber E.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Hauber E.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Hauber E.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Hauber E.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Hauber E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hauck S. A. II  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Hauri E. H.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Hauseth E.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Hauseth E. M.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hauseth E. M. *  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Hauver K. L.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Hawke B. R.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Hawke B. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Hawke B. R.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Hawke B. R.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Hawke B. R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hawke B. R.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Hayabusa-2 Mid-Infrared Imager Team  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hayden L. A.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Hayes A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Hayes A.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Hayes A. G.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Hayes A. G.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Hayne P. O.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Hayne P. O.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Hayne P. O.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Hays N. R.  Print Only: Mars
Hayward R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Hayward R. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Hayward R. K.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
He Q.  Print Only: Mars
He S.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Head J.  Mercury, Mon, p.m., Waterway Ballroom 1
Head J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Head J. III  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Head J. W. * Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Head J. W.  Martian Ground Ice Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Head J. W.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Head J. W.  Thermal and Migmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Head J. W.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Head J. W.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Head J. W.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Head J. W.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Head J. W.  Lunar Datasets Posters, Thu, p.m., Town Center Exhibit Area
Head J. W. III Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Head J. W. III  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Head J. W. III* Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Head J. W. III  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Head J. W. III  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Heather D.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Heber V.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Heber V. S.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Heber V. S. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Hecht L.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Hecht M. H.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Hecht M. H.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Heck P. R.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Heck P. R.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Heck P. R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Heck P. R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Heck P. R.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Heggy E.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Heggy E.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Heggy E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hegyi S.  EPO Undergraduate Education Posters, Tue, p.m., Town Center Exhibit Area
Heineck J. T.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Heinick J. T.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Helbert J.  Mercury, Mon, p.m., Waterway Ballroom 5
Helbert J.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Helbert J.  Mercury Posters, Tue, p.m., Town Center Exhibit Area

42nd LPSC Program Index  277
Helbert J.  
Venus, Wed, p.m., Montgomery Ballroom

Helbert J.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Heldmann J.  
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area

Heldmann J.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Heldmann J. L.  
Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area

Heldmann J. L.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Helfenstein P.  
Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area

Helfenstein P.  
Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area

Helper M.  
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area

Helper M. A.  
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area

Helz R. T.  
Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area

Hemley R. J.  
Impacts II Posters, Tue, p.m., Town Center Exhibit Area

Henderson M. A.  
EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area

Hendrix A.  
Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6

Hendrix A. R.  
Small Bodies, Mon, a.m., Waterway Ballroom 5

Hendrix A. R.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Henke S.  
Print Only:  Small Bodies

Henkel T.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Henkel T.  
Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4

Henry H.  
EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area

Hensley S.  
Titan Everything Posters, Tue, p.m., Town Center Exhibit Area

Hensley S.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Hepplewhite P. D.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Hercigonja T.  
Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area

Herd C. D. K.  
Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area

Herd R. K.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Herkenhoff K.  
Special Session:  Cryospheres III, Tue, p.m., Waterway Ballroom 1

Herkenhoff K.  
Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area

Herkenhoff K. E.  
Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area

Herkenhoff K. E.  
Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area

Herkenhoff K. E.  
Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area

Herkenhoff K. E.  
Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area

Hermalkyn B. *  
Special Session:  Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5

Herrick R. R.  
Mercury Posters, Tue, p.m., Town Center Exhibit Area

Herrick R. R.  
Venus Posters, Tue, p.m., Town Center Exhibit Area

Herrick R. R.  
Mars Sediments, Wed, a.m., Waterway Ballroom 1

Herrick R. R.  
Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area

Herrin J.  
Vesta and HEDs, Fri, a.m., Waterway Ballroom 5

Herrin J. S.  
Achondrites, Mon, p.m., Waterway Ballroom 4

Herrin J. S.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Herrin J. S.  
Vesta and HEDs, Fri, a.m., Waterway Ballroom 5

Herrmann B. C.  
Impacts II Posters, Tue, p.m., Town Center Exhibit Area

Herrmann S.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Herrmann S.  
Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area

Herrmann S.  
Vesta and HEDs, Fri, a.m., Waterway Ballroom 5

Hervig R.  
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area

Hervig R.  
SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area

Hertog G.  
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area

Hertog G.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Hertog G. F.  
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area

Hertog G. F.  
Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area

Hertog G. F.  
Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area

Hertog G. F.  
Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area

Hertog G. F.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Hess P. C.  
Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6

