



**SUDBURY
1992**

LARGE METEORITE IMPACTS AND PLANETARY EVOLUTION

Sudbury, Ontario, Canada
August 31 – September 2, 1992

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Monday, August 31, 1992
IMPACT CRATERING AND PLANETARY EVOLUTION
8:15 a.m. – 4:50 p.m.
Room A

*** Denotes Speaker**

- Chair:** C. J. A. Coates
- 8:15 – 8:30 Dressler B. O.*
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- 8:30 – 8:50 Spudis P. D.*
The Large Impact Process Inferred from the Geology of Lunar Multi-Ring Basins
- 8:50 – 9:10 Wichman R. W.* Schultz P. H.
Variation in Multi-Ring Basin Structures as a Function of Impact Angle
- 9:10 – 9:30 Schultz P. H.* Gault D. E.
Recognizing Impactor Signatures in the Planetary Record
- 9:30 – 9:50 Hamilton W. B.*
Venusian Impact Basins and Cratered Terrains
- 9:50 – 10:10 O'Keefe J. D.* Ahrens T. J.
Melting and Its Relationship to Impact Crater Morphology
- 10:10 – 10:30 Coffee Break
- 10:30 – 11:00 Cintala M. J.* Grieve R. A. F.
Melt Production in Large-Scale Impact Events: Planetary Observations and Implications
 Cintala M. J. Grieve R. A. F.
Melt Production in Large-Scale Impact Events: Calculations of Impact-Melt Volumes and Crater Scaling
 Grieve R. A. F. Cintala M. J.
Melt Production in Large-Scale Impact Events: Implications and Observations at Terrestrial Craters
- 11:00 – 11:20 Ryder G.* Dalrymple G. B.
Apollo 15 Impact Melts, The Age of Imbrium, and the Earth-Moon Impact Cataclysm
- 11:20 – 11:40 Glikson A. Y.*
Asteroids and Archaean Crustal Evolution: Tests of Possible Genetic Links Between Major Mantle/Crust Melting Events and Clustered Extraterrestrial Bombardments
- 11:40 – 12:00 Dietz R. S.* McHone J. F.
Noril'sk/Siberian Plateau Basalts and Bahama Hot Spot: Impact Triggered?

12:00 – 1:30 Lunch

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- 1:30 – 1:50 Koeberl C.* Reimold W. U. Boer R. H.
Early Archean Spherule Beds of Possible Impact Origin from Barberton, South Africa: A Detailed Mineralogical and Geochemical Study
- 1:50 – 2:10 Simonson B. M.*
Geological Evidence for a 2.6 Ga Strewn Field of Impact Spherules in the Hamersley Basin of Western Australia
- 2:10 – 2:30 Dowling K.* Keays R. R. Wallace M. W. Gostin V. A.
Mobilization of the Platinum Group Elements by Low Temperature Fluids: Implications for Mineralization and the Iridium Controversy
- 2:30 – 2:50 Evans N. J.* Goodfellow W. D. Gregoire D. C. Veizer J.
Ruthenium/Iridium Ratios in the Cretaceous-Tertiary Boundary Clay: Implications for Global Dispersal and Fractionation Within the Ejecta Cloud
- 2:50 – 3:10 Bohor B. F.*
Large Meteorite Impacts: The K/T Model
- 3:10 – 3:30 Coffee Break
- 3:30 – 3:50 Shoemaker E. M.* Izett G. A.
K/T Boundary Stratigraphy: Evidence for Multiple Impacts and a Possible Comet Stream
- 3:50 – 4:10 Krogh T. E.* Kamo S. L. Bohor B. F.
U-Pb Isotopic Results for Single Shocked and Polycrystalline Zircons Record 550–65.5 Ma Ages for a K-T Target Site and 2700–1850 Ma Ages for the Sudbury Impact Event
- 4:10 – 4:30 Trieloff M.* Jessberger E. K.
⁴⁰Ar-³⁹Ar Ages of the Large Impact Structures Kara and Manicouagan and Their Relevance to the Cretaceous-Tertiary and Triassic-Jurassic Boundary
- 4:30 – 4:50 Basilevsky A. T.* Yakovlev O. I.
Geochemical Aspect of Impact of Cratering: Studies in Vernadsky Institute

