LUNAR AND PLANETARY INSTITUTE
3303 NASA ROAD 1 HOUSTON, TEXAS 77058 CABLE ADDRESS: LUNSI

CONFERENCE OFFICE
(713) 486-2150

**LPI Topical Conference on**

# CHONDRULES AND THEIR ORIGINS

**November 15-18, 1982**

FIRST ANNOUNCEMENT

The Lunar and Planetary Institute is organizing a Topical Conference on meteoritic, lunar and terrestrial chondrules and their origins. The meeting will be held at the Lunar and Planetary Institute, Houston, Texas, November 15 through 18, 1982.

Chondrules comprise a wide variety of fundamental particles in chondrites and achondrites. They display a range of petrographic textures, mineral chemistries, chemical and isotopic compositions, grain size and other properties that are truly impressive, and which may indicate a variety of origins and histories. Chondrules are some of the oldest objects in the solar system but are not necessarily all of the same age, and some chondrules may have inherited chemical and isotopic characteristics and possibly even solid grains from older pre-solar materials. These objects are a major component of most stony meteorites, have been recorded as a relatively minor component of a number of lunar samples, and are reported from the ejecta deposits of some terrestrial impact craters. Glassy spherules which are common constituents of the lunar regolith and which also have been found in several regolith meteorites may be analogous to some chondrules in ordinary and carbonaceous chondrites and may have similar origins. The bewildering array of chondrule properties has continued to stimulate debate relative to their origins since they were first examined with the microscope and simple analytical methods in the last century. More than thirty different origins for chondrules have been proposed. However, with the current level of activity in this area of research and the accumulated knowledge and data of the past few decades, it appears that we now have an opportunity to resolve some of the major questions concerning chondrules and their origins.

This conference is designed to attract informed scientists who have worked in this area of research or who wish to contribute to it. Attendance will be limited to 120 participants, as this is the maximum number that can be comfortably accomodated within the conference facilities of the LPI. Preference will be given to potential attendees who indicate that they wish to participate in the program. The format of the program is planned to promote discussion and exchange of ideas. Invited discussion leaders will introduce topics with presentations of as much as 30 minutes to be followed by informal contributions of no more than 5 minutes each by any number of conference participants. These short contributions may be illustrated by slides and/or other audio-visual aids. We hope that participants with a wide diversity of views and opinions will come prepared to fully discuss their ideas and the evidence for and against them in the most informal and congenial of atmospheres. We hope that this format of open exchange will help to clarify the major questions that confront us as a community interested in chondrules and chondrites. Such discussions should also help to point the way to useful new areas of research and joint work between different investigators and laboratories.

The broad organization of the program will center around three major topics: Chondrule Parent Materials, Chondrule Formation and Post-Formational History. We expect discussions and contributions within this general framework involving mineralogy-petrology, geochemistry, geochronology, isotopic measurements, physical measurements, experimental studies and theoretical studies.

We anticipate that the following questions (among others) may be addressed:

1. **Textures and Mineral Chemistries:**
   What is the nature of chondrule rims? Where and how did they form? How did chondrules with non-igneous textures form? What is the meaning of equilibration in chondrites? When did it occur? How many textural types of chondrules are there? What do the textures mean? Is there evidence that chondrules with igneous textures formed by different processes?

2. **Major, Minor and Trace Element Chemistries:**
   Are there chemically distinct populations of chondrules? Do chondrule chemistries correlate with other chondrule properties? Is there any evidence for vapor fractionations? Do all chondrules have a high temperature history? What is the nature and extent of post-formational chemical alteration?

3. **Isotopic Measurements and Chronology:**
   What is the range of individual chondrule ages? Are chondrules older or younger than the matrix in which they are contained? How do the Ca-Al-rich chondrules relate to other chondrules with igneous textures? What portion of chondrules show evidence for inclusion of pre-solar materials? What constraints are placed on chondrule formation by isotopic measurements?

4. **Grain Size, Shape, Surface Features, Physical Measurements:**
   What is the range of size characteristics in chondrule populations? How did they originate and what do they mean? Are the petrofabrics of chondrules accretional or due to later deformation? How abundant are various surface features on chondrules and what do they mean? How non-spherical are chondrules and what process caused this?

5. **Accretion of Chondrules:**
   At what temperature were chondrules accreted onto their parent bodies? What was the process of accretion and when did it occur relative to the formation of the chondrules themselves? What was the effect of accretion on other chondrule properties? How do observations of multiple or compound chondrules constrain accretion?

6. **Theoretical and Experimental Studies of Chondrule Formation:**
   What conditions of chondrule formation are best known or best modeled? What conditions of the early solar nebula, planetesimal surface or other environment need to be better determined to improve formation models? What are the observational data that support or contradict various models?