Hewins R.  
Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Hewins R. H.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Heyd R.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Heylman K. D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Hezel D. C.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Hezel D. C.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Hezel D. C.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Hibbard K.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Hibberd J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hibbitts C. A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Hibbitts C. A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hibbitts C. A.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Hibbitts C. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hibbitts C. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hicks D. G.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Hicks L. J. * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Hicks M.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Hicks M. D.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Hicks T.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Hiermaier S.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Hiesinger H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Hiesinger H.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Hiesinger H.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Hiesinger H.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hiesinger H.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Hiesinger H. * Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Hiesinger H.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Hiesinger H.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Hiesinger H.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Higgins M. D. * Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Higgins M. D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Hildebrand A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Hill D. H.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Hill K. S.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Hill K. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hill L. D.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Hiller J.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Hiller J.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Hillgren V. J.  Mercury, Mon, p.m., Waterway Ballroom 1
Hillgren V. J. * Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Hillier J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Hillier J.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Hillier J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Hillier J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Hills H. K.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Hiltl M.  Print Only: Cosmochemistry Print Only
Hines R.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Hipkin V. J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hirai T.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Hirata N.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Hirata N.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Hirata N.  Data Tools, Access, and Archiving Posters, Thu, p.m., Town Center Exhibit Area
Hirata N. * Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Hirata N.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Hirata N. H.  Print Only: Outer Solar System
Hirai K.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>HiRISE Science Team</th>
<th>Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiRISE Team</td>
<td>Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Hiroi T. *</td>
<td>Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hiroi T.</td>
<td>Vesta and HEDs, Fri, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Hironaka Y.</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Hirschmann M. M. *</td>
<td>Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Hirtzg M.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hö N.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hochleitner R.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodges K.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodges K. V.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodges K. V.</td>
<td>Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Hodges K. V.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodgson E.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodys R.</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hodys R. P.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoerth T.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoerth T. *</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Hoffman E. J.</td>
<td>Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoffman S. J.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoffmann B.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoffmann V. H.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoffmann M.</td>
<td>Print Only: Cosmochemistry Print Only</td>
</tr>
<tr>
<td>Hogan P.</td>
<td>EPO Moon Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hogenboom D. L.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hohenberg C. M.</td>
<td>Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hohenberg C. M.</td>
<td>Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hohenberg C. M.</td>
<td>Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Höink T. *</td>
<td>Venus, Wed, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Holden J. F.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Holin I. V.</td>
<td>Print Only: Mercury</td>
</tr>
<tr>
<td>Hollister L.</td>
<td>Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holloway T. A.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holm N. G.</td>
<td>Print Only: Exobiology</td>
</tr>
<tr>
<td>Holm S.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holohan E. P.</td>
<td>Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holsapple K. A.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holsapple K. A.</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Holselaw G. M.</td>
<td>Mercury Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Holt J. W. *</td>
<td>Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Holt J. W.</td>
<td>Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Homolya E.</td>
<td>Print Only: Education and Public Outreach</td>
</tr>
<tr>
<td>Honda C.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Honda M.</td>
<td>Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Honda R.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hong J. K.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hong J. W.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hong S. G.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hood L. L.</td>
<td>Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hopkins M.</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Hopkins M.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hopkins M.</td>
<td>Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hopp J.</td>
<td>SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hoppe P. *</td>
<td>Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4</td>
</tr>
</tbody>
</table>
Hoppe P.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Hoppe P.  Dusty Horizons II Posters, Thu, p.m., Waterway Ballroom 4
Hoppe P.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Hoppe P.  Print Only:  Differentiated Meteorites
Horan M. F.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Horanyi M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Hoppe P.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Horanyi M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Horányi M.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Horgan B.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Howald T. V.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Howell E. S.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Hu J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Hu J.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Hu J.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Hu Z. W.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Huang D.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Huang Q.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Huang Q.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Housen K. R.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Housen K. R.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Hovius N.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Howald T. V.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Howard A. D. *  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Howard A. D.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Howard A. D.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Howard A. D.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Howard A. D.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Howard A. D. *  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Howard K. T.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Howard K. T.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Howard L.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Howard L.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Howe C.  Print Only: Missions, Instruments, and Payload Concepts
Howe K. L.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Howell E. S.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Hsu B. C. *  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Hsu W.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Hsu W.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Huang H.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Huang L.-C.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Huang Q.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Huang Q.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Huang S. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Huang S. Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Hubbard B. Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Huber L. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Huber M. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Huber M. S. Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Huber M. S. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Hübers H.-W. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Huberty J. M. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hudson B. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Hudson T. L. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Huebner W. F. Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Huertas A. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Huertas A. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Huertas A. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Huff S. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hughes A. C. G. * Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Hughes A. L. H. Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Hughes C. G. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Hui H. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Humayun M. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Humayun M. Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Humayun M. Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Humayun M. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Humayun M. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Humayun M. Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Humayun M. * Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Humm D. C. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Humphries S. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Humphries S. D. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Humphries S. D. Venus Posters, Tue, p.m., Town Center Exhibit Area
Humphries S. D. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Hunt A. C. Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Hunt S. A. Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Hupé G. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Hurford T. A. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Hurford T. A. Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Hurley D. M. * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Hurley D. M. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Hurwitz J. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Hurwitz J. A. Mars Alteration, Wed, p.m., Waterway Ballroom 1
Hurwitz J. A. * Exobiology I, Thu, a.m., Waterway Ballroom 1
Hurwitz J. A. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Hurtado J. M. Jr. Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Hurtado J. M. Jr. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hurwitz D. M. * Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Huss G. R. Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Huss G. R. Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Huss G. R. Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Huss G. R. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Huss G. R. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Huss G. R. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Huss G. R. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Hussain M. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Hutcheon I. D. Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Hutcheon I. D. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Hutchinson I. B. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Hutchinson J. A. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Hutchinson J. A. Early Solar System II Posters, Thu, p.m., Town Center Exhibit Area
Hutchinson J. A. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Hutchinson J. A. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Hutchinson J. A. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Hutson M. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Hutson M. L. EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Date</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Huybers P.</td>
<td>Cryosphere: Icy Insights Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Huyksens M.</td>
<td>Achondrites, Mon.</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Hvild S. F.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hvild S. F.</td>
<td>Mars Alteration</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Hyde T. W.</td>
<td>Cosmochemical Origins I</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Hyde T. W.</td>
<td>Cosmochemical Origins I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hyde T. W.</td>
<td>Titan Everything Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hynek B. M.</td>
<td>Impacts: Modeling and Remote Sensing</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Hynek B. M.</td>
<td>Mars Alteration</td>
<td>Wed</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Hynek B. M.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Hynes K. M.</td>
<td>Unraveling the Origins of Presolar Grains</td>
<td>Tue</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Iagnemma K.</td>
<td>Mars Rovers and Landers Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ichikawa S.</td>
<td>Dusty Horizons I Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ichimura A. S.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Ida S.</td>
<td>Impacts I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Igel C.</td>
<td>EPO Scientist Engagement Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Iijima Y.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Iizuka T.</td>
<td>Achondrites, Mon.</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Illés E.</td>
<td>Print Only: Education and Public Outreach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illés-Almár E.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Imamura T.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ip W.-H.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ip W.-H.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ipato S. I.</td>
<td>Small Bodies Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ireland T.</td>
<td>Early Solar System I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ireland T. J.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ireland T. R.</td>
<td>Special Session: Results from Hayabusa!</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Ireland T. R.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Ireland T. R.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Achondrites, Mon.</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Irving A.</td>
<td>Cosmochemical Origins II</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Iron Meteorites and Pallasites Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Lunar Crust Samples Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Irving A.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Irving A.</td>
<td>Vesta and HEDs</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Irving A.</td>
<td>From Mantle to Crust</td>
<td>Fri</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Irwin R. P. III*</td>
<td>Mars Sediments</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Irwin R. P. III</td>
<td>Mars Data Analysis Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isa J.</td>
<td>Early Solar System II Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isa M.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isaacson P.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isaacson P.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isaacson P. J.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isaacson P. J.</td>
<td>Samples and Spectroscopy Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isaacson P. J. *</td>
<td>Composition of the Lunar Crust</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Isaacson P. J.</td>
<td>Lunar Impacts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isachsen C. E.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isachsen C. E.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isheim D.</td>
<td>Unraveling the Origins of Presolar Grains</td>
<td>Tue</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Isheim D.</td>
<td>Presolar Grains Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Isherwood R. J.</td>
<td>Igneous Processes Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ishibashi K.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ishibashi Y.</td>
<td>Early Solar System I Posters</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Ishibashi Y.</td>
<td>Special Session: Results from Hayabusa!</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
</tbody>
</table>
Ishida H.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ishiguro M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ishihara Y.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Ishihara Y.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Ishihara Y.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Ishihara Y.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ishihara Y. I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ishihara Y.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Ishii H. A.  Print Only: Interplanetary and Presolar Dust
Ishihara Y.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Ishihara Y.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ishihara Y. I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ishihari Y.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Ishii H. A.  Print Only: Interplanetary and Presolar Dust
Ishimaru R. *  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Islam R.  Mars: Terrestrial Analogs Posters, Thu, p.m., Town Center Exhibit Area
Islam R.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Ismail S.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
ISSI ILD Team  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Ito M.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Ito M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Ito S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Itoh S.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Ito S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ivanov A.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Ivanov A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ivanov B. A.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Ivanov B. A.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Ivanov M. A.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Ivanova M. A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Ivanova M. A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Ivanova M. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ivanova M. A.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Jacobsen S. B.  Print Only: Interplanetary and Presolar Dust
Jacobsen S. B.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Ivashchenko Yu. N.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Ivey D. M.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Iwai T.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Iwasaki A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Iwata T.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Iwata T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Iwata T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Iwata T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Izawa M.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Izawa M. R. M.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Izawa M. R. M.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Izawa M. R. M.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Izawa M. R. M.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Izawa M. R. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Izenberg N.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Izenberg N. R.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Jabeen I.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Jackson A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Jackson T.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Jackson T. L.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Jackson T. L.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Jackson T. L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Jackson T. L.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Jackson W. A.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Jacob D.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Jacobsen B.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Jacobsen C.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Jacobsen S. B.  Print Only: Interplanetary and Presolar Dust
Jacobsen S. B.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Day, Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jacobsen S. B.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jacobsen S. B.</td>
<td>Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jacobsen S. D.</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jacobson S. J.</td>
<td>Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Jacquet E. *</td>
<td>Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jadhav M.</td>
<td>Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jadhav M.</td>
<td>Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jaeger W. L.</td>
<td>Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>James O. B.</td>
<td>Lunar Impacts I, Fri, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>James P. B.</td>
<td>Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>James P. B.</td>
<td>Venus Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jamieson C. S.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jamieson C. S.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jamieson C. S.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jarno W.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jamsja N.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jänchen J.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Janle P.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Janney P. E.</td>
<td>Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Janney P. E.</td>
<td>Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Janney P. E.</td>
<td>Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jao J.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jaramillo-Botero A</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jarit S. J.</td>
<td>Terrestrial Impact Craters, Thu, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Jarit S. J.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jaumann R.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jaumann R.</td>
<td>Mars Sediments, Wed, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Jaumann R.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jawin E. R.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jellinek M.</td>
<td>Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Jennings D.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jenniskens P.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Jenniskens P.</td>
<td>Achondrites, Mon, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jensen E. A. *</td>
<td>Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Jensen H. B.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jeremicno M. J.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jerman G. A.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jessberger E. K.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>JET Team</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jieffel P. W.</td>
<td>Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jiang J.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jilly C. E.</td>
<td>Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Jilly C. E.</td>
<td>Cosmochemical Origins II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jilly C. E.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jodlowski P.</td>
<td>Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jodlowski P.</td>
<td>Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Jogo K.</td>
<td>Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Jogo K. *</td>
<td>Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Johansson H. A. B.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johansson L.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson B. C. *</td>
<td>Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Mercury Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson C. L.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson C. S.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson D.</td>
<td>SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson J. A.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson J. R.</td>
<td>Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Johnson J. R.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Johnson J. R.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Johnson K. N.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Johnson K. N.  * Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Johnson M. D.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Johnson N. M.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Johnson N. M.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Johnson P. V.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Johnson R. C.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Johnson R. E.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Johnson T.  Print Only: Planetary Atmospheres
Johnson T. V.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Johnson T. V.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Johnson T. V.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Johnsson A.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Johnsson A.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Jolliff B. L.  * Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Jolliff B. L.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Jolliff B. L.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Jolliff B. L.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Jolliff B. L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Jolliff B. L.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Jolliff B. L.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Jolliff B. L.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Jolliff B. L.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Jolliff B. L.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Jolliff B. L.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Jolliff B. L.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Jolliff B. L.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Jolliff B. L.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Jones A.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Jones A. J. P.  * Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Jones A. P.  Achondrites, Mon, p.m., Waterway Ballroom 4
Jones A. P.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Jones B. A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Jones E.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Jones G. H.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Jones J.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Jones J. H.  * Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Jones J. H.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Jones J. H.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Jones K. W.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Jones R. H.  * Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Jones R. H.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Jones R. H.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Jones T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Jorge M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
José J.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Joseph E. C. S.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Joseph E. C. S.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Josse L.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Joswiak D.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Joswiak D.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Joswiak D. J.  * Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Jouannic G.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Jouannic G.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Joy K. H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Joy K. H.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Joy K. H.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Joy K. H.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Joy K. H.  * Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Joy S. P.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Józsa S.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Jozwiak L. M.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Jull A. J. T.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Jurdy D. M.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Jurewicz A. J. G.  Early Solar System I Posters, Thu, p.m., Town Center Exhibit Area
Jurewicz A. J. G.  Early Solar System II Posters, Thu, p.m., Town Center Exhibit Area
Jurewicz A. J. G.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Jutzi M.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Jutzi M.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Kabai S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kadish S. J.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Kadish S. J.  Cryosphere: Icy Insights Posters, Thu, p.m., Town Center Exhibit Area
Kadish S. J.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Kadono T.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Kadono T.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Kagitani M.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Kaguya Gamma Ray Spectrometer Team  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Kah L. C.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Kah L. C.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Kahharov B. B.  Print Only: Moon
Kahn E. G.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Kaiden H.  Print Only: Cosmochemistry Print Only
Kakuma H. K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kalimina G. V.  Print Only: Moon
Kalwoda M.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Kaltenbach A.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Kalynn J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Kamata S. *  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Kamedu S.  Mercury Posters, Thu, p.m., Town Center Exhibit Area
Kamedu S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kamp L. W.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Kamp L. W.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Kanik I.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kanik I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Karamyan G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Karatekin O.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Kargel J. S. *  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Kargel J. S.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Kargel J. S.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Karimov A. M.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Karlstrom L.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Karouji Y.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Karouji Y.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Karouji Y.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Karouji Y.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Karouji Y.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kasai Y.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Kasama T.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Kascak A.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Kaseti P. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Kashkarov L. L.  Print Only: Cosmochemistry Print Only
Kashkarov L. L.  Print Only: Moon
Kasper J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Kasprzak W.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kasprzak W. T.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Kataoka K.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Kataoka K.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Katayama I.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Kater L.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Katsura T.  Print Only: Small Bodies
Kattenhorn S. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Kattenhorn S. A.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Location</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kattenhorn S. A. *</td>
<td>Coldmember: Icy Ocean Worlds</td>
<td>Fri, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kaufmann D.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Kaufmann D. E.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kaur P.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kawaguchi J.</td>
<td>Early Solar System I Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kawaguchi J.</td>
<td>Special Session: Results from Hayabusa!</td>
<td>Thu, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Kawakita H.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kay J. P. *</td>
<td>Mini-Mimas</td>
<td>Thu, p.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Kay J. P.</td>
<td>Coldmember: Icy Ocean Worlds</td>
<td>Fri, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kayama M.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kaydash V.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaydash V. G.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keane J.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kearsley A.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Kearsley A.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kearsley A. T.</td>
<td>Impact Experiments</td>
<td>Wed, a.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Kearsley A. T.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Kearsley A. T.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kebukawa Y.</td>
<td>Organics and Volatiles in Chondritic Meteorites Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keil P.</td>
<td>Impacts II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keiser L.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keller H. U.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keller J. W. *</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Keller J. W.</td>
<td>Moon Missions and Samples Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keller L. P.</td>
<td>Asteroid Geophysics and Processes</td>
<td>Mon, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Keller L. P. *</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Keller L. P.</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Keller L. P.</td>
<td>Primitive Meteorites II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keller L. P.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kellett B. J.</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kelley M. S.</td>
<td>Asteroid Studies Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kelley M. S.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I</td>
<td>Wed, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kelley M. S.</td>
<td>Small Bodies Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kelley R.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kelley S. P.</td>
<td>EPO Moon Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kelly D.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kempf S.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kempf S.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kenkmann T.</td>
<td>Impacts I Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kenkmann T.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kenkmann T. *</td>
<td>Impact Experiments</td>
<td>Wed, a.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Kenkmann T.</td>
<td>Geology of Martian Impact Craters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kennedy M.</td>
<td>Impacts: Modeling and Remote Sensing</td>
<td>Tue, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kent B. H.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kerber L.</td>
<td>The Medusae Fossae Formation Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kerber L.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kerby J.</td>
<td>Impacts I Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kereszturi A.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kereszturi A.</td>
<td>Print Only: Education and Public Outreach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kereszturi A.</td>
<td>Seasonal Ice Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kereszturi A.</td>
<td>EPO Undergraduate Education Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kervyn M.</td>
<td>Igneous Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keska A. L.</td>
<td>Impacts: Modeling and Remote Sensing</td>
<td>Tue, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Kestay L.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kestay L.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kestay L.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Keszthelyi L. P.</td>
<td>Volcanism in the Outer Solar System Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>KGRS Team</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Khartitonova G. A.</td>
<td>Giant Planets and Rings Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Khartov V. V.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Kharytonov A.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Kidd R.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kiefer B.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Kiefer W. S.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Kiefer W. S.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Kiefer W. S. *  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Kiefer W. S.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Kiefer W. S. *  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Kienlenberger R. L.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kikuchi F.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Kikuchi F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kilcoyne A. L. D.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Kilcoyne A. L. D.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Kilcoyne A. L. D.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Killeen K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Killen R. M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Killgore M.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Kim H.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kim J.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Kim J.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Kim JR.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Kim J-R.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Kim K. J.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Kim O.-S.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kim YH.  Moon Apollo-Lunokhod Legacy Posters, Thu, p.m., Town Center Exhibit Area
Kimberley J.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Kimura H.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Kimura J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Kimura M.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Kimura M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Kimura M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Kimura Y.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
King A.  *  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
King A. J.  Dusty Horizons II Posters, Thu, p.m., Waterway Ballroom 4
King A. J.  Dusty Horizons Posters, Thu, p.m., Town Center Exhibit Area
King D. T.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
King D. T. Jr.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
King D. T. Jr.  Print Only: Impacts
King P. L.  Mars Sediments, Mon, a.m., Waterway Ballroom 5
King P. L.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
King P. L.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
King P. L.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
King P. L.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
King S. D.  Venus Posters, Tue, p.m., Town Center Exhibit Area
King S. D.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Kinnison D. E.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Kipp D.  Mars Rovers and Landers Posters, Thu, p.m., Town Center Exhibit Area
Kipp D.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Kiran Kumar A. S.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Kiran Kumar A. S.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Kiran Kumar A. S.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Kirby K. W.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Kirchoff M. R. *  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Kirienko G. A.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Kirk R.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Kirk R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Date, Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirk R.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Mars Rovers and Landers Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Titan Everything Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Volcanism in the Outer Solar System Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Mars Data Analysis Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirk R. L.</td>
<td>Moon Datasets Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kirsimäe K.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kiss D.</td>
<td>EPO High School Research/Competition Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kissel J.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies I</td>
<td>Wed, a.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Kita N. T.</td>
<td>Achondrites, Mon.</td>
<td>p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Kita N. T.</td>
<td>Early Solar System II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kita N. T.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Kita N. T.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kitajima F.</td>
<td>Special Session: Results from Hayabusa!</td>
<td>Thu, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Kitazato K.</td>
<td>Asteroid Discovery Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kitazato K.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kitazato K.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kite E. S.</td>
<td>Mars Sediments</td>
<td>Wed, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Kitts C.</td>
<td>Exobiology Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klaasen K.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Klaus K.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kleine T.</td>
<td>Print Only: Small Bodies</td>
<td></td>
</tr>
<tr>
<td>Kleine T.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Kleine T.</td>
<td>Early Solar System I Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kleine T.</td>
<td>Early Solar System Reservoirs</td>
<td>Wed, a.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Kleine T.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Kleinmans M. G.</td>
<td>Martian Fanclub Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kleinmans M. G.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kleinschrodt R.</td>
<td>Primitive Meteorites I Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klem</td>
<td>Thermal and Magmatic Evolution Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kleiner-Pack S.</td>
<td>Early Solar System Reservoirs</td>
<td>Wed, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Klima R.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klima R. L.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Klima R. L.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klima R. L.</td>
<td>Samples and Spectroscopy Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klima R. L. *</td>
<td>Composition of the Lunar Crust</td>
<td>Wed, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Klima R. L.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klingelhofer G.</td>
<td>Materials Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Klingelhofer G.</td>
<td>Mars Alteration</td>
<td>Wed, p.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Klingelhofer G.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Knack Jensen S.</td>
<td>Field and Laboratory Analogs Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kneissl T.</td>
<td>Martian Layered Deposits Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kneissl T.</td>
<td>Mars Alteration Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Knie K.</td>
<td>Lunar Crust Samples Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Knight M. M. *</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Knollenberg J.</td>
<td>Asteroid Photogeology Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Knutson J. K.</td>
<td>Exobiology II</td>
<td>Thu, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Kobayashi H.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II</td>
<td>Wed, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Kobayashi M.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi M.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi M.-N.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi N. K.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi N. K.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Formation and Evolution of the Moon II</td>
<td>Tue, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Planetary Differentiation Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi S.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Kobayashi T.</td>
<td>Atmospheres: Observations and Processes Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Kobie B. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kobzeff P. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kochasov G. G. Print Only: Small Bodies
Kodama T. K. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kodolanyi J. Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Koeberl C.* Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Koeberl C. Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Koeberl C. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Koechler J. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Kogure T. Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Kohlstedt D. L. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Kohout T. Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Kohout T. Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Kokorowski M. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kokubo E. Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Kolb E. J. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Komatsu G. Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Komatsu G. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Komatsu G. Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Komatsu M. Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Kondratieva A. V. Print Only: Outer Solar System
Konen M. Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kong F. J. Exobiology I, Thu, a.m., Waterway Ballroom 1
Kong W. G. Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Kong W. G. Exobiology I, Thu, a.m., Waterway Ballroom 1
Koniecek A. R. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Konno M. Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Kononkova N. N. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Kononkova N. N. Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Konopliv A. S. Print Only: Missions, Instruments, and Payload Concepts
Konovalova N. A. Print Only: Small Bodies
Kopstein M. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Korda D. T. Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Korochantsev A. V. Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Korochantsev A. V. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Korochentseva E. V. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Korokhin V. V. Print Only: Moon
Korokhin V. V. Print Only: Planetary Atmospheres
Korotev R. L. Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Korotev R. L. Thermal and Migmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Korotev R. L. Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Korotev R. L.* Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Korschinek G. Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Korschinek G. Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Kortencamp S. J. EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Korteniemi J. Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Kortenkamp S. J. Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Korth H. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Korycansky D. G. Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Korycansky D. G. Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Koschny D. Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Koschny D. V. Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Kosmo J. J. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kostama V.-P. Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Kostama V.-P. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Koster A. M. Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Kotzen P. Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Kotler M. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Kotsugi M. Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Kounaves S. P. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kounaves S. P. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Kozhukhov A. M. Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Kozlova E. A.  Print Only: Moon
Kozyrev A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Kozyrev A. S.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Kozyrev A. S.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Kozyrev A. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kraal E.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Kraal E. R.  Print Only: Mars
Krafl M. D.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Kramer G.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Kraus R. G. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Krause M.  Print Only: Small Bodies
Krawczynski M. J. * Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Kreslavsky M. A.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Kreslavsky M. A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Kreslavsky M. A.  Venus, Wed, p.m., Montgomery Ballroom
Kreslavsky M. A. * Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Krestina N.  Print Only: Interplanetary and Presolar Dust
Krimigis S. M.  Mercury, Mon, p.m., Waterway Ballroom 1
Kring D. A. * Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Kring D. A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Kring D. A.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Kring D. A.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Kring D. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Kring D. A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Kring D. A.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Kring D. A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Kring D. A.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Kring D. A.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Kring D. A.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Kring D. A.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Krishna Sumanth T.  Print Only: Moon
Krishna Sumanth T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Krofp A. * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Krot A.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Krot A. N.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Krot A. N.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Krot A. N.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Krot A. N.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Krot A. N. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Krot A. N.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Krot A. N.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Kruijer T. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Kruzellecky R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kryssak D. J.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Kuan Y.-J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Kubota S.  Planetary Mission Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kubuki S.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Kuebler K. E.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Kuehner S. M.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Kuehner S. M.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Kuehne S. M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Kuehne S. M.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Kuehne E.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Kueppers M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Kuhlman K. R.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Kuhlmann L.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Kühn H.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Kuhnke M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Kukkonen S.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Kulkarni R.  Print Only: Missions, Instruments, and Payload Concepts
Kumagai K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Kumar  Print Only: Missions, Instruments, and Payload Concepts
Kumar P. S.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Kumar P. S.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Kunimaka H.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Kunkel T. S.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Kuramoto K.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Kurita K.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Kurita K. K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Kuriyama Y.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Kurokawa H.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Kurosawa K.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Kurosawa K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Kurihara T.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Kurita K.  Spring Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Kushiro I.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Kvaratskhelia O. I.  Print Only: Moon
Labasse D.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Lacele D.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
LaConte K.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Lai B.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Lai B.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Lajunesse P.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Lal D.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Lal D. *  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Lambert J.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Lammel S.  Print Only: Moon
Lamy P.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Landis R.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Landman N. H.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Landsman W. B.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Lane M. D.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Lane M. D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Lane S.  Print Only: Mars
Laneuville M.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Laneuville M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Lang A.  EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Lang N.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Lang N. P.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Langenhorst F.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Langvein Y.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Langhans M.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Lantukh D. V.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lanza N. L.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Lanzirotti A.  Print Only: Igneous Processes
Lanzirotti A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Lanzirotti A.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Lanzirotti A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lapen T.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Lapen T. J.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Lapen T. J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Lapen T. J.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Lapen T. J.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Lapen T. J.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Lara L. M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Larsen J. A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Event Title</th>
<th>Day</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lasnik J.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lasue J.</td>
<td>Special Session: Cryospheres II, Tue, a.m.</td>
<td>Tue</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Lasue J.</td>
<td>Mars Instruments Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lasue J.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lasue J. A.</td>