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SHOCK METAMORPHISM AND CRATERING MECHANICS
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- 8:50 – 9:10 McKinnon W. B.* Alexopoulos J. S.
What Can We Learn About Impact Mechanics from Large Craters on Venus?
- 9:10 – 9:30 Sharpton V. L.*
Paradigm Lost: Venus Crater Depths and the Role of Gravity in Crater Modification
- 9:30 – 9:50 Ivanov B. A.*
Geomechanical Models of Impact Cratering: Puchezh-Katunki Structure
- 9:50 – 10:10 Spray J. G.*
Viscosity Determinations of Some Frictionally-Generated Silicate Melts: Implications for Slip Zone Rheology During Impact-Induced Faulting
- 10:10 – 10:30 Coffee Break
- 10:30 – 10:50 Crawford D. A.* Schultz P. H.
Enhanced Magnetic Field Production During Oblique Hypervelocity Impacts
- 10:50 – 11:10 Gratz A. J.*
Optical and TEM Study of Shock Metamorphism from the Sedan Test Site
- 11:10 – 11:30 Langenhorst F.* Deutsch A.
Influence of the Pre-Shock Temperature on Shock Effects in Quartz
- 11:30 – 11:50 Martinez I.* Guyot F. SchLrer U.
Phase Transformations in 40–60 GPa Shocked Gneisses from the Haughton Crater (Canada): An Analytical Transmission Electron Microscope (ATEM) Study
- 11:50 – 1:30 Lunch

- Chair: P. Spudis**
- 1:30 – 1:50 Feldman V. I.*
Diaplectic Transformation of Minerals: Vorotilov Drill Core, Puchezh-Katunki Impact Crater, Russia
- 1:50 – 2:10 Agrinier P.* Martinez I. Javoy M. Schärer U.
Carbon and Oxygen Isotope Study of Carbonates from Highly Shocked Clasts of the Polymict Breccia of the Haughton Crater (Canada)
- 2:10 – 2:30 Hawke B. R.* Head J. W.
The Distribution and Modes of Occurrence of Impact Melt at Lunar Craters
- 2:30 – 2:50 Masaitis V. L.*
Impactites from Popigai Crater
- 2:50 – 3:10 Bringemeier D.*
Suevite Superposition on the Bunte Breccia in Nördlinger Ries/Germany—New Findings on the Transport Mechanism of Impactites
- 3:10 – 3:30 Coffee Break

Structures Under Investigation

- 3:30 – 3:50 Chan C.* Wu S. Luo X.
Hong Kong is an Impact Crater—Proof from the Geomorphological and Geological Evidences
- 3:50 – 4:10 Lindstrom M.* Puura V. Flodén T. Bruun P.
Ordovician Impacts at Sea in Baltoscandia
- 4:10 – 4:30 Pesonen L. J.* Henkel H.
Impact Cratering Record of Fennoscandia
- 4:30 – 4:50 Elston W. E.*
Does the Bushveld-Vredefort System (South Africa) Record the Largest Known Terrestrial Impact Catastrophe?

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TERRESTRIAL IMPACT CRATERS
8:30 a.m. – 5:00 p.m.
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Structural Aspects of the Araguainha Impact Structure (Brazil)
- 8:50 – 9:10 Anderson R. R.* Hartung J. B. Roddy D. J.
 Shoemaker E. M.
Research Core Drilling in the Manson Impact Structure, Iowa
- 9:10 – 9:30 Gostin V. A.* Keays R. R. Wallace M. W.
The Acraman Impact and its Widespread Ejecta, South Australia
- 9:30 – 9:50 Garvin J. B.* Deino A. L.
New Perspectives on the Popigai Impact Structure
- 9:50 – 10:20 Hargraves R. B.*
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 Fiske P. S. Hougren S. B. Hargraves R. B.
Breccia Dikes from the Beaverhead Impact Structure, Southwest Montana
- 10:20 – 10:40 Coffee Break