A major goal of the organizing committee is to produce a high quality proceedings volume as a result of this conference. This volume will be arranged topically so that major papers and shorter contributions on the same topic, including comments and discussion written for the proceedings will be together. Further details will be included in later circulars. We plan to circulate informal collections of abstracts and/or position statements prior to the conference. **The deadline for submission of abstracts or position statements will be September 20, 1982.**

If you are interested in participating in this conference, **fill out the enclosed conference questionaire and return it immediately! Only those who have returned the questionaire to the LPI by May 20, 1982, will receive the second announcement and abstract forms.**

A very limited number of travel grants for partial support will be available. If the receipt of such a grant is essential for your participation in the conference, please so indicate on the questionnaire. An estimated conference fee of $50.00 will be charged to all participants except students and those receiving travel grants.

**The Organizing Committee**

Don Clayton,
Rice University

Jim Gooding,
NASA-JSC

Mike Duke
NASA-JSC

Dieter Heymann,
Rice University

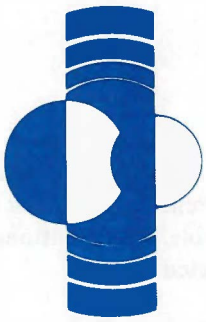
Everett Gibson,
NASA-JSC

Pam Jones
LPI (Conference Adminstrator)

Elbert King,
University of Houston (Chairman)

LUNAR AND PLANETARY INSTITUTE
3303 NASA ROAD 1 HOUSTON, TEXAS 77058 CABLE ADDRESS: LUNSI

CONFERENCE OFFICE
(713) 486-2150



**LPI Topical Conference on**

# CHONDRULES AND THEIR ORIGINS

**November 15-18, 1982**

## SECOND ANNOUNCEMENT

The Lunar and Planetary Institute is organizing a Topical Conference on chondrules with special emphasis on chondrule parent materials, processes of chondrule formation and post-formational history. The meeting will be held November 15-18, 1982, at the Lunar and Planetary Institute, Houston, Texas. This second announcement is being circulated to those who responded positively to the first announcement and to other potential participants. A third announcement containing logistic details and pre-registration form will be mailed in September.

Chondrules are primitive components of many stony meteorites. The materials from which chondrules formed, the location of formation and the processes that were responsible for chondrule genesis are of prime concern in this meeting. However, some of this early history must be read through an overprint of subsequent history, which also will be treated. So far as we are aware, this is the first meeting devoted entirely to this important subject. The enthusiastic responses to the first announcement suggest that we will have an active and knowledgeable group of participants.

In order to focus the discussions, a number of invited topical presentations will be delivered, these include:

*Stellar Chemical Processes* - Dieter Heymann

*Presolar Materials* - Don Clayton

*Processes in the Solar Nebula* - Al Cameron

*Objects We Call Chondrules* - Bob Dodd

*Isotopic Measurements and Chronology* - Chuck Hohenberg

*Which Objects in Allende Went Through a Molten Stage* -Larry Grossman

*Condensation of Chondrules* - Milton Blander

*Impact Origin of Chondrules* - Gero Kurat

*Conditions and Time of Chondrule Accretion* - Robert Hutchison

*Metamorphism in Chondrules and Chondrites* - Kurt Fredriksson

*Chondrules in Carbonaceous Chondrites* - Hap McSween

Additional topical sessions or subsessions will include experimental production of chondrules, chondrule rims and relict grains. The Organizing Committee encourages additional contributions to be as problem oriented as possible. Contributions that do not address some major topic of the meeting (see First Announcement) will not be accepted.

This conference will provide a highly informal, congenial atmosphere in which discussion and exchange will thrive. Every effort will be made to make time for adequate comment and debate on all topics. We hope that this open atmosphere of exchange will help to clarify the major issues that confront us as a community of scientists who are interested in chondrules and chondrites.

Those interested in participating in the meeting should send their one-page **abstract** or **position statement** to Chondrules, Lunar and Planetary Institute, 3303 NASA Road 1, Houston, Texas 77058 as per the enclosed instructions to be at LPI prior to **September 20, 1982**. This deadline is essential in order for us to mail copies of abstracts to first authors and attendees in time to be received before the conference. Full papers for the Proceedings volume will be due at LPI in mid-January, 1983.

Space will be provided for poster presentations for those who wish this mode of presentation.

All inquiries concerning the meeting and matters relating to it should be addressed to **Pam** Jones, Conference Administrator, LPI (713 - 486-2150).

**Organizing Committee**

Don Clayton
Rice University

Jim Gooding
NASA-JSC

Mike Duke
NASA-JSC

Dieter Heymann
Rice University

Everett Gibson
NASA-JSC

Pam Jones
LPI (Conference Administrator)

Elbert King
University of Houston (Chairman)