<td>Mars Instruments Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lasue J. A.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Laubenstein M.</td>
<td>Primitive Meteorites I Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Launeau P.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lauretta D. S.</td>
<td>Early Solar System II Posters, Tue, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lauretta D. S.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lauretta D. S.</td>
<td>Planetary Differentiation, Thu, a.m.</td>
<td>Thu</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Lauretta D. S.</td>
<td>Primitive Meteorites II, Fri, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Lavrentjeva Z. A.</td>
<td>Print Only: Cosmochemistry Print Only</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Law P.</td>
<td>Primitive Meteorites II Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawder M. T.</td>
<td>The Dust Bin Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Special Session: Cryospheres I, Mon, a.m.</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Mercury, Mon, p.m.</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Mercury Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Lunar Crust Remote Sensing Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence D. J.</td>
<td>Moon Remote Sensing Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence K. J.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence K. P.</td>
<td>Atmospheres: Observations and Processes Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence S.</td>
<td>Lunar Impacts Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence S. J.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Lawrence S. J.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence S. J.</td>
<td>Materials Analogs Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lawrence S. J.</td>
<td>The Dust Bin Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lazarev E. N.</td>
<td>Print Only: Moon</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lazzarin M.</td>
<td>Asteroid Photogeology Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lazzaro D.</td>
<td>Small Bodies, Mon, a.m.</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Lazzaro D.</td>
<td>Asteroid Studies Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le L.</td>
<td>Carbon on Mars, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le L.</td>
<td>Early Solar System Reservoirs I, Wed, a.m.</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Le L.</td>
<td>Composition of the Lunar Crust, Wed, a.m.</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Le L.</td>
<td>Primitive Meteorites II Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le L.</td>
<td>Igneous Processes Posters Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Bars M. *</td>
<td>Formation and Evolution of the Moon I, Mon, p.m.</td>
<td>Mon</td>
<td>p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Le Corre L.</td>
<td>Mars Sediments, Wed, a.m.</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Deit L.</td>
<td>Martian Layered Deposits Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Deit L.</td>
<td>Mars: Terrestrial Analogs Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Deit L.</td>
<td>Mars Sediments, Wed, a.m.</td>
<td>Wed</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Deit L.</td>
<td>Acid vs. Alkaline, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Gall A.</td>
<td>Special Session: Cryospheres II, Tue, a.m.</td>
<td>Tue</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Gall A.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Gall A.</td>
<td>Planetary Dynamics and Tectonics Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Guillou C. *</td>
<td>Early Solar System Reservoirs III, Fri, a.m.</td>
<td>Fri</td>
<td>a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Le Mouëllic S.</td>
<td>Special Session: Cryospheres I, Mon, a.m.</td>
<td>Mon</td>
<td>a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Mouëllic S.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Mouëllic S.</td>
<td>Titan Everything Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Le Mouëllic S.</td>
<td>Acid vs. Alkaline, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Le Mouëllic S.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Leach J. H. J.</td>
<td>Venus Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Leach J. H. J.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m.</td>
<td>Thu</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lebofsky L. A.</td>
<td>Education and Public Outreach, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Lebofsky L. A.</td>
<td>EPO Meteorites Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lebofsky L. A.</td>
<td>EPO K–12 Resources Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Lebonnois S.</td>
<td>Atmospheres: Observations and Processes Posters, Tue, p.m.</td>
<td>Tue</td>
<td>p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Lebron-Rivera S. A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Lebsack E.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Ledvina L.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Leitner J.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Lee B. Y.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Lee C.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Lee C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lee C.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Lee C. B.  Print Only: Mars
Lee C.-T. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Lee E.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Lee J. I.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Lee J. I.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Lee J.-E.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Lee M. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Lee M. R.  Achnorrites, Mon, p.m., Waterway Ballroom 4
Lee M. R.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Lee M. R.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Lee M. R.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Lee P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lee P.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Lee P.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Lee R. J.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Lee T. *  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Lee Y. K.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Leeman J. R.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Lees D.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
LeFèvre F.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Lefort A.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
LeGall A.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
LeGall A.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Lehmann B.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Lehner S. W.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Lehner S. W.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Lehner S. W.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Leinenweber K.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Leinhardt Z. M.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Leitner J.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Leitner J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Leitner J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Leitner J.  Organic and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Lemelle L.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Lemoine F. G.  Print Only: Missions, Instruments, and Payload Concepts
Lemoine F. G.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Lena R.  Print Only: Moon
Lenardic A.  Venus, Wed, p.m., Montgomery Ballroom
Lenferink H. J. *  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Lennon A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Leonard A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Leonard A. A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Leoni L.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Leovy C. B.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Lepinette A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Lepinette A.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Lepland A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Lepri S.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Leroux H.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Leroux H.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Letchford J. K.  Mars Rovers and Landers Posters, Thu, p.m., Town Center Exhibit Area
Lettieri R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Lettieri R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Leverington D. W.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Levine J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Levine J. S.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Levison H. F.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Levison H. F.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Levy J. S.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Levy J. S. *  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Levy J. S.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Lewellen D. C.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Lewis K. W.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Lewis L. R.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Lewis R. S.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Lewis R. S.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Leya I.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Leya I.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Leya I.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Li C.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Li C. L.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Li J. *  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Li J.-Y.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Li J.-Y.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Li J.-Y. *  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Li J.-Y.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Town Center Exhibit Area
Li J.-Y.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Li L.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Li Q. L.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Li Q.-L.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Li Q.-L.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Li R.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Li R.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Li R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Li R.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Li S.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Li X. H.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Li X.-H.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Li X.-H.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Li Y.  Print Only: Moon
Lian Y.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Liang Q.  Print Only: Moon
Liang Y.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Libourel G.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Libourel G.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Licandro J.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Licht A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Lienert B. R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Likhanskii A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Lilje A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Lillis R. J.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Lillis R. J.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Lim D. S. S.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Lim L.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lim L. F.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Lin B. E.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Lin P.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Lin S.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Lin S.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Lin SH.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Lin T. J.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Lin Y.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Lindemann R.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Lindgren C.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Lindgren P. *  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Lindgren P.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Lindler D.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Lindsay F.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Lindsay F. N.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Lindley D. H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Ling Z. C.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Ling Z. C.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Lintott C.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Lipman M. D.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Lipman M. D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Lippi M.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Lira C.  Print Only: Mars
Lira C.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Lisse C. M.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Lisse C. M. *  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Lisse C. M.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Lisse C. M.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Litherland M. M.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Litvak M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Litvak M. L.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Litvak M. L.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Litvak M. L.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Litvak M. L.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Litwin K. L.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Liu B.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Liu C.-Y.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Liu J. J.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Liu J. Z.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Liu N.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Liu W.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Liu Y.  Achondrites, Mon, p.m., Waterway Ballroom 4
Liu Y.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Liu Y.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Liu Y.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Liu Y.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Liu Y.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Liu Z.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Liu Z. Y. C.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Locat J.  Print Only: Small Bodies
Locat J.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Lockhart M.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Lockyer N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lofgren G.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Lofgren G. E.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Lofgren G. E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Loftus D. J.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Logan M. A. V.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Lognonne P.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Loizeau D.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Loizeau D.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
LOLA Science Team  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Loncaric S.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Loncaric S.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Loncaric S.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Loncaric S.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Longobardo A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Looper M. D.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Lopes R.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lopes R.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Lopes R.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Lopes R. M.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Lopes R. M. C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lopes R. M. C.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
López C.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
López G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lopez-Moreno J. J.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Lorenz C. A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Lorenz C. A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Lorenz C. A.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Lorenz C. A.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Lorenz R. D.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lorenz R. D.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Lorenz R. D.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lorenz R. D.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Losert W.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Losiak A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Losiak A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Lough T. A.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Lousada M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Love S. G.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Lowe D.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Lowe D.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Lowell R. P.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Lowes L. L.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Lowman P. D.  Moon Apollo-Lunokhid Legacy Posters, Tue, p.m., Town Center Exhibit Area
LROC Science Operation Team  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
LROC Science Team  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
LROC Science Team  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
LROC Science Team  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
LROC Science Team  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
LROC Science Team  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
LROC Science Team  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
LROC Team  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
LROC Team  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
LROC Team  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
LROC Team  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
LROC Team  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
LROC Team  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Lu Y.  Print Only: Moon
Lubala F. R. T.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Lucchitta B. K.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Lucey P. G. *  Mercury, Mon, p.m., Waterway Ballroom 1
Lucey P. G.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Lucey P. G.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Lucey P. G.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Lucey P. G.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Lucey P. G.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Lucey P. G.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Lucey P. G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Luckey M.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Lucks M.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Lugmair G. W.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Lundeen S.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Lundeen S. R.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Lundy M.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Lunette Team  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lunine J. I.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lunine J. I.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lunine J. I.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Lunine J. I.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Lunine J. I.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Lunine J. I.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Lunine J.  Print Only: Planetary Atmospheres
Lunine J. I.  Print Only: Outer Solar System
Lunning N.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Lunsford A.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Luo B.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Luo W.  Mars: Terrestrial Analog Posters, Tue, p.m., Town Center Exhibit Area
Luo W. *  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Luo Z.-H.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Lupsay-Kuti A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Luspay-Kuti A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Lustrement B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lyu Tu. H.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Luzia F.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Ly S.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Lynch K. L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Lyness E.  Print Only: Mars
Lyness E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Lyon I. C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Lyon I. C.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Lyons J. R. *  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Lyons J. R.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Lyverse P.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
M' Team  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
M' Team  Moon Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
M' Team  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
M' Team  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Ma C.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Ma C.  Early Solar System Reservoirs II, Wed, a.m., Waterway Ballroom 4
Ma C.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Ma P.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Ma Q.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
MacGregor J. A.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Machado A.  Print Only: Mars
Machado A.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Machida M. N.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Machit N.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Macke R. J.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Mackety D.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
MacInnes E. M.  Martain Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
MacPherson G. J.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
MacPherson G. J.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
MacPherson G. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
MacPherson G. J.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Madeleine J.-B.  Special Session: Cryospheres I, Mon, a.m., Waterway Hallroom 1
Madeleine J.-B.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Maden C.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Maden C.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Maden C.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Mader M.  Environmental Analog Posters, Tue, p.m., Town Center Exhibit Area
Mader M.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Mader M. M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mader M. M.  Environmental Analog Posters, Tue, p.m., Town Center Exhibit Area
Madhusudhan N.  Print Only: Planetary Atmospheres
Madiedo J. M.  Print Only: Small Bodies
Madsen M. B.  Mars Alteation, Wed, p.m., Waterway Ballroom 1
Magee B.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Magee B. A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Magee-Sauer K.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Magnelli D. E.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Magni G.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Magrin S.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Mahaffy P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mahaffy P. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mahaffy P. R.  Print Only: Mars
Mahaffy P. R.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Mahaffy P. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Mahaffy P. R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mahaney W. C.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Maier A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Mailhot M.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Mainzer A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Mainzer A.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Mainzer A. K. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Mainzer A. K.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Mainzer A. K.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Maki J. N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Makide K.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Malakhov A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Malakhov A.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Malakhov A. V.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Malakhov A. V.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Malaska M.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Malaska M.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Maldonado E. M.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Malespin C. A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Maleszewski C. K. Jr. Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Malin M. C.  Print Only: Mars
Mall U.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Mall U.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Manau N.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Mancinelli R.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Mandell A. M.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Mandrade L.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Mane A.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Mane A.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Manga M.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Manga M.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Manga M.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Mangold N.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Mangold N.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Mangold N.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Mangold N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mangold N. * Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Mann P.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Mann P.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Mann P.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Mann P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Manoj P.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Manoj R.  Print Only: Missions, Instruments, and Payload Concepts
Manthey A.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Marchand G. J.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Marchant D. R.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Marchant D. R.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Marchant D. R.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Marchant W.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Marchant W.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Marchi S.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Marchi S.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Marchi S.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Session/Topic</th>
<th>Room/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marchi S.</td>
<td>Lunar Impacts I, Fri, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Marchis F.</td>
<td>Small Bodies, Mon, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Marchis F.</td>
<td>Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marchis F.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marcucci E. C. *</td>
<td>Mars Alteration, Wed, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Marechal N.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marinangeli L.</td>
<td>Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marinangeli L.</td>
<td>Mars Sediments, Wed, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Marin-Carbonne J.</td>
<td>Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marin-Carbonne J.</td>
<td>Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marinova M.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marinova M. M. *</td>
<td>Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Marion C.</td>
<td>Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marion C.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marion C.</td>
<td>EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marion C. L.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marion G. M.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Markiewicz W. J.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Markiewicz W. J.</td>
<td>Venus, Wed, p.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Markiewicz W. J.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Markin J. K.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marmo C.</td>
<td>Special Session: Cryospheres II, Thu, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Marno B. L.</td>
<td>Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marnoza C. L. *</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Marinoboa C. L.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marone F.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marquardt D.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marra K.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Mars Odyssey GRS Science Team</td>
<td>Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Mars-Analogue Rock Collection Team</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marsh D. R.</td>
<td>Impacts I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marshall J. R.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marteimsson V.</td>
<td>Exobiology I, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Martin A. M.</td>
<td>Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martin C.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martin E. S.</td>
<td>Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martin P. D.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martinez J.</td>
<td>Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Martinez S.</td>
<td>Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martinez-Hernández F.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Martins Z.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marty B. *</td>
<td>Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Martynov M. B.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Maruoka T.</td>
<td>Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marzari F.</td>
<td>Print Only: Small Bodies</td>
<td></td>
</tr>
<tr>
<td>Marzari F.</td>
<td>Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marzo G. A.</td>
<td>Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marzo G. A.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marzo G. A.</td>
<td>Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Marzo G. A.</td>
<td>Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Maschi F.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Mase R. A.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Masiero J. *</td>
<td>Small Bodies, Mon, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Masiero J.</td>
<td>Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Masiero J.</td>
<td>Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Massé M.</td>
<td>Martian Layered Deposits Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Massé M. *</td>
<td>Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Massironi M.</td>
<td>Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Massironi M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Massironi M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mastrapa R. M.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Mastrapa R. M. E.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Mastrodemos N.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Mastunaga T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Mathé P.-E.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Mathieu R.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Matia S.  EPO Undergraduate Education Posters, Tue, p.m., Town Center Exhibit Area
MATMOS Team  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Matrajt G.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Matrajt G.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Matrajt G.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Matson D. L. *  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Matsubara Y.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Matsuda J.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Matsuda S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Matsuda S.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Matsui T.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Matsui T.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Matsui T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Matsui T.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Matsumoto K.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Matsumoto K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Matsumoto T.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Matsunaga T.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Matsunaga T.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Matsunaga T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Matsunaga T.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Matsunaga T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Matsunaga T.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Matsunaga T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Matsuno J.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Matsuno J.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Matthews L. S.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Matthews L. S.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Matthews L. S.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Matthews L. S.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Mattioda A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Maukonen D.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Maurice S.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Maurice S.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Maurice S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Maurice S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Matthews L. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Matthews L. S.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Maturilli A.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Maturilli A.  Mercury, Mon, p.m., Waterway Ballroom 1
Maturilli A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Matz K.-D.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Matz K.-D.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Matzel E.  Thermal and Magma tic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Maukonen D.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Maurice S.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Maurice S.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Maurice S.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Maurice S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Maurice S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Maxwell S.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Mayer D.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Mayer W.  Print Only: Cosmochemistry Print Only
Mayne R. G.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mayne R. G.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Mayo L. A.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Mazanek D.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Mazarico E.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Mazarico E.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Mazur J. E.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
McAdam A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
McAdam A. C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
McAdam M. M.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
McAdam M. M.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
McBride K. M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
McCaffrey V. P.  Exobiology II, Thu, a.m., Waterway Ballroom 1
McCanta M. C. * Venus, Wed, p.m., Montgomery Ballroom
McCarthy J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
McCarthy T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
McCausland P. J. A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McCausland P. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McCausland P. J. A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McClenahan T.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
McClenahan T.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
McClenahan T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
McClenahan T. P.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
McClintock W. E.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
McCollum T. M.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
McCord T.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
McCord T.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
McCord T. B.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
McCord T. B. * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
McCoy T.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
McCoy T. J.  Mercury, Mon, p.m., Waterway Ballroom 1
McCoy T. J.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
McCoy T. J.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
McCoy T. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McCoy T. J.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
McCoy T. J.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
McCubbin F.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
McCubbin F. M. * Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
McCubbin F. M.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
McCubbin F. M.  Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area
McCubbin F. M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McCubbin F. M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
McCubbin F. M.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
McCullough E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
McCutcheon W. A.  Mars Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
McCutcheon W. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
McDaniel P. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Mccormott K. H.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
McDonough W. F.  Achondrites, Mon, p.m., Waterway Ballroom 4
McDonough W. F.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
McDonough W. F.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
McDonough W. F.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McDonough W. F.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
McEnulty T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
McEwen A.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
McEwen A. * Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
McEwen A.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
McEwen A.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
McEwen A.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
McEwen A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
McEwen A. S.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
McEwen A. S.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
McEwen A. S.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
McEwen A. S.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
McEwen A. S.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
McEwen A. S.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
McEwen A. S.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
McEwen A. S.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
McEwen A. S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
McEwen A. S.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
McFadden L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McFadden L. A. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McGill G. E.  Venus Posters, Tue, p.m., Town Center Exhibit Area
McGinnis R. N.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
McGlynn I. O. * Mars Alteration, Wed, p.m., Waterway Ballroom 1
McGonigle C.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
McGovern J. A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
McGovern J. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
McGovern P.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
McGovern P. J. * Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
McGovern P. J.  Venus Posters, Tue, p.m., Town Center Exhibit Area
McGovern P. J.  Mars Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
McGovern P. J.  Lunar Impacts III, Fri, p.m., Waterway Ballroom 6
McGowan E. M.  Venus Posters, Tue, p.m., Town Center Exhibit Area
McGuire P. C.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
McGuire P. C.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
McGuire P. C.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
McHenry L. J.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
McHone J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
McInroy R. E.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
McInturf TB.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
McKay A. J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McKay A. J. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McKay C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
McKay C. P.  Print Only: Mars
McKay C. P.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
McKay C. P.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
McKay C. P.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
McKay D. S. * Carbon on Mars, Tue, p.m., Waterway Ballroom 1
McKay D. S.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
McKay D. S.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
McKay D. S.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
McKay D. S.  Print Only: Moon
McKeeby B. E.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
McKeegan K. D. Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
McKeegan K. D.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
McKeegan K. D.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
McKeegan K. D.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
McKeegan K. D.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
McKown N. K. * Mars Sediments, Wed, a.m., Waterway Ballroom 1
McKown N. K.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
McKinnon W. B.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
McKinnon W. B.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
McKinnon W. B.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
McKinnon W. B.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Mclaughlin S.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McLennan S. M.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
McMillan R.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
McMillan R. S.  Small Bodies, Mon, a.m., Waterway Ballroom 5
McMillan R. S.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
McMillan R. S.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
McNutt R. L. Jr.  Mercury, Mon, p.m., Waterway Ballroom 1
McNutt R. L. Jr.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
McSween H. Y.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
McSween H. Y.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
McSween H. Y.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
McSween H. Y. *  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
McSween H. Y. Jr.  Small Bodies, Mon, a.m., Waterway Ballroom 5
McSween H. Y. Jr.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
McSween H. Y. Jr.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
McSween H. Y. Jr.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Médard E.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Medina J.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Meech K.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Meech K. J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Meech K. J. *  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Mehta M.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Meier M. M. M.  Achondrites, Mon, p.m., Waterway Ballroom 4
Meier M. M. M.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Meier M. M. M.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Meier M. M. M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Melero Asensio I.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Melero Asensio I.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Melezhik V. A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Melles M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mellon M.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Mellon M. T.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Melosh H. J.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Melosh H. J.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Melosh H. J. *  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Melosh H. J.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Melosh H. J. *  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Melosh H. J.  Print Only: Missions, Instruments, and Payload Concepts
MEMIN Team  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Mendybaev R. A.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Meng X.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Meng X.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Meng X.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Mercer C. N. *  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Mercer J. A. *  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Merlin F.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Merline W.  Mercury, Mon, p.m., Waterway Ballroom 1
Merrill Floyd M. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Merrison J. P.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Mertzman S. A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Mertzman S. A.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Mesarch M.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Mesarch M.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Meschik A. P.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Meschik A. P.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Meschik A. P.  Early Solar System Reservoirs Posters, Thu, p.m., Town Center Exhibit Area
Meschik A. P.  Early Solar System Reservoirs Posters, Thu, p.m., Town Center Exhibit Area
Meschik A. P. *  Early Solar System Reservoirs Posters, Thu, p.m., Town Center Exhibit Area
Meschik A. P.  Early Solar System Reservoirs Posters, Thu, p.m., Town Center Exhibit Area
Meschik A. P.  Early Solar System Reservoirs Posters, Thu, p.m., Town Center Exhibit Area
Messina M.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Messina M.  Dusty Horizons I Posters, Thu, p.m., Waterway Ballroom 4
Messina M.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
MESSENGER Team  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Messer L.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Messmer P.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Mest S. C.  Moon Apollo-Lunokhod Legacy Posters, Thu, p.m., Town Center Exhibit Area
Mest S. C.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Mest S. C.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Metcalfe R.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Metzger P. T.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Metzger S.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Meunier A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Meyer B. S. *  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Meyer J. A.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Michael G.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Michael G. G.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Michaels T. I.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Michaels T. I.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Michalik H.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Michalik H.  Venus, Wed, p.m., Montgomery Ballroom
Michaliki J.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Michaliski J.  Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Michaliski J. R. * Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Michel F. A.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Michel P. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Michel P.  Achondrites, Mon, p.m., Waterway Ballroom 4
Michel P. * Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Michel P.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Mielke R. E.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Migliorini A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Migliorini A.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Mihályi K.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Mikkell T.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Mikhailli S. * Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Mikouchi T.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Mikouchi T.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Mikouchi T.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Mikouchi T.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Mikouchi T. * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Milam K. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Milam S. N.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Milam S. N. * Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Milan S. E.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Milazzo M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Milbury C.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Miles P.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Miles P. F.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Miles P. F.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Milikh G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Mikovich S. M.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Mikovich S. M.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Millar P. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Miller D. M.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Miller R. S.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Miller R. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Miller W. I.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Milliken R.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Milliken R. E.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Milliken R. E.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Milliken R. E.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Milliken R. E. * Mars Alteration, Wed, p.m., Waterway Ballroom 1
Milliken R. E.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Mills F.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Mills M. J.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Min K.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Min K.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Minnelli G.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Ming D.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Ming D. W.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Ming D. W.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Ming D. W.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Ming D. W.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Ming D. W.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Ming D. W.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ming H. L.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Mini-RF Science Team  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Mini-RF Team  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Mini-RF Team  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Mink R.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Minton D.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Minton D. A.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Minyuk P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
MOSOSTYS Team  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Misawa K.  Primitive Meteorites I Posters, Thu, p.m., Waterway Ballroom 4
Mishra R. K.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Misra A. K.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Misra A. K.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Misra A. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Misra A. K.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Mita H.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Mita M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Mitani T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Mitani T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mitchell B. K.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Mitchell J.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Mitchell J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mitchell K.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Mitchell K.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Mitchell K. L.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Mitchell K. L.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Mitchell K. L.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Mitrofanov I.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Mitrofanov I.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Mitrofanov I. G.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Mitrofanov I. G.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Mitrofanov I. G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Mitrofanov I. G.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Mitrofanov I. G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Mittlefehldt D. W.  Achondrites, Mon, p.m., Waterway Ballroom 4
Mittlefehldt D. W.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Mittlefehldt D. W.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Miura H.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Miura Y.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Miura Y.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Miura Y.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Miura Y. N.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Miyachi T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Miyake A.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Miyamoto H.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Miyamoto H. M.  Print Only: Outer Solar System
Miyamoto M.  Print Only: Cosmochemistry Print Only
Miyamoto M.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Mocquet A.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Modi A. L.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Moersch J.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Moersch J.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Moersch J.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Moersch J. E.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Moersch J. E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Moersch J. E.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Mogensen C. T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Moggi-Cecchi V.  Print Only: Differentiated Meteorites
Moggi-Cecchi V.  Print Only: Exobiology
Mohr-Westheide T.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Mojzsis S. J.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Mokrousov M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Mokrousov M. I.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Mokrousov M. I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Molano J. L.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Moldovan R.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Molina A.  Print Only: Planetary Atmospheres
Monroe A. A. * Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Monshizadehegan C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Montabone L.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Montagnac G.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Montanya J.  Print Only: Small Bodies
Montes-Hernandez G.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Montes-Hernandez G.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Monteux J. * Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Montgomery D. R.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Montmessin F.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Moon Zoo Team  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Moore J. M.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Moore J. M.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Moore J. M.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Moore J. M.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Moores J. E.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Mora C.  Print Only: Mars
Mora C.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Morales N.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Moratto Z.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Moratto Z.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Moratto Z. M.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Morbidelli A.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Morbidelli A.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Morbidelli A.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Moreschini P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Morgan A. M.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Morgan A. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Morgan F.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Morgan G. A.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Morgan G. A.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Morgan J.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Morgan J. V.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Morgenthaler J. P.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Moriarty D.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Moriarty D. P. III Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Morley J.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Morlok A.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Morlok A.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Moro Martin A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Morota T.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Morota T.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Morota T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Morota T.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Morota T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Moroz L. V.  Venus, Wed, p.m., Montgomery Ballroom
Morris A. J. W.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Morris A. P.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Morris M. A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Morris M. R.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Morris R. V. * Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Morris R. V.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Morris R. V.  
Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area