Vredefort Structure

- 10:40 – 11:00 Reimold W. U.*
The Vredefort Dome—Review of Geology and Deformation Phenomena and Status Report on Current Knowledge and Remaining Problematics (Five Years After the Cryptoexplosion Workshop)
 Reimold W. U. Colliston W. P.
The Pseudotachylites from the Vredefort Structure and the Witwatersrand Basin
- 11:00 – 11:20 Therriault A. M.* Reid A. M.
"Bronzite" Granophyre: New Insight on Vredefort
- 11:20 – 11:40 White J. C.*
Electron Petrography of Silica Polymorphs Associated With Pseudotachylite, Vredefort Structure, South Africa
- 11:40 – 12:00 Thompson L. M.* Spray J. G.
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- 12:00 – 1:30 Lunch

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Sudbury Structure

- 1:50 – 3:10 Müller-Mohr V.*
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- Avermann M. E. Bischoff L. Brockmeyer P.
 Buhl D. Deutsch A. Dressler B. O. Lakomy R.
 Müller-Mohr V. Stöffler D.*
Sudbury Project (University of Münster-Ontario Geological Survey): (1) Summary of Results—An Updated Impact Model
- Bischoff L.* Dressler B. O. Avermann M. E.
 Brockmeyer P. Lakomy R. Müller-Mohr V.
Sudbury Project (University of Münster-Ontario Geological Survey): (2) Field Studies 1984-1989—Summary of Results
- Stöffler D.* Deutsch A. Avermann M.
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Sudbury Project (University of Münster-Ontario Geological Survey): (3) Petrology, Chemistry, and Origin of Breccia Formations
- Deutsch A.* Buhl D. Brockmeyer P. Lakomy R.
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- Avermann M. E.*
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- Buhl D.* Deutsch A. Lakomy R. Brockmeyer P.
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- 3:30 – 3:50 Cowan E. J.* Schwerdtner W. M.
Intrusive Origin of the Sudbury Igneous Complex: Structural and Sedimentological Evidence

- 3:50 – 4:10 James R. S.* Peredery W. Sweeny J. M.
*Thermobarometric Studies on the Levack Gneisses-Footwall
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- 4:10 – 4:30 Lowman P. D. Jr.*
Impact Origin of the Sudbury Structure: Evolution of a Theory
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Imaging Radar Investigations of the Sudbury Structure
- 4:30 – 5:00 Panel Discussion

Monday, August 31, 1992 – Wednesday, September 2, 1992

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Structural Review of the Vredefort Dome
- Degenhardt J. J. Jr. Buchanan P. C. Reid A. M.
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- Garvin J. B. Schnetzler C. C.
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- Gratz A. J. Nellis W. J.
*Simulated Meteorite Impacts and Volcanic Explosions: Ejecta Analyses and
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- Hartung J. Koeberl C. Lee P. Pagnacith K. Sambath T.
Report on the International Cambodian Crater Expedition—1992
- Henkel H. Liljequist R.
*Large Impacts in the Baltic Shield with Special Attention to the
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*Search for a Meteoritic Component at the Beaverhead Impact
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- Nayak V. K.
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- Rajlich P.
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- Singhroy V. Mussakowski R. Dressler B. O. Trowell N. F.
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- Schnetzler C. C. Garvin J. B.
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- Underwood J. R. Jr.
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- Vrana S.
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- Wu S. Zhang J.
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- Norman M. D.
Sudbury Igneous Complex: Impact Melt or Igneous Rock? Implications for Lunar Magmatism
- Trieloff M. Reimold W. U. Kunz J. Jessberger E. K. Boer R. H.
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⁴⁰Ar-³⁹Ar Dating of Pseudo Tachylites from the Witwatersrand Basin, South Africa, with Implications for the Formation of the Vredefort Dome