Morris R. V.  
Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area

Morris R. V.  
Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area

Morris R. V.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Morse B. J.  
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area

Morse T.  
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area

Mürl M.  
Print Only: Education and Public Outreach

Moscardelli L.  
Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area

Moseley G. E.  
Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area

Mosher D.  
Impact Experiments, Wed, a.m., Montgomery Ballroom

Mosher D. E.  
Impacts II Posters, Tue, p.m., Town Center Exhibit Area

Mosher D. E. *  
Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom

Moser J. A.  
Mini-Mimas, Thu, p.m., Montgomery Ballroom

Morse A.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Moskovitz N. A.  
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area

Moscoqueira I.  
Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area

Moscoqueira I.  
Coldsimember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5

Moss N. G.  
Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area

Motł-Diniz T.  
Small Bodies, Mon, a.m., Waterway Ballroom 5

Moscheira I.  
Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area

Mottola S.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Moudens A.  
Print Only: Cosmochemical Origins

Mouginis-Mark P.  
Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area

Mount C.  
Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area

Mousis O.  
Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area

Mousis O.  
Coldsimember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5

Mousseau A.  
Print Only: Planetary Atmospheres

Mousis O.  
Print Only: Outer Solar System

Moussas X.  
Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area

Movshovitz N. *  
Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5

Movshovitz N.  
Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4

Moyner F.  
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area

Moyner F.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Mu L. L.  
Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area

Muller B. E. A. *  
Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5

Muller M.  
Small Bodies, Mon, a.m., Waterway Ballroom 5

Muller N.  
Venus, Wed, p.m., Montgomery Ballroom

Muenker C.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Muirhead A. C. *  
Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6

Mukai T.  
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area

Mukai T.  
Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4

Mukherjee J.  
The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area

Mullac B. D.  
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area

Muller J.  
Mars Sediments, Wed, a.m., Waterway Ballroom 1

Muller J.  
Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area

Muller J.-P.  
Exobiology Posters, Thu, p.m., Town Center Exhibit Area

Muller J.-P.  
Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area

Mulpangi P.  
Impacts II Posters, Tue, p.m., Town Center Exhibit Area

Muminov M. M.  
Print Only: Moon

Mumma M. J. *  
Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5

Mungan G.  
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area

Muniz-Miranda M.  
Print Only: Exobiology

Münker C.  
Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5

Muralidharan K.  
Print Only: Cosmochemical Origins

Murchie S.  
Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area

Murchie S.  
Mars Alteration, Wed, p.m., Waterway Ballroom 1

Murchie S.  
Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1

Murchie S.  
Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Murchie, S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Murchie, S. L.  Mercury, Mon, p.m., Waterway Ballroom 1
Murchie, S. L.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Murchie, S. L.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Murchie, S. L.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Murchie, S. L.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Murchie, S. L.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Murray, J. B.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Murray, J. B.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Murty, S. V. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Musiol, S.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Musko, S.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Mustard, J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Mustard, J. F.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Mustard, J. F.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Mustard, J. F.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Mustard, J. F.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Mustard, J. F.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Mustard, J. F.* Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Mustard, J. F.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Mustard, J. F.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Mustard, J. F.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Mustard, J. F.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Mustard, J. F.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Muto, J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mutti, N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Mutti, N.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Myszka, J. A.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Nagahara, H.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Nagahara, H.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Nagahara, H.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Nagahara, H.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Nagahara, H.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Nagashima, K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Nagao, K.* Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Nagao, K.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Nagasubramanian, V.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Nagaoka, H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Nagarajan, S.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Nagase, T.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Nagashima, K.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Nagashima, K.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Nagashima, K.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Nagashima, K.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Nagashima, K.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Nagashima, K.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Nagashima, K.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Nagashima, K.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Nagasubramanian, V.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Nagasubramanian, V.  Print Only: Moon
Nagata, K.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Nagihara, S.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Nagy, M.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nagy, Sz.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Nagy, Sz.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Nagy Sz.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nahm A. L.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Nakamoto T.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Nakamoto T.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Nakamura A. M.  Print Only: Small Bodies
Nakamura A. M.  Print Only: Impacts
Nakamura A. M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Nakamura M. H.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Nakamura N. *  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Nakamura N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Nakamura R.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Nakamura R.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Nakamura R.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Nakamura R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Nakamura T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Nakamura T. *  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Nakamura T.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nakamura Y.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Nakamura-Messenger K.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Nakamura-Messenger K.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nakano T.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Nakano Y.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Nakashima D. *  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Nakashima D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Nakato A.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Nakato A.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nakazato E.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nakano T.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Namiki N. *  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Namiki N.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Namiki N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Namkung M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Namur O.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Nanbu S.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Nandikotkur G.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Nanson G.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Naraoka H.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Naraoka H. *  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Narendranath S.  Print Only: Missions, Instruments, and Payload Concepts
Nathaniel T. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Nathues A.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Nava R. A.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Navalgun R. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Navalgun R. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Nazarov M. A.  Print Only: Moon
Neal C. R.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Neal C. R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Neal C. R.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Neal C. R.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Neal C. R.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Neal K. L.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Neather A. C.  Print Only: Mars
Neathery T. L.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Needham A. W.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Nefian A.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Nefian A. V.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Neidholdt E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Neish C.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Neish C.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Neish C. D.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Neish C. D.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Neish C. D.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Neish C. D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nekvasil H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Nekvasil H.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Nelson J. V.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Nesvorný D.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Nesvorný D.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Nesvorný D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nesvorný D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nesvorný D.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Nesvorný D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nettles J.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Nettles J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Nettles J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Nettles J.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Nettles J. W.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Neubeck A.  Print Only: Exobiology
Neukum G.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Neukum G.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Neukum G.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Neukum G.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Neukum G.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Neukum G.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Neukum G.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Neukum G.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Neumair A.  Print Only: Cosmochemistry Print Only
Neumann G.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Neumann G. A.  Print Only: Missions, Instruments, and Payload Concepts
Neumann G. A.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Neumann G. A.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Neumann G. A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Neves M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Newcomer K. B.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Newman W. I.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Newson H.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Newson H.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Newson H.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Newson H. E.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Newson H. E.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Newson H. E.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Newson H. E.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Newson H. E.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Newson H. E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Newville M.  Print Only: Igneous Processes
Newville M.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Newville M.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Ng C.-Y.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Nguyen A. N. *  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Nguyen D.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Nguyen L.  Mercury Posters, Thu, p.m., Town Center Exhibit Area
Nicholson P. D.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Nicholson P. D.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Nicholson P. D.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Nicholson W.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Nickerson R. D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nickerson R. D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Nickl I.  EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Nicoll K.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Niemann H. B.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Niimi R. *  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Niles P. B.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Niles P. B. * Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Niles P. B.  Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Niles P. B.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Niles P. B.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Nimmo F.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Nimmo F.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Nimmo F.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Nimmo F.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Nimmo F. * Mini-Mimas, Thu, p.m., Montgomery Ballroom
Nimmo F.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Nimura T.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Ninagawa K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Ninagawa K.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nishido H.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Nishiizumi K.  Achondrites, Mon, p.m., Waterway Ballroom 4
Nishiizumi K.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Nishiizumi K.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Nishiizumi K.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Nishikawa Y. N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Nishino M.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Nittler L.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Nittler L. R.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Nittler L. R.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Nittler L. R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Nittler L. R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Nittler L. R.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Nixon C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Noble S.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Noble S. K. * Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Noble S. K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Noda H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Noda H.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Noe Dobrea E.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Noe Dobrea E. Z.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Noe Dobrea E. Z. * Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Noe Dobrea E. Z.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Noe Dobrea E. Z.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Noell A. C.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Noguchi R.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Noguchi R.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Noguchi R.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Noguchi R.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Noguchi T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Noguchi T.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Noguchi T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Noguchi T. * Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Noguchi T.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Nogueira J. R.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Nolan M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Nolan M. C.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Nornberg P.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Noschese R.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Nowicki K.  Print Only: Missions, Instruments, and Payload Concepts
Nowicki L.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Nowicki S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Nyflot Th.  Print Only: Moon
Nunes D. C.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Nunez J. I.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Nuth J. A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Nuth J. A. III* Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Nuti S.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area

42nd LPSC Program Index  313
<table>
<thead>
<tr>
<th>Name</th>
<th>Event Description</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nylen T. H.</td>
<td>Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E.</td>
<td>Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E. *</td>
<td>Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E.</td>
<td>Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E.</td>
<td>SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E. *</td>
<td>Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Nyquist L. E.</td>
<td>Lunar Impacts I, Fri, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Occhini F.</td>
<td>Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Oberst J.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Oberst J.</td>
<td>Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Oberst J.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Oberst J.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>O’Brien D. P.</td>
<td>Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>O’Brien D. P. *</td>
<td>Achondrites, Mon, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>O’Brien D. P.</td>
<td>Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>O’Brien D. P.</td>
<td>Planetary Differentiation, Thu, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>O’Brien D. P.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ockert-Bell M. E.</td>
<td>Small Bodies, Mon, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>O’Dea E. R. *</td>
<td>Small Bodies, Mon, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Ody A.</td>
<td>Mars Alteration, Wed, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Ody A. *</td>
<td>From Mantle to Crust, Fri, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Oehler D. Z.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Oehler D. Z.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogami T.</td>
<td>Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ogawa K.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogawa K.</td>
<td>The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogawa N.</td>
<td>Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogawa Y.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ogawa Y.</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ogawa Y.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogawa Y.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogiore R.</td>
<td>Dusty Horizons, Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ogiore R. C. *</td>
<td>Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ogiore R. C.</td>
<td>Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ogiore R. C.</td>
<td>Dusty Horizons, Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ogiore R. C.</td>
<td>Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohkouchi T.</td>
<td>Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Öhman T. *</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Öhman T.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohno S. *</td>
<td>Impact Experiments, Wed, a.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Ohno S.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohsumi K.</td>
<td>Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ohtake M. *</td>
<td>Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtake M.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtake S.</td>
<td>Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtsuki K.</td>
<td>Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ohtsuki K.</td>
<td>Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Oikawa K.</td>
<td>Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Ojha L.</td>
<td>Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Ojha L.</td>
<td>Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Okada M.</td>
<td>Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Okada T.</td>
<td>Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Okada T.</td>
<td>Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
</tbody>
</table>
Okada T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Okamoto C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Okamoto C.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Okamoto C.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Okamoto C.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Okano O.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Okano O.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Okano S.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Okazaki R.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Okazaki R.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Okazaki R.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Okubo C.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Okubo C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Okubo C. H.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Okudaira K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Okudaira K.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Okudaira K.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Okudaira O.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Olinger C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Olinger C. T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Oliva M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Ollila A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Ollila A. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Olsen A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Olivo M.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Oman C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
O’Neill C.  Venus, Wed, p.m., Montgomery Ballroom
Ong L.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Ong L.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Ong L.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Ong L.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Ong W. J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Onose N.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Opanasenko N. V.  Print Only: Moon
OpenLuna Science Team  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Orgel Cs.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Ori G. G.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Ori G. G.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Orlando T. M.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Orloff T. C.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Ormö J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Ormö J.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Orofino V.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Orosei R.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
O’Rourke J. G.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Orr T. R.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Orthous-Daunay F.-R.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Orthous-Daunay F.-R.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Ortiz J.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Ortiz J. L.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Orzechowska G.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Osawa T.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Oshrin J. G.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Osinski G.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Osinski G. R.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Osinski G. R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Osinski G. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Osinski G. R.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Osinski G. R.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Osinski G. R.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Osinski G. R.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Osinski G. R.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Osinski G. R.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Osterloh B.  Venus, Wed, p.m., Montgomery Ballroom
Osterloo M. M.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Ostman D.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Ostrach L. R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Ostrowski D.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Ostrowski D. R.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
O'Sullivan K.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
O'Sullivan K. M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
O'Sullivan K. M.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Otake H.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Otsuki M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Ott U.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Ott U.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Ott U.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Ott U.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Ott U.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Otto C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Oura Y.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ouyang Z. Y.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Owen T. C.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Ozaki N.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Ozawa K.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Ozawa K.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Ozawa K.  Presolar Grains Posters, Thu, p.m., Town Center Exhibit Area
Ozawa K.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Ozawa K.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Ozawa K.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Ozima M.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Pack A.  Print Only: Cosmochemistry Print Only
Pack A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Pack A.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Pack A.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Pack A.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Pack A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Pacros A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Paganini L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Pagliari M.  Print Only: Exobiology
Pahlevan K.  Print Only: Cosmochemical Origins
Paige D.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Paige D. A.  Mercury, Mon, p.m., Waterway Ballroom 1
Paige D. A.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Paige D. A.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Paige D. A.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Paige D. A.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Paige D. A.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Paige D. A.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Paige D. A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Paige D. A.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Paige D. A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Palma R. L.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Palme H.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Palme H. * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Palme H.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Palme H.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Palme H.  Print Only: Cosmochemistry Print Only
Pando K.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Pando K.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Paolicchi P.  Print Only: Small Bodies
Papadimos A.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Papanastassiou D. A. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Papanastassiou D. A.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Papike J. J.  Print Only: Igneous Processes
Papike J. J.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Papike J. J.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Papike J. J.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Pappalardo R.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Pappalardo R. T. * Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Paque J. M.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Paque J. M. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Paradis P.-F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Paranicas C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Parente M.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Parente M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Pariente M.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Park D. I.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Park J.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Park S. J.  Print Only: Mars
Parker J. Wm.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Parker J. Wm.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Parker T.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Parker T.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Parker T. J.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Parker T. J.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Parnell J. * Exobiology II, Thu, a.m., Waterway Ballroom 1
Parsons A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Parsons R. A.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Pashai P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Patchen A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Pathare A.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Pathare A.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Pathare A. V.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Pati J. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Patterson G. W.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Patterson G. W.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Patterson G. W.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Patterson G. W.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Patterson G. W.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Patterson W.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Patthoff D. A. * Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Paty C.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Patzer A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Patzer A.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Pätzhold M.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Paulsen G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Paulson G.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Pavlov A. A.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Pavlov S. G.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Peale R. E.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Pearce G.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Pearl J. C.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Pearson V. K.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Pecchia A. G.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Pedersen L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Pedrosa M. M.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Peel S.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Peel S. E.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Pickersgill A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Pierazzo E.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Pierazzo E.  EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Pierazzo E.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Pierazzo E.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Pierazzo E.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Pieters C.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Pieters C.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Pieters C. M.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Pieters C. M.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Pieters C. M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Pieters C. M.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Pieters C. M.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Pieters C. M.* Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Pieters C. M.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Pieters C. M.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Pieters C. M.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Pieters C. M.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Pike W. T.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Pilgrim R. P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Pillinger C. T.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Pilorget C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Pina P.  Print Only: Mars
Pina P.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Pina P.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Pina P.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Pinet P.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Pinet P. C.  Print Only: Moon
Pinet P. C.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Pinet P. C.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Ping J.  Atmospheres: Observations and Processes Posters, Thu, p.m., Town Center Exhibit Area
Ping J.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Ping J.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Pinilla-Alonso N.  Print Only: Small Bodies
Piquette M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Pithawala T. M.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Pitman K. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Pitman K. M.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Pitt D.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Pittarello L.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Pittarello L.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Pittichova I.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Pizzarello S.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Platz T.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Platz T.  Mars: Terrestrial Analogues Posters, Tue, p.m., Town Center Exhibit Area
Platz T.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Platz T.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Plaut J.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Plaut J. J.* Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Plaut J. J.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Plaut J. J.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Plescia J.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Plescia J. B.* Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Plescia J. B.* Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Pleska L.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Plesko C. S.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Podosek F. A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Poelchau M.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Poelchau M. H.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Poelchau M. H.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Time</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poelking E.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Politi R.</td>
<td>Atmospheres: Observations and Processes Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Polito P. J.</td>
<td>Titan Everything Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pollard W.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pollard W. H.</td>
<td>Special Session: Cryospheres II</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Pollard W. H.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pommerol A.</td>
<td>Small Bodies</td>
<td>Mon, a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Pommerol A.</td>
<td>Special Session: Cryospheres III</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Pommerol A.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pommier L.</td>
<td>Planetary Differentiation</td>
<td>Thu, a.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Ponce A.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pondrelli M.</td>
<td>Martian Layered Deposits Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pondrelli M.</td>
<td>Mars Sediments</td>
<td>Wed, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Pontoppidan K. M.</td>
<td>Cosmochemical Origins I, Mon, a.m.</td>
<td>Wed, a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Poppe A.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Poppe A. R.</td>
<td>Giant Planets and Rings Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Porco C. C.</td>
<td>Icy Surfaces and Interiors Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Porco C. C.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Portyankina G.</td>
<td>Special Session: Cryospheres III</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Portyankina G.</td>
<td>Seasonal Ice Processes Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pösges G.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Posiolova L.</td>
<td>Print Only: Mars</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Posta J.</td>
<td>Primitive Meteorites Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Postberg F.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Postberg F. *</td>
<td>Dusty Horizons</td>
<td>Thu, p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Postberg F.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Postberg F.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Postma G.</td>
<td>Martian Fanclub Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Postma G.</td>
<td>Mars Fluvial Processes Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Poston M. J.</td>
<td>Materials Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Potter R. W. K.</td>
<td>Terrestrial Impact Craters</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Potter R. W. K.</td>
<td>Impacts II Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Potter R. W. K.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Potter R. W. K.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Potter R. W. K.</td>
<td>Lunar Impacts II Posters</td>
<td>Fri, p.m.</td>
<td>Waterway Ballroom 6</td>
</tr>
<tr>
<td>Poulet F.</td>
<td>Mars Sediments</td>
<td>Wed, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Poulet F.</td>
<td>Mars Alteration</td>
<td>Wed, p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Poulet F.</td>
<td>Impact Processes on Mars Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Poulet F.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Poulet F.</td>
<td>From Mantle to Crust</td>
<td>Fri, p.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Pourangi A.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pourmand A.</td>
<td>Cosmochemical Origins II</td>
<td>Tue, p.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Povenmire H.</td>
<td>Print Only: Impacts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powell K. E.</td>
<td>Iron Meteorites and Pallasites Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prado D. C.</td>
<td>Impacts II Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prasad T.</td>
<td>The Medusae Fossae Formation Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pratesi G.</td>
<td>Print Only: Differentiated Meteorites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pratesi G.</td>
<td>Print Only: Exobiology</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prather E.</td>
<td>Education and Public Outreach</td>
<td>Tue, p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Prather E. E.</td>
<td>Education and Public Outreach</td>
<td>Tue, p.m.</td>
<td>Montgomery Ballroom</td>
</tr>
<tr>
<td>Pratt L. M.</td>
<td>Crusty Mars Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pravdivtseva O.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pravdivtseva O. V.</td>
<td>Early Solar System II Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Pravdivtseva O. V.</td>
<td>Early Solar System Reservoirs III</td>
<td>Fri, a.m.</td>
<td>Waterway Ballroom 4</td>
</tr>
<tr>
<td>Preeden U.</td>
<td>Terrestrial Impact Craters</td>
<td>Tue, a.m.</td>
<td>Waterway Ballroom 5</td>
</tr>
<tr>
<td>Preston L.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prettyman T.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prettyman T. H.</td>
<td>Special Session: Cryospheres I</td>
<td>Mon, a.m.</td>
<td>Waterway Ballroom 1</td>
</tr>
<tr>
<td>Prettyman T. H.</td>
<td>Samples and Spectroscopy Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prettyman T. H.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
<tr>
<td>Prettyman T. H.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m.</td>
<td>Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Preusker F. Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Preusker F. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Price M. C. Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Price M. C. Impact Experiments, Wed, a.m., Montgomery Ballroom
Price M. C. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Price M. C. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Price M. C. Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Price M. C. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Pritchard M. E. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Pritchard M. E. Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Prockter L. M. Mercury, Mon, p.m., Waterway Ballroom 1
Prockter L. M. Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Prockter L. M. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Prockter L. M. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Prockter L. M. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Prosser B. J. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Protopapa S. Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Pryor W. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Pryor W. R. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Puchtel I. S. Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Puchtel I. S. Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Puchtel I. S. Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Puchtel V. Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Puckett A. W. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Pugh R. N. EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Pujols P. Print Only: Small Bodies
Pullan D. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Pullan D. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Pun A. Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Purucker M. E. Mercury Posters, Tue, p.m., Town Center Exhibit Area
Putzig N. E. Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Putzig N. E. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Putzig N. E. Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Qadi A. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Qualls F. B. The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Quantin C. Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Quantin C. Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Quartini E. Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Quick L. C. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Quincey D. J. Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Quinn D. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Quinn D. P. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Quinn J. E. Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Quinn R. Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Quinn R. C. * Exobiology I, Thu, a.m., Waterway Ballroom 1
Quinn R. C. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Quirico E. Small Bodies, Mon, a.m., Waterway Ballroom 5
Quirico E. A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Quirico E. Orgamics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Quirico E. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Quirico E. * Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Quirk K. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Raack J. Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Raack J. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Raaen E. Print Only: Mars
Raaen E. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Raddick J. Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Radebaugh J. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Radebaugh J. Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Radebaugh J. * Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Radebaugh J. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Radebaugh J. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Radhadevi P. V.  Print Only: Moon
Radhadevi P. V.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Radhakrishna V.  Print Only: Missions, Instruments, and Payload Concepts
Radioti A.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Radovan H. A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Radovan H. A.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Rahman Z.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Rahman Z.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Rahman Z.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Rahman Z.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Rai N. *  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Raines J.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Raitala J.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Raitala J. T.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Rajasekhar R. P.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Ramboz C.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Ramboz C.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Ramesh K. T.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Ramond E. C.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Ramos M.  Print Only: Planetary Atmospheres
Rampe E.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Rampe E. B. *  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Ramsey M. S.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Ramsey M. S.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Ramsey M. S.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Rao M. N.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Rappenglück M. A.  Print Only: Cosmochemistry Print Only
Rasay R.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Raschke U. *  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Rask J. C.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Ratcliff J. T. *  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Rathburn J. A.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Raub R.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Rauschenbach I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ray T. L.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Rayman M.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Rayman M. D.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Raymond C. A.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Raymond C. A.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Raymond C. A.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Raymond S. N.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Reach W. T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Rearick M. S.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Redding B.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Reddy V. *  Small Bodies, Mon, a.m., Waterway Ballroom 5
Reddy V.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Reddy V.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Redman D.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Reed C.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Reed C. L. B.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Reed N.  Special Session: Cryosheres I, Mon, a.m., Waterway Ballroom 1
Reedy R. C.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Reedy R. C.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Reedy R. C.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Reedy R. C.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Reedy R. C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Reese Y.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Reese Y.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Reese Y. D.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Reese Y. D.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Refaat T. F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Reh K.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Reimold W. U. * Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Reimold W. U.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Reimold W. U.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Reiners P. W.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Reisenfeld D.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Reisenfeld D. B.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Reiser F.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Reiss D.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Reiss D.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Reiss D.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Reiss D.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Reiss D.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Reiss D.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Remijan A. R.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Rempel A. W.  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Remusat L.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Ren X.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Renno N.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Renno N. O. * Exobiology I, Thu, a.m., Waterway Ballroom 1
Resor P. G.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Retherford K. D.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Retherford K. D.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Reufer A. * Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Reynolds C. M.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Reynolds V. S.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Rhoden A.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Rhodes E. A.  Mercury, Mon, p.m., Waterway Ballroom 1
Rhodes E. A.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Ricco A. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Rice J.  Environmental Analogs Posters, Thu, p.m., Town Center Exhibit Area
Rice J.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Rice J. W.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Rice J. W. Jr.  Planetary Mission Concepts Posters, Thu, p.m., Town Center Exhibit Area
Rice M.  Environmental Analogs Posters, Thu, p.m., Town Center Exhibit Area
Rice M. S.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Richardson D. C.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Richardson D. C.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Richardson J. E. * Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Richardson M. I.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Richardson P. W.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Riches A. J. V. * Achondrites, Mon, p.m., Waterway Ballroom 4
Riches A. J. V.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Richter F. M. * Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Richter I.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Rickman H.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Riedo A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Rietmeijer F. J. M.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Rietmeijer F. J. M.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Righter K. * Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Righter K.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Righter K.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Righter K.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Righter K.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Righter K.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Righter M. * Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Riner M. A.  Mercury, Mon, p.m., Waterway Ballroom 1
Riner M. A.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Riner M. A.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Riofrío L. M. - Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Ristvey J. - EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Ritzer J. A. - Mercury Posters, Tue, p.m., Town Center Exhibit Area
Rivera-Valentin E. G. - Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Rivera-Valentin E. G. * - Mini-Mimas, Thu, p.m., Montgomery Ballroom
Rivera-Valentin E. G. - Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Rivers M. L. - Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Rivkin A. S. * - Small Bodies, Mon, a.m., Waterway Ballroom 5
Rivkin A. S. - Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Rivkin A. S. - Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Rivkin A. S. - Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Rivkin A. S. - Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Rivkin A. S. - The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Rivkin A. S. - Print Only: Small Bodies
Rivoldini A. - Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
RLS Team - Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Roach L. H. - Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Roark S. - Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Roatsch T. - Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Roatsch T. - A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Roatsch T. - Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Roatsch T. - Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Roatsch Th. - Venus, Wed, p.m., Montgomery Ballroom
Robbins E. A. - Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Robbins S. - Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Robbins S. - Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Robbins S. - Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Robbins S. J. * - Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Robbins S. J. - Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Roberson L. B. - Materials Analogos Posters, Thu, p.m., Town Center Exhibit Area
Robert F. - Print Only: Differentiated Meteorites
Roberts J. - Mini-Mimas, Thu, p.m., Montgomery Ballroom
Roberts J. H. * - Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Roberts J. H. - Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Robertson S. - The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Robinson B. - Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Robinson K. L. * - Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Robinson M. - Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Robinson M. - Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. - Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. R. - Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Robinson M. S. - Impacts: Modeling and Remote Sensing, Thu, p.m., Waterway Ballroom 5
Robinson M. S. - Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Robinson M. S. - Mercury Posters, Tue, p.m., Town Center Exhibit Area
Robinson M. S. - Thermal and Magmaic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Robinson M. S. - Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Robinson M. S. - Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Robinson M. S. - Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Robinson M. S. - Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Robinson M. S. - Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Robinson M. S. * - Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Robuchon G. * - Mini-Mimas, Thu, p.m., Montgomery Ballroom
Rocca M. - Print Only: Cosmochemical Origins
Rochette P. - Impact Experiments, Wed, a.m., Montgomery Ballroom
Rochette P. - Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Rodrigo R. - Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Rodrigue C. M.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Rodriguez J. A. P.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Rodriguez J. A. P.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Rodriguez M. C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Rodriguez S.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Rodriguez S.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Rodriguez-Manfredi J. A.  Print Only: Exobiology
Roe L.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Roe L.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Roe L. A.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Rogacki S.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Rogers A. D.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Rogers A. D.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Rolling W.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Romine G. C.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Romine G. C.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Root M. J.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Roques F.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Rosemberg C.  Print Only: Moon
Rosenburg M.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Rosiek M.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Rosiek M. R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Ross A. J. *  Achondrites, Mon, p.m., Waterway Ballroom 4
Ross D.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Ross D. K.  Thermal and Magmaic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Ross D. K.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Ross D. K.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Ross D. K.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Ross K.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Rossi A.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Rossi A. P.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Rossi A. P.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Rossman G. R.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Rossman G. R.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Rossman G. R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Rost D.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Roush T. L.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Roush T. L.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Roush T. L.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Roussos E.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Rouzaud J.-N.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Rowlands D. D.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Roy S.  Impacts II Posters, Thu, p.m., Town Center Exhibit Area
Rózsa P.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Rubie D. C. *  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Rubin A. E.  Print Only: Cosmochemistry Print Only
Rubin A. E.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Rubin A. E.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Rubin A. E.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Rubin A. E.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Rubin M.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Rudolph M. L.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Ruff S. W. *  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Ruff S. W.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Rugel G.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Rugel G.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Rull F.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Rull F.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  Achondrites, Mon, p.m., Waterway Ballroom 4
Rumble D. III  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Rumble D. III  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Rumble D. III  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Rumble D. III  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Runc S.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Runc S. K.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Runge K.  Print Only: Cosmochemical Origins
Runyon C. J.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Runyon K. D.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Runyon S. E.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Russell C. T.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Russell C. T.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Russell C. T.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Russell C. T.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Russell M. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Russell P. S.  Cryosphere: Icy Insights Posters, Tue, p.m., Town Center Exhibit Area
Russell P. S.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Russell P. S.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Russell P. S.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Russell R. W.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Rutherford M. J.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Rutledge A. M. *  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Ruzicka A. *  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Ruzicka A. M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Ruzicka A. R.  EPO Meteorites Posters, Tue, p.m., Town Center Exhibit Area
Rybus T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Ryczyniak M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Saal A. E.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Sabau L.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Sadilenko D. A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Safko T.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Sagamit P. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sagdeev R.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Sagdeev R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sagdeev R. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sagdeev R. Z.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Saihaba J.  Print Only: Moon
Saihaba J.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Saito K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Saito Y.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sakai R. *  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Sakaiya T.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Sakamoto N.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Sakamoto N.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sakatani N.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Salamuniccar G.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Salamuniccar G.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Salamuniccar G.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Salamuniccar G.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Salamuniccar G.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Salese F.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Salge T.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Salimkumar B.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Salvatore M. R.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Samarasinha N.  Print Only: Small Bodies
Samarasinha N. H.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Samson C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Sanborn M. E. *  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Sanchez H.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Sánchez P.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Sánchez P.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Sanders I. S.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Sandford S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sandford S.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Sandford S.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Sandford S. A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Sandford S. A.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sandford S. A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Sandford S. A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Sandor M.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Sanu C.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Sanfrançois R.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Sangen K.  Print Only: Impacts
Sanin A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sanin A. B.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Sanin A. B.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sanin A. B.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Sanin A. B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sano Y.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Sano Y.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Sans Tresseras J. A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Sans Tresseras J. A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Sansano A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Sansano A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Santiago D.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Santiago-Sanz P.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Santoro C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Santos O.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Santos-Sanz P.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Saper L.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Saper L. M.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Saraiva J.  Print Only: Mars
Saraiva J.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Saraiva J.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Saraiva J.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Saraykin V. V.  Print Only: Moon
Sarrazin P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sasaki S.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Sasaki S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sasaki S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Sasaki S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Satake W.  A Post-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Satake W.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Satake W.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Sato H.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Sato H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Sator N.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Satterwhite C. E.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Savage C. J.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Savanevich V. E.  Asteroid Discovery Posters, Tue, p.m., Town Center Exhibit Area
Savina M. R.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Savina M. R.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Savina M. R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Sayyed M. R. G.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Sayyed M. R. G.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Scalice D.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Scalice D. M.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Schaefer E. I. * Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Schaefer E. I.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Schaefer J.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Schäfer F.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Schäfer F.  
Impact Experiments, Wed, a.m., Montgomery Ballroom

Schaller E. L.  
Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area

Scharfstein G.  
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area

Schauble E. A.  
Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4

Scheeres D. J. *  
Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5

Scheeres D. J.  
Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area

Scheit S.  
Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area

Scheidt S. P.  
The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area

SENK P. *  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Schenk P. M.  
Impacts:  Modeling and Remote Sensing, Thu, p.m., Waterway Ballroom 5

Schenk P. M.  
Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area

Schenk P. M.  
Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area

Schenk P. M.  
Coldmember:  Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5

Schettino V.  
Print Only:  Exobiology

Schieber J.  
Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area

Schleicher D. G.  
Special Session:  Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5

Schleifarth K.  
Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5

Schmedemann N. *  
Mini-Mimas, Thu, p.m., Montgomery Ballroom

Schmedemann N.  
Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area

Schemel M.  
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area

Schmerr N. C.  
Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area

Scheidt S. P.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Schmitz B.  
Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area

Schneider M.  
Impacts II Posters, Thu, p.m., Town Center Exhibit Area

Schmitt B.  
Small Bodies, Mon, a.m., Waterway Ballroom 5

Schmitt B.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Schmitt B.  
Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area

Schmitt B.  
Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area

Schmitt R. T.  
Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5

Schmitt R. T.  
Impacts I Posters, Tue, p.m., Town Center Exhibit Area

Schmitz B.  
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area

Schmitz N.  
Environmental Analogues Posters, Tue, p.m., Town Center Exhibit Area