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McKinnon W. B.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Müller-Mohr V.	Terres. Impact Craters, Wed., Rm. A
Mussakowski R.	Posters, Mon.-Wed., Rm. B
Nayak V. K.	Posters, Mon.-Wed., Rm. B
Nellis W. J.	Posters, Mon.-Wed., Rm. B
Norman M. D.	Title Only
O'Keefe J. D.	Impact Cratering/Planetary Evol., Mon., Rm. A
Pagnacith K.	Posters, Mon.-Wed., Rm. B
Peredery W. V.	Posters, Mon.-Wed., Rm. B
Peredery W. V.	Terres. Impact Craters, Wed., Rm. A

Pesonen L. J.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Puura V.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Rajlich P.	Posters, Mon.-Wed., Rm. B
Reid A. M.	Terres. Impact Craters, Wed., Rm. A
Reid A. M.	Posters, Mon.-Wed., Rm. B
Reimold W. U.	Title Only
Reimold W. U.	Impact Cratering/Planetary Evol., Mon., Rm. A
Reimold W. U.	Posters, Mon.-Wed., Rm. B
Reimold W. U.	Terres. Impact Craters, Wed., Rm. A
Revetta F. A.	Posters, Mon.-Wed., Rm. B
Roddy D. J.	Terres. Impact Craters, Wed., Rm. A
Ryder G.	Impact Cratering/Planetary Evol., Mon., Rm. A
Ryder G.	Posters, Mon.-Wed., Rm. B
Sambath T.	Posters, Mon.-Wed., Rm. B
Schärer U.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Schnetzler C. C.	Posters, Mon.-Wed., Rm. B
Schultz P. H.	Impact Cratering/Planetary Evol., Mon., Rm. A
Schultz P. H.	Posters, Mon.-Wed., Rm. B
Schultz P. H.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Schwerdtner W. M.	Terres. Impact Craters, Wed., Rm. A
Sharpton V. L.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Shoemaker E. M.	Impact Cratering/Planetary Evol., Mon., Rm. A
Shoemaker E. M.	Terres. Impact Craters, Wed., Rm. A
Simonson B. M.	Impact Cratering/Planetary Evol., Mon., Rm. A
Singhroy V. H.	Terres. Impact Craters, Wed., Rm. A
Singhroy V. H.	Posters, Mon.-Wed., Rm. B
Slaney V. R.	Terres. Impact Craters, Wed., Rm. A
Spray J. G.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Spray J. G.	Terres. Impact Craters, Wed., Rm. A
Spudis P. D.	Impact Cratering/Planetary Evol., Mon., Rm. A
Stöffler D.	Terres. Impact Craters, Wed., Rm. A
Sweeny J. M.	Terres. Impact Craters, Wed., Rm. A
Swietlik R.-M.	Terres. Impact Craters, Wed., Rm. A
Therriault A. M.	Terres. Impact Craters, Wed., Rm. A
Thompson L. M.	Terres. Impact Craters, Wed., Rm. A
Trielloff M.	Impact Cratering/Planetary Evol., Mon., Rm. A
Trielloff M.	Title Only
Trowell N. F.	Posters, Mon.-Wed., Rm. B
Underwood J. R. Jr.	Posters, Mon.-Wed., Rm. B
Veizer J.	Impact Cratering/Planetary Evol., Mon., Rm. A
Vrana S.	Posters, Mon. - Wed., Rm. B
Wallace M. W.	Impact Cratering/Planetary Evol., Mon., Rm. A
Wallace M. W.	Terres. Impact Craters, Wed., Rm. A
Wang K.	Shock Metamorph./Cratering Mech., Tue., Rm. A
White J. C.	Terres. Impact Craters, Wed., Rm. A
Wichman R. W.	Impact Cratering/Planetary Evol., Mon., Rm. A
Wichman R. W.	Posters, Mon.-Wed., Rm. B
Wright S. F.	Posters, Mon.-Wed., Rm. B
Wu S.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Wu S.	Posters, Mon.-Wed., Rm. B
Yakovlev O. I.	Shock Metamorph./Cratering Mech., Tue., Rm. A
Zhang J.	Posters, Mon.-Wed., Rm. B