Schmitz S.  
Dusty Horizons, Thu, p.m., Waterway Ballroom 4

Schmitz S.  
Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area

Schmieder M.  
Print Only:  Outer Solar System

Schofield C. M. D.  
Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6

Scholes D. M.  
Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area

Scholten F.  
Formation and Evolution of the Moon III, Tue, Waterway Ballroom 6

Scholten F.  
Venus, Wed, p.m., Montgomery Ballroom

Scholten F.  
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area

Scholten F.  
Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area

Scholten F.  
Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area

Scholten F.  
The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area

Scholten F.  
Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area

Schon S. C.  
Special Session:  Cryospheres I, Mon, a.m., Waterway Ballroom 1

Schon S. C. *  
Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1

Schon S. C.  
Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area

Schonbächer M.  
Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4

Schönbächler M.  
Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area

Schoonjans T.  
Dusty Horizons, Thu, p.m., Waterway Ballroom 4

Schoonjans T.  
Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area

Schorghofer N.  
Print Only:  Data Tools, Access, and Archiving

Schorghofer N.  
Martian Ground Ice Posters, Thu, p.m., Town Center Exhibit Area
Schrader C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Schrader C. M.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Schrader C. M.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Schrader D. L.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Schreiber K.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Schröder C.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Schröder S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Schubert G.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Schuerger A. C.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Schulson E. M.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Schultz P.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 5
Schultz P. H.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Schultz P. H.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Schultz P. H.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Schultz P. H.  Print Only: Planetary Dynamics and Tectonics
Schulz T.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Schutt J. W.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Schvetsov V.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Schwandt C. S.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Schwarz W. H.  Print Only: Small Bodies
Schweitzer J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Schwenzer S. P.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Schwenzer S. P.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Schwenzer S. P.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Schwenzer S. P.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Scott C.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Scott E. R. D.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Scott E. R. D.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Scott J. V.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Sears M. L.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Sears D. W.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Sears D. W. G.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Sears D. W. G.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Sears D. W. G.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Sears D. W. G.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Sebastian E.  Print Only: Exobiology
Sebastian S.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Seda T.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Seddio S. M.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Seelos F.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Seelos F. P.  Mercury Postsers, Tue, p.m., Town Center Exhibit Area
Seelos F. P.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Seelos F. P.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Seelos F. P.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Seelos K. D.  Mercury, Mon, p.m., Waterway Ballroom 1
Seelos K. D.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Seelos K. D.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Segreti M. A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Segura M. E.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Seibert M.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Seidman D. N.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Seidman D. N.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Séjourné A. *  Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Sekhar P.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Segikuchi T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sekimoto S.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sekine Y.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Selby C. M.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Sellar R. G.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Semjenova L. F.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Semjonova L. F.  Print Only: Interplanetary and Presolar Dust
Senatore C.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Seneshu H.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Senshu H.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Senske D. A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Sephonte M.  Lunar Crust Samples Posters,Tue, p.m., Town Center Exhibit Area
Serefuddin F.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Seto Y.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Sevestre D.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Seward L.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Seweryn K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Shaddad M. H.  Achondrites, Mon, p.m., Waterway Ballroom 4
Shafer J. T. *  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Shah R. D.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Shahar A.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Shahar A.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Shaheen R. *  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Shalgin E. V.  Print Only: Planetary Atmospheres
Shalgin E. V.  Venus, Wed, p.m., Montgomery Ballroom
Shalginova O. S.  Print Only: Planetary Atmospheres
Shaner A.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Shaner A. J.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Shangaraev A. A.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Shankar B.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Shankar B.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Shankar N.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Shankar N.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Shanmugam M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sharma P.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Sharma P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Sharma S. K.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Sharma S. K.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Sharma S. K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sharp T. G.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Sharp T. G.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Sharp T. G. *  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Sharp Z. D. *  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Sharp Z. D.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Sharp Z. D. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Sharpton V. L. *  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Sharpton V. L.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Sharpton V. L.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Shaslo J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Shaulis B.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Shaver C.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Shaw A.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Shibeli E.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Shea E. K.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Shea E. K.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Shean D. E.  Print Only: Mars
Shearer C.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Shearer C. K.  Print Only: Igneous Processes
Shearer C. K. *  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Shearer C. K.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Shearer C. K. Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Shearer C. K.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Shearer C. K. *  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Shearer C. K. Jr.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Shearer C. K. Jr.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Shearer C. K. Jr.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Sheehan P.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Shepard M. K.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Shepard M. K.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Shepard M. K.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Sherman K. M.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Shestopalov D. I.  Print Only:  Small Bodies
Shevchenko V.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Shevchenko V.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Shevchenko V.  Print Only: Moon
Shi D. Y.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Shi J.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Shibamura E.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Shigemori K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Shih C.-Y.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Shih C.-Y.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Shih C.-Y.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Shih C.-Y.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Shih C.-Y.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Shih C.-Y.  * From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Shih C.-Y.  Special Session:  Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Shih I. C.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Shilobreeva S. N.  Print Only:  Moon
Shimobayashi N.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Shipp S.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Shipp S.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Shipp S.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Shirai K.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Shirai K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Shirai N.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Shirai N.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Shiraishi H. S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Shirao M.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Shirley J. H.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Shirley M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Shkuratov Y. G.  Print Only: Mercury
Shkuratov Yu. G.  Print Only: Moon
Shockey K. M.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Showman A. P.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Shakholyukov A. *  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Shupla C. *  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Shupla C.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Shuster D. L.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Shvetsov V.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Shvetsov V.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Shvetsov V. N.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Siegler M. A. *  Mercury, Mon, p.m., Waterway Ballroom 1
Siegler M. A.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Siegler M. A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Sierchio J. M.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Siers H.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Siers H.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Sik A.  Print Only: Education and Public Outreach
Sik A.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Silva E. A.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Silva E. A.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Silversmit G.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Silversmit G.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Silvestro S.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Simionovici A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Simionovici A. *  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Simionovici A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Last Name</th>
<th>Title</th>
<th>Location</th>
<th>Date, Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simon A. C.</td>
<td>Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon J. I.</td>
<td>Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon S. B.</td>
<td>Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon S. B. *</td>
<td>Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonett A.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonetti A.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonetti A.</td>
<td>Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonia I.</td>
<td>EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simon-Miller A. A.</td>
<td>Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simons F. J.</td>
<td>Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simonson B.</td>
<td>Lunar Impacts I, Fri, a.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer K. N.</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer K. N. *</td>
<td>Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer K. N.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer K. N.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singer K. N.</td>
<td>Coldemember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singerling S. A.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singletary S.</td>
<td>Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singleton A.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singleton A. C. *</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinitsyn M. P.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinyaeva N. V.</td>
<td>Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sipiera P. P.</td>
<td>Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sipos A.</td>
<td>EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siskind J.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sisodia M. S.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sissay A.</td>
<td>Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sitko M. L.</td>
<td>Small Bodies Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sizemore H. G.</td>
<td>Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skidmore M.</td>
<td>Carbon on Mars, Tue, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J.</td>
<td>Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J. A.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J. A. Jr.</td>
<td>Print Only: Data Tools, Access, and Archiving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J. A. Jr.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J. A. Jr.</td>
<td>Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skinner J. A. Jr.</td>
<td>Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sklar L. S.</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sklute E. C.</td>
<td>Exobiology II, Thu, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skobeleva T. P.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skok J. R. *</td>
<td>From Mantle to Crust, Fri, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skopilak B.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skorov Yu. V.</td>
<td>Print Only: Small Bodies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skulte E. C.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slade M.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slater D.</td>
<td>Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slater D. C.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slater G. F.</td>
<td>Mars Alteration, Wed, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slavin J. A.</td>
<td>Mercury, Mon, p.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slavney S.</td>
<td>Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sloan G.</td>
<td>Small Bodies Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slyuta E. N.</td>
<td>Print Only: Moon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smekens J-F.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith C. L.</td>
<td>Achondrites, Mon, p.m., Waterway Ballroom 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. B.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. E.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. E.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. E.</td>
<td>Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. E.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith D. E.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith I. B. *</td>
<td>Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith I. B.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith J. H.</td>
<td>Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Smith K. B.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Smith M. R. *  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Smith P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Smith P. H.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Smith R.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Smith R. L. *  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Smith S.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Smith S. E. *  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Smith S. M.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Smith T.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Smrekar S. E.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Smrekar S. E. *  Venus, Wed, p.m., Montgomery Ballroom
Smrekar S. E.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Smrekar S. E.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Snake J. F.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Snake J. F. *  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Snead C. J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Snels M.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Snogdgrass C.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Snyder G.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Snyder G.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Soare R. J. *  Special Session: Cryospheres II, Thu, a.m., Waterway Ballroom 1
Sobron P.  Materials Analogs Posters, Thu, p.m., Town Center Exhibit Area
Sobron P.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Sobron P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Socki R. A.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Socki R. A.  Carbon on Mars, Thu, p.m., Waterway Ballroom 1
Socki R. A.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Soderblom J.  Planetary Mission Concepts Posters, Thu, p.m., Town Center Exhibit Area
Soe M.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Soe M. R.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Sohus A. M.  EPO Training the Next Generation Posters, Thu, p.m., Town Center Exhibit Area
Solanki S. S.  Print Only: Moon
Solomon S.  Mercury, Mon, p.m., Waterway Ballroom 1
Solomon S. C. *  Mercury, Mon, p.m., Waterway Ballroom 1
Solomon S. C.  Mercury Posters, Thu, p.m., Town Center Exhibit Area
Solomon S. C.  Print Only: Missions, Instruments, and Payload Concepts
Solomonidou A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Soltontoi M.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Solscheid S.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Somayazulu M.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Somogyi A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Sori M.  Terrestrial Impact Craters, Thu, a.m., Waterway Ballroom 5
Sori M.  Impacts II Posters, Thu, p.m., Town Center Exhibit Area
Sori M.  Cryosphere: Icy Insights Posters, Thu, p.m., Town Center Exhibit Area
Sori M. M.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Sorreggan G. S.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Sotin C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Sotin C.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Sotin C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Sotin C.  Venus, Wed, p.m., Montgomery Ballroom
Sotin C.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Soto J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Souchon A. L.  Asteroid Studies Posters, Thu, p.m., Town Center Exhibit Area
Souchon A. L.  Planetary Mission Concepts Posters, Thu, p.m., Town Center Exhibit Area
Souma N.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Souness C. J. *  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Souza A. N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sowe M.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Spaulding D. K.  Impacts: Modeling and Remote Sensing, Thu, p.m., Waterway Ballroom 5
Speicher E. A.  Samples and Spectroscopy Posters, Thu, p.m., Town Center Exhibit Area
Speicher E. A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Speicher E. A.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Speicher E. A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Speicher E. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Spence H. E.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Spencer J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Spencer J. R.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Speyerer E. J.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Speyerer E. J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Spicuzza M. J.  Lunar Crust Samples Posters, Thu, p.m., Town Center Exhibit Area
Spicuzza M. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Spicuzza M. J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Spiga A.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Spilde M. N.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Spilker L.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Spring N.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Sprung P.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Sprung P.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Spudis P. D.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Spudis P. D.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Spudis P. D.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Spudis P. D.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Spudis P. D.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Squire D.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Squire S.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Squire S. W.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Squire S. W.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Squire S. W.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Squire S. W.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Srama R.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Srama R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Srama R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Srama R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sramek O.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Šrámek O.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Sreekanth C. V.  Print Only: Missions, Instruments, and Payload Concepts
Sreekumar P.  Print Only: Missions, Instruments, and Payload Concepts
Srinivasan G.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Srinivasan M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Srinivasan S.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Srivastava N.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
St. Ange B.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Stack K. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Stadermann F. J.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Stadermann F. J.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Stadermann F. J.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Stadermann F. J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Stadermann F. J.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Stadermann F. J.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Staid M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Staid M.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Staid M.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Staid M.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Staid M. I.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Stam C. N.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Stampanoni M.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Stantzos N.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Stantzos N. W.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Starkey N. A.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Starr R.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Starr R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Starr R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Starr R. D.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Starratt S. W.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Starrfield S.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Starukhina L. V.  Print Only: Mercury
Statella T.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Staufer U.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Steele A.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Steele A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Steele A.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Steele A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Steele A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Steele A. * Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Steele R. J.  Mercury Posters, Tue, p.m., Town Center Exhibit Area
Stefanov W. L.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Stefanov W. L.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Stefansson A.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Steffl A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Steffl A. J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Stehlik H.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Stein T. C.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Steinberg J. T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Steinfeld D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Steinhardt P. J.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Steininger H.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Steinmetz E.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Stelling R.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Stephan K.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Stephan K.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Stephan T.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Stephan T.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Stephan T.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Stephan T.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Stepinski T. F.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Stepinski T. F.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Stepinski T. F.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Sterken V.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Stern J.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Stern J. C.  Print Only: Mars
Stern J. C.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Stern L. A.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Stern S. A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Stern S. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sternovsky Z.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sternovsky Z.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Steksy R.  Martian Layered Deposits Posters, Thu, p.m., Town Center Exhibit Area
Steksy R.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Stevenson D. J.  Print Only: Cosmochemical Origins
Stevenson D. J.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Stevenson D. J.  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Stewart R. R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Stewart S. T. * Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Stewart S. T.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Stewart S. T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Stewart S. T.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Stickle A. M.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Stickle A. M.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Stiles B. W.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Stiles B. W.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Topic</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stillman D. E.</td>
<td>Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Stillman D. E.</td>
<td>Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Stillman D. E.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stillman D. E.</td>
<td>Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stillman D. E.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stirling C. H.</td>
<td>Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stockstill-Cahill K. R. *</td>
<td>Mercury, Mon, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Stoddard P. R.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stodolna J. *</td>
<td>Dusty Horizons, Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Stodolna J.</td>
<td>Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E.</td>
<td>Titan Everything Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E.</td>
<td>Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E. R.</td>
<td>Icy Surface-Atmosphere Interaction Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E. R.</td>
<td>Titan Everything Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stofan E. R.</td>
<td>Venus Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stoker C.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stoker C. R.</td>
<td>Print Only: Mars</td>
<td></td>
</tr>
<tr>
<td>Stoker C. R.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stolper E. M.</td>
<td>Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>St-Onge G.</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Stooke P.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stooke P. J.</td>
<td>Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stopar J. D.</td>
<td>Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stopar J. D.</td>
<td>SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Storrie-Lombardi M. C.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stracke A.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strait M. M.</td>
<td>Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strait M. M.</td>
<td>Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strangeway R. J.</td>
<td>Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strashnov I.</td>
<td>Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strawn D. G.</td>
<td>Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Streekopytov S.</td>
<td>Achondrites Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strom R. *</td>
<td>Mercury, Mon, p.m., Waterway Ballroom 1</td>
<td></td>
</tr>
<tr>
<td>Strom R. G.</td>
<td>Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stromberg J.</td>
<td>Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stromberg J. M.</td>
<td>Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stromberg J. M.</td>
<td>Environmental Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Strong K.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stroud R. M. *</td>
<td>Unraveling the Origins of Presolar Grains, Thu, a.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Stroud R. M.</td>
<td>Dusty Horizons, Thu, p.m., Waterway Ballroom 4</td>
<td></td>
</tr>
<tr>
<td>Stroud R. M.</td>
<td>Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stroud R. M.</td>
<td>Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stroupe A.</td>
<td>Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stryk T.</td>
<td>Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stubbs T. J.</td>
<td>Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stubbs T. J.</td>
<td>Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6</td>
<td></td>
</tr>
<tr>
<td>Stubbs T. J.</td>
<td>A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stubbs T. J.</td>
<td>The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stucky G. D.</td>
<td>Exobiology Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Stumpf A.</td>
<td>Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Sturhahn W.</td>
<td>Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Sturkell E.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Sturm S.</td>
<td>Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5</td>
<td></td>
</tr>
<tr>
<td>Sturm S.</td>
<td>Impacts II Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Su X.</td>
<td>Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Su X. L.</td>
<td>Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Sucharski B.</td>
<td>Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Sudhakar M.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
</tr>
<tr>
<td>Sudheer Reddy D.</td>
<td>Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
<tr>
<td>Suetsugu R.</td>
<td>Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area</td>
<td></td>
</tr>
</tbody>
</table>
Sugawara T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Sugihara T.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Sugita S.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Sugita S.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Sugita S.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Sugita S.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Sugiura N.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Sugiyama K.  A chondrites Posters, Tue, p.m., Town Center Exhibit Area
Sullivan M. T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Sullivan R.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Sullivan R. * Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Sumner D. Y.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Sun C. * Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Sunshine J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Sunshine J.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Sunshine J.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Sunshine J.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Sunshine J. M.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Sunshine J. M. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Sunshine J. M.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Sunshine J. M.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Sunshine J. M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Sutter B.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Sutton S.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Sutton S. R.  Print Only: Igneous Processes
Sutton S. R.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Sutton S. R.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Sutton S. R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Sutton S. R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Sutton S. R.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Sutton S. R.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Sutton S. R.  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Sutton Y. C.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Suyama T.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Suzuki T.  Print Only: Small Bodies
Suzuki Y.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Svetsov V. V.  Print Only: Impacts
Swayze G.  Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Swift D. C.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Swillo M.  Print Only: Exobiology
Swindle T. D.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Swindle T. D.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Swindle T. D.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Swinyard B. M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Swisher C.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Swisher C. C.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Sykes M. V.  A chondrites Posters, Tue, p.m., Town Center Exhibit Area
Sykes M. V.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Sylvestre P.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Szathmáry E.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Szczesiak M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Szefiga W.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Szopa C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Szumlans M.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Szurgot M.  Print Only: Differentiated Meteorites
Tabares Rodenas P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Tabata M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Tachibana S.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Tachibana S.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Tachibana S.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Tachibana S.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Tachibana S.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Tachibana S. *  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Tada R.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Taguchi M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Tait K.  Achondrites, Mon, p.m., Waterway Ballroom 4
Tajika E.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Takahata N.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Takasawa S.  Print Only: Impacts
Takashima T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Takeda H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Takeda H.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Takeda H.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Takeda H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Takenaka H.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Takeuchi A.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Takigawa A. *  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Takigawa A.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Takigawa A.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Takigawa A.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Takir D. *  Small Bodies, Mon, a.m., Waterway Ballroom 5
Talboys D. L.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Talpe M. J.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Tamppari L. K.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Tanaka H.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Tanaka K. L.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Tanaka K. L.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Tanaka M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Tanaka M.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Tanaka S.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Tanaka S.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Tang G. Q.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Tang G.-Q.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Tang G.-Q.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Tang H. *  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Tang H. S.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Tang Z. S.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Tanigawa T.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Tanigawa T.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Tanigawa T.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Tanaka T.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Tanaka T.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Tansádi P.  Print Only: Education and Public Outreach
Tateno N.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Tato C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Taylor C. L.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Taylor G. J.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Taylor G. J.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Taylor G. J.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Taylor G. J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Taylor H. W.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Taylor L.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Taylor L. A.  Achondrites, Mon, p.m., Waterway Ballroom 4
Taylor L. A.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Taylor L. A.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Taylor L. A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Taylor L. A.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Taylor L. A.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Taylor L. A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Taylor L. A.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Taylor L. A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Taylor L. A.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Taylor L. A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Taylor P. A.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Taylor P. T.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Taylor S.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Tejfel V. G.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Telling J.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Telus M. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Telus M.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
ten Kate I. L.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
ten Kate I. L.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Teng F. Z.  Igneous Processes Posters Poster s, Thu, p.m., Town Center Exhibit Area
Teng F. Z.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Tennor T. J.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Tennor T. J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Teodosio L. F. A.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Teodosio L. F. A.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Teodosio L. F. A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Teolis B. D.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Teplyakova S. N.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Teplyakova S. N.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Teplyakova S. N.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Terazono J.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Terebessy T.  Print Only: Education and Public Outreach
Thaisen K. G.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Thangjam G.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Thebault P.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Thiel C.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Thiemens M.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Thiemens M.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Thiemens M. H.  Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Thiemens M. H.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Thiessen D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Thirwall M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Thirouin A.  Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Thissen R.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Tholen D.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Tholen D.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Thollot P.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Thom N. E.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Thompson K.  Impact I Posters, Tue, p.m., Town Center Exhibit Area
Thoma K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Thomas C. A.  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Thomas I. R.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Thomas N.  Special Session: Cryospheres III, Tue, a.m., Waterway Ballroom 1
Thomas N.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Thomas N.  Seasonal Ice Processes Posters, Tue, p.m., Town Center Exhibit Area
Thomas N.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Thomas O.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Thomas O. H.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Thomas P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Thomas P.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Thomas P.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Thomas P. C. * Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Thomas P. C.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Thomas P. C.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Thomas P. C.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Thomas S. M.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Thomas-Keprta K. L.  Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Thomas-Keprta K. L.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Thompson D. R.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Thompson D. R.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Day/Time, Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thompson D. R.</td>
<td>Volcanism in the Outer Solar System Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thompson S. D.</td>
<td>Print Only: Mars</td>
<td></td>
</tr>
<tr>
<td>Thompson T. W.</td>
<td>The Dust Bin Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson B.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson B. J. *</td>
<td>Lunar Surface and Volatiles</td>
<td>Thu, p.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Thomson B. J.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson B. J.</td>
<td>Moon Datasets Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson B. J.</td>
<td>The Dust Bin Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson B. J.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson L.</td>
<td>EPO Community Engagement Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Thomson O. A.</td>
<td>Exobiology I</td>
<td>Thu, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Thorsteinsson Th.</td>
<td>Print Only: Missions, Instruments, and Payload Concepts</td>
<td></td>
</tr>
<tr>
<td>Tielke J. A.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Timoshenko G. N.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tindle A. G.</td>
<td>EPO Moon Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tirsch D.</td>
<td>Mars Aeolian Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tissot F.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Titov D. V.</td>
<td>Venus, Wed, p.m., Montgomery Ballroom</td>
<td></td>
</tr>
<tr>
<td>Titus T. N.</td>
<td>Martian Ground Ice Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Titus T. N.</td>
<td>Seasonal Ice Processes Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Titus T. N.</td>
<td>Mars Aeolian Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Titus T. N.</td>
<td>Martian Pits and Caves Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tkalcec B. J.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tobie G.</td>
<td>Coldmember: Icy Ocean Worlds</td>
<td>Fri, p.m., Waterway Ballroom 5</td>
</tr>
<tr>
<td>Tobola K. *</td>
<td>Education and Public Outreach</td>
<td>Tue, p.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Tobola K.</td>
<td>EPO Moon Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Todd N. S.</td>
<td>Moon Apollo-Lunokhod Legacy Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Todd W. L.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Toellner T. S.</td>
<td>Instrument and Payload Concepts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tokar R. L.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tokunaga A.</td>
<td>Asteroid Studies Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tollstrup D.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Tollstrup D. T.</td>
<td>Cosmochemical Origins II Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tomkinson T.</td>
<td>SNC Meteorites Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tompkins S.</td>
<td>Lunar Crust Remote Sensing Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tompkins S.</td>
<td>Composition of the Lunar Crust</td>
<td>Wed, a.m., Waterway Ballroom 6</td>
</tr>
<tr>
<td>Tooth S.</td>
<td>Mars Aeolian Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Torii M.</td>
<td>Achondrites Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L.</td>
<td>Geology of Martian Impact Craters Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L. L.</td>
<td>Environmental Analogs Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L. L.</td>
<td>Geology of Martian Impact Craters Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L. L.</td>
<td>Lunar Impacts Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L. L.</td>
<td>Mars Instruments Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tornabene L. L.</td>
<td>From Mantle to Crust Posters</td>
<td>Fri, p.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Torrence M. H.</td>
<td>Moon Datasets Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Torrence M. H.</td>
<td>Moon Remote Sensing Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Torres Redondo J.</td>
<td>Impact Experiments</td>
<td>Wed, a.m., Montgomery Ballroom</td>
</tr>
<tr>
<td>Tortora P.</td>
<td>Planetary Mission Concepts Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tosca N. J. *</td>
<td>Mars Alteration</td>
<td>Wed, p.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Tosca N. J.</td>
<td>Exobiology I</td>
<td>Thu, a.m., Waterway Ballroom 1</td>
</tr>
<tr>
<td>Tosca N. J.</td>
<td>Mars Alteration Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Tosi F.</td>
<td>A Pre-Dawn Perspective Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Touboul M.</td>
<td>Planetary Differentiation Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Toucoulou R.</td>
<td>Dusty Horizons</td>
<td>Thu, p.m., Waterway Ballroom 4</td>
</tr>
<tr>
<td>Toucoulou R.</td>
<td>Dusty Horizons II Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Towner M.</td>
<td>Mars Aeolian Processes Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Towner M. C.</td>
<td>Crusty Mars Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Townsend L.</td>
<td>The Moon as an Airless Body Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Toyokuni G.</td>
<td>Planetary Dynamics and Tectonics Posters</td>
<td>Thu, p.m., Town Center Exhibit Area</td>
</tr>
<tr>
<td>Trafton L. M.</td>
<td>Icy Surface-Atmosphere Interaction Posters</td>
<td>Tue, p.m., Town Center Exhibit Area</td>
</tr>
</tbody>
</table>
Tragheim D. G.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Trainer M. G.  Print Only: Mars
Trainer M. G.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Tran T.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Tran T.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Tran T.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Tran T.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Tran T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Tran T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Tran T. N.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Tran T. N.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Trang D.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Trang D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Trappitsch R.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Trappitsch R.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Trauthan F.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Travis B. J.  Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Trease B.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Treiman A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Treiman A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Treiman A. H.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Treiman A. H.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Treiman A. H.  Carbon on Mars, Thu, p.m., Waterway Ballroom 1
Treiman A. H.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Treiman A. H.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Treiman A. H.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Treiman A. H. * Venus, Wed, p.m., Montgomery Ballroom
Treiman A. H.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Tremlay A.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Tretyakov V.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Tretyakov V.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Tretyakov V. I.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Tret'yakov V. I.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Tricarico P.  Print Only: Small Bodies
Tricarico P.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Tricky R.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Trieloff M.  Print Only: Small Bodies
Trieloff M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Trieloff M.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Trieloff M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Trigo-Rodriguez J. M.  Print Only: Small Bodies
Trigo-Rodriguez J. M.  Print Only: Small Bodies
Trindade A.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Tripa C. E.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Tripa C. E.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Trischan J.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Troiano J.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Troiano J.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Troll V. R.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Trombka J.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Trombka J.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Trombka J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Tronche E. J.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Tsang C. C. C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Tsang K. T.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Tschauer O.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Tseng W.-L.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Tsou P.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Tsou P.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Tsou P.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Tsuboi N.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Tsuchiyama A. *  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Tsuchiyama A.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Tsuchiyama A.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Tsuchiyama A.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Tsuchiyama A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Tsukamoto K.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Tsunakawa H.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Tu V.  Mars Alteration, Wed, p.m., Waterway Ballroom 1
Tu V.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Tucker J. M.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Tucker J. M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Tucoulou R.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Tulej M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Tullis J. A.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Turcan P.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Turner M. W.  EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Turrin B.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Turrini D.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Turtle E. P.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Turtle E. P.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Turtle E. P.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Turtle E. P.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Tyagi A.  Print Only: Missions, Instruments, and Payload Concepts
Tyliczszak T.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Tyliczszak T.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Tyra M. A. *  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Udagawa M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Udry A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Uemoto K. *  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Ueno M.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Ueno M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Uesugi K.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Uesugi M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Ulrich R.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Ulrich R.  Mini-Mimas, Thu, p.m., Montgomery Ballroom
Ulrich R.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Ulrich R.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Ulrich R.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Unbekannt H.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Underwood C. I.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Unnikrishnan U.  Print Only: Missions, Instruments, and Payload Concepts
Unrau T.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Unsworth C.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Urhqahart M. L.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Ushikubo T.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Ushikubo T.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Ushikubo T.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Ushikubo T.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Ustinova G. K.  Print Only: Cosmochemistry Print Only
Ustunisk G.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Usui T.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Usui T. *  From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Vago J. L.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Valentine C. P.  EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Vallely J. W.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Vallely J. W.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Vallely J. W.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Vallely J. W.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Valter A.  Print Only: Impacts
van Acken D.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Van De Wiel M.  Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
van den Berg A. P.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
van der Bogert C. H.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
van der Bogert C. H.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
van der Bogert C. H.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
van der Bogert C. H.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
van der Bogert C. H.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
van der Begert C. H.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
van der Velde O.  Print Only: Small Bodies
van Dyke L.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
van Gasselt S.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
van Gasselt S.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
van Gasselt S.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
van Gasselt S.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
van der Velde O.  Print Only: Small Bodies
van Westrenen W.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
van Westrenen W.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
van Wyk de Vries B.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
van Kan Parker M.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
van Kan Parker M.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
van Orman J.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Van Orman J. A. *  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Van Orman J. A.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
van Soest M. C.  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
van Westrenen W.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
van Westrenen W.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
van Westrenen W.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
van Westrenen W.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
van Wyk de Vries B.  Igeous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Vance S.  Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Vance S. D. *  Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Vander Kaaden K. E.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Vaniman D.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Vaniman D.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vaniman D. T.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Vaniman D. T.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Vaniman D. T.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Vaniman D. T.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vanzani V.  Print Only: Small Bodies
Varadan G.  Print Only: Moon
Varadan G.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Varanasi P.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Varela M. E.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Varenikov A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Varenikov A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Varenikov A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vargas T. N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Varga T. P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Vargas A.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Varghese P. L.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Vasavada A.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Vasavada A. R.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Vasconcelos M. A. R.  Icarus Posters, Thu, p.m., Town Center Exhibit Area
Vattuone L.  Print Only: Cosmochemical Origins
Vaubaillon J.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Vaughan W. M.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Vaughan W. M.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Vaz D. A.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Vaz D. A.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Vazquez J. L.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Vdovichenko V. D.  Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Veillette D.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Veehl L. A.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Veeramachaneni C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Veeramachaneni C.  Titan Everything Posters, Thu, p.m., Town Center Exhibit Area
Vegas A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vekemans B. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Vekemans B. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Velbel M. A. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Velbel M. A. Mars Alteration, Wed, p.m., Waterway Ballroom 1
Velbel M. A. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Velikodsky Yu. I. Print Only: Moon
Velikodsky Yu. I. Print Only: Planetary Atmospheres
Venegas G. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Verbriscer A. J. Coldmember: Icy Ocean Worlds, Fri, p.m., Waterway Ballroom 5
Verchovsky A. B. Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Verchovsky A. B. Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Veres M. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Verhoeven O. Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Verma V. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Vernazza P. Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Vernazza P. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Verner K. R. Venus Posters, Tue, p.m., Town Center Exhibit Area
Vernon D. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Verpoorter C. Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Verpoorter C. Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Versteeg M. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Versteeg M. H. The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Vervack R. J. Jr. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Veryovkin I. V. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Veryovkin I. V. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Veverka J. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Veverka J. Special Session: Comet Hartley 2 and Related Bodies I, Wed, a.m., Waterway Ballroom 5
Vicenzi E. P. SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Vickers M. J. Print Only: Education and Public Outreach
Vickers M. J. Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Vieira A. J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vieira G. Print Only: Mars
Vieira G. Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Vilas F. * Small Bodies, Mon, a.m., Waterway Ballroom 5
Vilas F. Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Villanueva G. L. Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Vinatier S. Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Vincent M. A. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vincele L. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Vinecz L. Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Vinkovic D. Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Viramonte J. G. Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Vishnevsky S. A. Print Only: Impacts
VISO M. Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Viviano C. E. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Viviano C. E. From Mantle to Crust, Fri, p.m., Waterway Ballroom 1
Vizi P. G. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Vizi P. G. EPO High School Research/Competition Posters, Tue, p.m., Town Center Exhibit Area
Vlasenko V. P. Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Vogel N. Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Vogel N. Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Vogt M. F. Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Vojkovic M. Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Vokrouhlicky D. Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Volf K. E. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Vollmer C. Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Volquardsen E. L. Small Bodies, Mon, a.m., Waterway Ballroom 5
Volvach Ya. S. Print Only: Moon
Von der Heydt M. O.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Von Korff J.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Vondrak R. R.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Vondrak R. R.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Vondrak R. R.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Voropaev S. A.  Print Only:  Moon
Voss K. J.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Vostrukhin A.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Vostrukhin A.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Vostrukhin A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Vrionis H.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Vucina D.  Martian Impact Crater Statistics Posters, Thu, p.m., Town Center Exhibit Area
Vuitton V.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Wada K.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Wada K.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Wada K.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Wade L. A.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wade N.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Wadhwa M.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Wadhwa M.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Wadhwa M.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Wadhwa M.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Wählisch M.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Wagner R. J.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Wagner R. V.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Wagner R. V.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Wagstaff K. L.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Wählisch M.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Wählisch M.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Waite J. H.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Waite J. H. Jr.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Wakita S.  * Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Walker C. C.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Walker D.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Walker R.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Walker R.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Walker R. G.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Walker R. G. *  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Walker R. G.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Walker R.  Achondrites, Mon, p.m., Waterway Ballroom 4
Walker R. J.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Walker R. J.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Walker R. J.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Walker R. J.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Walker R. J.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Walker R. J. *  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Walker R. J.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Walker R. J.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Wall S.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Wall S.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Wallace W. T.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Waller D. A.  * Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Walsh K. J.  * Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Walsh K. J.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Walsh K. J. * Mini-Mimas, Thu, p.m., Montgomery Ballroom
Walter S.  Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Waltson E. L.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wang A.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Wang A.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Wang A.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Wang A.  Planetary Mission Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wang A. *  Exobiology I, Thu, a.m., Waterway Ballroom 1
Wang A.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Wang C.-Y.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Wang J.  Data Tools, Access, and Archiving Posters, Tue, p.m., Town Center Exhibit Area
Wang M.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Wang W.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Wang W.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Wang X.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Wang Y.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Wang Y.  Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Wang Y.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Wang Y.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Wang Y.  Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Ward J. M.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Ward Wm. R. *  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Warner N. H. *  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Warner N. H.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Warner N. H.  Mars Fluvial Processes Posters, Thu, p.m., Town Center Exhibit Area
Warren P. H.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Warren P. H. *  Achondrites, Mon, p.m., Waterway Ballroom 4
Wartho J-A. *  Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Wasiaik F. C.  Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Wasson J. T.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Watson D. M.  Icy Surface-Atmosphere Interaction Posters, Thu, p.m., Town Center Exhibit Area
Watt N.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Watters T. R.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Watters T. R.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Watters W. A.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Watters W. A.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Wawrzaszek R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Weatherington P. H.  Print Only: Impacts
Weaver H. A.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Weaver R. P.  Asteroid Disruption Posters, Tue, p.m., Town Center Exhibit Area
Weber A. *  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Weber R. C. *  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Weeraratne D. S.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Wegel D. C.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Weidenschilling S. J.  Achondrites, Mon, p.m., Waterway Ballroom 4
Weidenschilling S. J.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Weider S. Z.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Weidinger T.  Print Only: Education and Public Outreach
Weintraub L.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Weirich J. R. *  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Weirich J. R.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Weisberg M. K.  Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Weisberg M. K.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Weisberg M. K.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Weisberg M. K. *  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Weiss B. P. *  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Weiss B. P.  Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Weiss B. P.  Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Weiss B. P.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Weiss B. P.  Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Weissman P. R.  Asteroid Geophysics and Processes, Mon, p.m., Waterway Ballroom 5
Weitz C. M.   Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Weitz C. M.   Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Weitz C. M.   Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Weitz C. M.   Geology of Martian Impact Crater Posters, Thu, p.m., Town Center Exhibit Area
Wela S.   Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Welivitiya W. D. D. P.   Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
Weller L. A.   Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Wetzel K. C.   Achromatics, Mon, p.m., Waterway Ballroom 4
Wetzel K. C.   Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wetzenbach L.   Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wetzenbach L. C.   Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wendi L.   Geology of Martian Impact Crater Posters, Thu, p.m., Town Center Exhibit Area
Wendi L.   Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Wennberg P. O.   Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wentworth S. J.   Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Wentworth S. J.   Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Wenzel K.-P.   Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Wess A.   EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Wess A. S.   Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Wess A. S.   EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
West M.   Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
West R. A.   Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Westall F.   Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Westall F.   Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Westenberg A.   Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Westphal A. J.   Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Westphal A. J.   Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Wetz A.   Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Whalley P. C.   EPO Moon Posters, Tue, p.m., Town Center Exhibit Area
Wheeler T. D.   EPO Training the Next Generation Posters, Tue, p.m., Town Center Exhibit Area
Whelley P. L.   Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
White L. M.   Exobiology Posters, Thu, p.m., Town Center Exhibit Area
White O. L.   Mini-Mimas, Thu, p.m., Montgomery Ballroom
White O. L.   Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Whiteway J. A.   Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Whitten J. L.   Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Whitten J. L.   Mars Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Whyte L.   Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Wibben D.   Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Wibben D.   Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Wieczorek M.   Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Wieczorek M. A.   Thermal and Magmatic Evolution Posters, Tue, p.m., Town Center Exhibit Area
Wieczorek M. A.   Print Only: Missions, Instruments, and Payload Concepts
Wieczorek M. A.   Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Wieczorek M. A.   Thermal and Magmatic Evolution Posters, Thu, p.m., Town Center Exhibit Area
Wieczorek M. A.   Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Wieczorek M. A.   The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Wieczorek M. A. *   Lunar Impacts II, Fri, p.m., Waterway Ballroom 6
Wieler R.   Achromatics, Mon, p.m., Waterway Ballroom 4
Wieler R.   Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Wieler R.   Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Wieler R.   Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Wieler R.   Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Wieler R.   Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Wieler R.   Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wieler R.   Organics and Volatiles in Chondritic Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Wieler R.   Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Wielicki M. M. *   Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Wiens R.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Wiens R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wiens R. C.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Wiens R. C.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Wiens R. C.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Wiens R. C.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Wiens R. C.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Wiens R. C.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wiens R. C.  Early Solar System Reservoirs III, Fri, a.m., Waterway Ballroom 4
Wieser M.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Wilhelms D. E.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Wilkins G.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Williams A. J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Williams B.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Williams C. D.  SNC Meteorites Posters, Thu, p.m., Town Center Exhibit Area
Williams D. A.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Williams D. A.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Williams D. A.  Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Williams D. A.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Williams D. R.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Williams D. R.  EPO Community Engagement Posters, Tue, p.m., Town Center Exhibit Area
Williams E.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Williams H. M.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Williams J.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Williams J. G.  Print Only: Missions, Instruments, and Payload Concepts
Williams J. G.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Williams J. L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Williams J. P.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Williams J.-P.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Williams K. K.  Environmental Analogos Posters, Tue, p.m., Town Center Exhibit Area
Williams L. B.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Williams N. R.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Williams N. R.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Williams Q.  Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Williams R. W.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Williamson P.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Willis K. J.  EPO K–12 Resources Posters, Tue, p.m., Town Center Exhibit Area
Willmes M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Willmes M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Willner K.  Asteroid Photogeology Posters, Tue, p.m., Town Center Exhibit Area
Wilson B.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Wilson J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wilson J. H. * Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Wilson J. H.  Igneous Geochemistry Posters, Thu, p.m., Town Center Exhibit Area
Wilson J. K.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Wilson L.  Print Only: Mars
Wilson L.  Achondrites, Mon, p.m., Waterway Ballroom 4
Wilson L.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Wilson L.  Mars: Large Volcanos and Flows Posters, Tue, p.m., Town Center Exhibit Area
Wilson L.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Wilson L.  Acid vs. Alkaline, Thu, p.m., Waterway Ballroom 1
Wilson L.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Wilson L.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Wilson L.  Igneous Processes Posters Posters, Thu, p.m., Town Center Exhibit Area
Wilson L.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Wilson R.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Wilson S. A. * Exobiology I, Thu, a.m., Waterway Ballroom 1
Wilson S. A.  Martian Fanclub Posters, Thu, p.m., Town Center Exhibit Area
Wilson T. L.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Wimmer-Schweingruber R. F.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Wimpenney J. B. * Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Wimpenney J. B.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Winarski R.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Winebrenner D. P. * Special Session: Cryospheres I, Mon, a.m., Waterway Ballroom 1
Winebrenner D. P.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Wing B.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Wingler R.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wingo D. R.  Moon Apollo-Lunokhod Legacy Posters, Tue, p.m., Town Center Exhibit Area
Winterhalter D.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Wintzer A. E.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Wirick S.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Wirick S.  Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Wirick S.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
WISE Team  Asteroid Studies Posters, Tue, p.m., Town Center Exhibit Area
WISE Team  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Wiseman S.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Wiseman S.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Wiseman S. S. Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Wiseman S. M.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Wisniewski L. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Withers A. C. Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Wittig N.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Wittke J. H.  A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Wittke J. H.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Wittmann A. Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Wittmann A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Wittmann A.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wittmann A.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Wittmann A. * Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Wöhrle J. Lunar Impacts I, Fri, p.m., Waterway Ballroom 6
Wöhler C.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Wöhler C.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Wöhler C.  Print Only: Moon
Wojciechowski J. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wojcikowski M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wolf L. W.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wolf U.  Icy Surfaces and Interiors Posters, Thu, p.m., Town Center Exhibit Area
Wolf M. Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Wolf M. J.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Wolf M. J. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wong R. Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wood C. A.  Titan Everything Posters, Tue, p.m., Town Center Exhibit Area
Wood C. A. Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Wood C. A.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Wood L.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Wood S. E.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Wood S. E.  Mars Geomorphology: Fluvial, Fri, a.m., Waterway Ballroom 1
Wooden D. H.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Wooden J. Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wooden J. Shocked Mineral Grains, Wed, p.m., Montgomery Ballroom
Woolum D. S. Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Wopenka B. Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Wordsworth N. Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Wozniakiewicz P. J.  Print Only: Interplanetary and Presolar Dust
Wray J. Brines, Gullies, and the Cryosphere, Thu, p.m., Waterway Ballroom 1
Wray J.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Wray J. Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Wray J. Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Wray J.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wray J. J. Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Wray J. J. Mars Alteration, Wed, p.m., Waterway Ballroom 1
Wray J. J. Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Wray J. J. Geology of Martian Crater Profiles, Thu, p.m., Town Center Exhibit Area
Wray J. J.  Mars Aeolian Processes, Fri, a.m., Waterway Ballroom 1
Wright D. M.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Wright E.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Wright E. L.  Small Bodies, Mon, a.m., Waterway Ballroom 5
Wright E. L.  Special Session: Comet Hartley 2 and Related Bodies II, Wed, p.m., Waterway Ballroom 5
Wright E. L.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Wright S.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Wright S. P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wright S. P.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Wright S. P.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Wu F.-Y.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Wu F.-Y.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Wu Y. Z.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Wu Z. H.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Wulf G.  Geology of Martian Impact Craters Posters, Thu, p.m., Town Center Exhibit Area
Wünnemann K.  Impacts: Modeling and Remote Sensing, Tue, p.m., Waterway Ballroom 5
Wünnemann K.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Wünnemann K.  Impact Experiments, Wed, a.m., Montgomery Ballroom
Wünnemann K.  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Wurm G.  Print Only: Cosmochemical Origins
Wurz P.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Wyatt M. B.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Wyatt M. B.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Wyatt M. B.  Field and Laboratory Analogs Posters, Thu, p.m., Town Center Exhibit Area
Wyatt M. C.  Small Bodies Posters, Thu, p.m., Town Center Exhibit Area
Wynne J. J.  Martian Pits and Caves Posters, Thu, p.m., Town Center Exhibit Area
Wyrick D. Y. *  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Xiao L.  Print Only: Mars
Xiao Z.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Xie Z.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Yabuta H.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Yabuta H.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yada T.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Yada T. *  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yagishita M.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Yakovlev O. I.  The Dust Bin Posters, Thu, p.m., Town Center Exhibit Area
Yakovlev V. V.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Yakovlev V. V.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Yakovleva M.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Yamada A.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Yamada A.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Yamaguchi A.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Yamaguchi A.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Yamaguchi A.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Yamaguchi A.  Planetary Differentiation Posters, Thu, p.m., Town Center Exhibit Area
Yamamoto A.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Yamamoto A.  Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Yamamoto A.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Yamamoto M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yamamoto S.  Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Yamamoto S.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Yamamoto S.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Yamamoto T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Yamamoto N.  Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Yamashita N.  Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Yamashita N.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Yamashita S.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Yan B. K.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Yan J.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Yan J.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Yan L.
Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Yan L.
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Yang H.
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Yang H. W.
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Yang J.
Planetary Differentiation, Thu, a.m., Waterway Ballroom 6
Yang L.
Cosmochemical Origins I Posters, Tue, p.m., Town Center Exhibit Area
Yano H.
Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Yano H.
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Yano H.
Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yano H.
Dusty Horizons I Posters, Thu, p.m., Town Center Exhibit Area
Yao L.
Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Yao N.
Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Yasui M.
Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Yasui Y.
Giant Planets and Rings Posters, Thu, p.m., Town Center Exhibit Area
Yeh P. S.
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Yeoh S. K.
Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Yff J.
Volcanism in the Outer Solar System Posters, Thu, p.m., Town Center Exhibit Area
Yilmaz A.
Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Yin A. *
Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Yin A.
Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Yin Q.-Z.
Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Yin Q.-Z.
Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Yin Q.-Z.
Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Yin Q.-Z. *
Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Yingst R. A.
Education and Public Outreach, Tue, p.m., Montgomery Ballroom
Yingst R. A.
Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Yingst R. A.
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Yingst R. A.
A Pre-Dawn Perspective Posters, Thu, p.m., Town Center Exhibit Area
Yingst R. A.
Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Yingst R. A.
Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Yokochi R.
Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Yokota Y.
Formation and Evolution of the Moon II, Tue, a.m., Waterway Ballroom 6
Yokota Y.
Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Yokota Y.
Lunar Crust Remote Sensing Posters, Tue, p.m., Town Center Exhibit Area
Yokota Y.
Composition of the Lunar Crust, Wed, a.m., Waterway Ballroom 6
Yokota Y.
Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Yokota Y.
Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Yokotaya E.
Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Yokotaya T.
Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Yokotaya T. *
Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Yoon SY.
Mars Data Analysis Posters, Thu, p.m., Town Center Exhibit Area
Yoshikawa M.
Early Solar System I Posters, Thu, p.m., Town Center Exhibit Area
Yoshikawa M.
Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yoshinobu A. S.
Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Young A.
Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Young D. T.
Icy Surface-Atmosphere Interaction Posters, Tue, p.m., Town Center Exhibit Area
Young E.
Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Young E. D. *
Cosmochemical Origins I, Mon, a.m., Waterway Ballroom 4
Young E. D.
Cosmochemical Origins II, Tue, p.m., Waterway Ballroom 4
Young E. D.
Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Young E. D.
Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Young E. D.
Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Young K.
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Young K. E.
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Young K. E.
Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Young K. E.
Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Younse P.
Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Yu G.
Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Yu G.
Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Yun E. H.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Yun S.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Yurimoto H.  Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Yurimoto H.  Cosmochemical Origins II Posters, Tue, p.m., Town Center Exhibit Area
Yurimoto H.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Yurimoto H.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Yurimoto H.  * Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Zabrusky K. J.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Zacny K.  Martian Ground Ice Posters, Tue, p.m., Town Center Exhibit Area
Zacny K.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Zahnle K.  * Carbon on Mars, Tue, p.m., Waterway Ballroom 1
Zahnle K. Z.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Zanda B.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Zanda B.  * Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Zanetti M.  Terrestrial Impact Craters, Tue, a.m., Waterway Ballroom 5
Zanetti M.  Impacts II Posters, Tue, p.m., Town Center Exhibit Area
Zanetti M.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Zanetti M.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Zanetti M.  Crusty Mars Posters, Thu, p.m., Town Center Exhibit Area
Zanetti M.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Zega T. J.  * Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Zega T. J.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Zega T. J.  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Zegers T.  Materials Analogs Posters, Thu, p.m., Town Center Exhibit Area
Zegers T.  Martian Layered Deposits Posters, Tue, p.m., Town Center Exhibit Area
Zegers T.  Mars Sediments, Wed, a.m., Waterway Ballroom 1
Zeigler R. A.  * Formation and Evolution of the Moon III, Tue, p.m., Waterway Ballroom 6
Zeigler R. A.  Lunar Crust Samples Posters, Tue, p.m., Town Center Exhibit Area
Zeitlin C.  Mars Instruments Posters, Thu, p.m., Town Center Exhibit Area
Zelenyi L. M.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Zelin S. L.  Exobiology II, Thu, a.m., Waterway Ballroom 1
Zellner N. E. B.  * Exobiology II, Thu, a.m., Waterway Ballroom 1
Zellner N. E. B.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Zent A. P.  * Special Session: Cryospheres II, Tue, a.m., Waterway Ballroom 1
Zent A. P.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Zent A. P.  Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Zevin D.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Zevin D.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Zhang A. C.  * Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Zhang F.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Zhang G. L.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Zhang H.  Materials Analogs Posters, Tue, p.m., Town Center Exhibit Area
Zhang J.  * Formation and Evolution of the Moon I, Mon, p.m., Waterway Ballroom 6
Zhang J.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Zhang S.  * Lunar Surface and Volatiles, Thu, p.m., Waterway Ballroom 6
Zhang S.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Zhang T. L.  Atmospheres: Observations and Processes Posters, Tue, p.m., Town Center Exhibit Area
Zhang W. X.  Samples and Spectroscopy Posters, Tue, p.m., Town Center Exhibit Area
Zhang Y.  * Special Session: Planetary Magmatic Volatiles, Mon, a.m., Waterway Ballroom 6
Zhao J. Y.  Instrument and Payload Concepts Posters, Thu, p.m., Town Center Exhibit Area
Zhao W. J.  Planetary Mission Concepts Posters, Tue, p.m., Town Center Exhibit Area
Zhao X.  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Zhao X.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Zhao Y.  Mars Alteration Posters, Thu, p.m., Town Center Exhibit Area
Zhavaleta J.  Exobiology Posters, Thu, p.m., Town Center Exhibit Area
Zheng M. P.  Exobiology I, Thu, a.m., Waterway Ballroom 1
Zheng Y.-C.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Zhong S.  Mare Basalts from Source to Eruption, Wed, p.m., Waterway Ballroom 6
Zhong S.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Zhong S.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area

352  42nd LPSC Program Index
Zhong S. J. *  Planetary Dynamics and Tectonics, Thu, a.m., Waterway Ballroom 5
Zhou C.  Print Only:  Moon
Zhou F.  Mars Rovers and Landers Posters, Tue, p.m., Town Center Exhibit Area
Zhou Q.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Zhou Q.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Zhu M.-H.  Impact Processes on Mars Posters, Thu, p.m., Town Center Exhibit Area
Ziegler K.  Iron Meteorites and Pallasites Posters, Tue, p.m., Town Center Exhibit Area
Ziegler K.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Zimbelman J. R.  Mars: Terrestrial Analogs Posters, Tue, p.m., Town Center Exhibit Area
Zimbelman J. R.  Environmental Analogs Posters, Tue, p.m., Town Center Exhibit Area
Zimbelman J. R.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Zimbelman J. R.  The Medusae Fossae Formation Posters, Thu, p.m., Town Center Exhibit Area
Zimbelman J. R.  Igneous Processes Posters, Thu, p.m., Town Center Exhibit Area
Zimmerman M. E.  Planetary Dynamics and Tectonics Posters, Thu, p.m., Town Center Exhibit Area
Zimmerman M. I.  Mars Aeolian Processes Posters, Thu, p.m., Town Center Exhibit Area
Zimmerman M. I.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Zimmerman-Brachman R.  EPO Scientist Engagement Posters, Tue, p.m., Town Center Exhibit Area
Zinenko V. I.  Print Only:  Moon
Zinner E. *  Unraveling the Origins of Presolar Grains, Tue, a.m., Waterway Ballroom 4
Zinner E.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Zinner E.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Zinovev A. V.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Zinovev A. V.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Zipfel J.  Print Only:  Cosmochemistry Print Only
Zipfel J.  Presolar Grains Posters, Tue, p.m., Town Center Exhibit Area
Zipfel J.  Primitive Meteorites I Posters, Thu, p.m., Town Center Exhibit Area
Zolensky M.  Achondrites Posters, Tue, p.m., Town Center Exhibit Area
Zolensky M.  Early Solar System Reservoirs I, Wed, a.m., Waterway Ballroom 4
Zolensky M.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Zolensky M.  Primitive Meteorites II Posters, Thu, p.m., Town Center Exhibit Area
Zolensky M. E.  Achondrites, Mon, p.m., Waterway Ballroom 4
Zolensky M. E.  Early Solar System I Posters, Tue, p.m., Town Center Exhibit Area
Zolensky M. E.  Impacts I Posters, Tue, p.m., Town Center Exhibit Area
Zolensky M. E.  Special Session: Results from Hayabusa!, Thu, a.m., Waterway Ballroom 4
Zolensky M. E.  Dusty Horizons, Thu, p.m., Waterway Ballroom 4
Zolensky M. E.  Primitive Meteorites I, Thu, p.m., Waterway Ballroom 5
Zolensky M. E.  Dusty Horizons II Posters, Thu, p.m., Town Center Exhibit Area
Zolensky M. E.  Vesta and HEDs, Fri, a.m., Waterway Ballroom 5
Zolensky M. E.  Lunar Impacts I, Fri, a.m., Waterway Ballroom 6
Zolotov M.  Early Solar System II Posters, Tue, p.m., Town Center Exhibit Area
Zolotov M.  Early Solar System Reservoirs II, Wed, p.m., Waterway Ballroom 4
Zolotov M. Yu. *  Primitive Meteorites II, Fri, p.m., Waterway Ballroom 4
Zorzano-Mier M. P.  Print Only: Exobiology
Zou Y. L.  Moon Missions and Samples Posters, Thu, p.m., Town Center Exhibit Area
Zuber M. T.  Mercury, Mon, p.m., Waterway Ballroom 1
Zuber M. T.  Venus Posters, Tue, p.m., Town Center Exhibit Area
Zuber M. T.  Lunar Impacts Posters, Thu, p.m., Town Center Exhibit Area
Zuber M. T.  Moon Datasets Posters, Thu, p.m., Town Center Exhibit Area
Zuber M. T.  The Moon as an Airless Body Posters, Thu, p.m., Town Center Exhibit Area
Zuber M. T.  Moon Remote Sensing Posters, Thu, p.m., Town Center Exhibit Area
Zuber M. T.  Print Only: Missions, Instruments, and Payload Concepts