A.2.2 COSMOCHEMISTRY

1. Scope of Program

The Cosmochemistry Program (CCP) supports scientific investigations that may involve laboratory studies of a variety of extraterrestrial materials (meteorites, cosmic dust, and lunar samples), that are cosmochemical in nature, or that are aimed at understanding the geochemical nature of the solar system bodies (planets, satellites including the Earth's Moon, and satellites of the outer planets, and small solar system bodies); or cosmochemical studies concerned with the formation and chemical development of the solar system. The goals of this program are to support cosmochemical research projects that increase the understanding of the origin of the solar system, and the processes by which its planets and small bodies have evolved to their present state; and/or yield direct information about the formation of the solar system, the exact time scales for planetary formation and history, the nature and development of planetary surfaces, and the past activity of the Sun and cosmic rays. NASA is particularly interested in proposals for sample research projects that closely support its activities for exploring the solar system; determining its nature, origin, and history; and/or that contribute to the development of techniques for such further exploration. Individual investigations may involve direct measurements of physical and chemical properties, or research efforts that contribute new data, that analyze and synthesize existing data, or that combine both kinds of activities.

Examples of the kinds of research supported by this program include:

- cosmochemical studies of solar system formation;
- studies of chemical differentiation of planetary bodies;
- laboratory studies of phase stability, thermal emission, chemical partitioning, and other processes necessary to interpret planetary data;
- synthesis of previously obtained geochemical data;
- direct measurements of mineral compositions, major and trace element chemistry, isotopic compositions, radiometric ages, magnetism, radiation exposure effects;
- petrologic studies of materials from Solar System bodies;
- lunar geochemical and petrologic studies, lunar craters and microcraters, lunar physical and mechanical properties; and
- proposals that are designed to obtain basic scientific information that might enable the utilization of extraterrestrial resources.

However, the CCP will not consider proposals that are designed to demonstrate a technology that could be important to the utilization of extraterrestrial resources. Though no priorities are imposed on the general kinds of investigations, an ideal program is envisaged as a balance among these objectives, consistent with the quality of submitted proposals and their relevance to the current CCP.

This program is also interested in supporting certain types of research on terrestrial samples or with terrestrial analogs when such efforts contribute to overall program goals

in cosmochemistry. Specific objectives of such terrestrial research should address key geochemical processes in early terrestrial evolution; terrestrial history in terms of general solar system processes; or the reasons for differences in evolution among the various planetary bodies, including Earth, the Moon, and parent bodies of meteorites. Proposals to analyze terrestrial samples or their analogs should clearly develop the nature of the planetary connection. The specific connection to the wider range of planetary processes is a key factor in determining the success of such proposals.

Proposals for topical conferences, workshops, consortia, symposia, or other new initiatives related to Cosmochemistry program and that are generated through the initiative of the proposer may also be proposed through this NRA. For more information about the type of research supported by this program, abstracts for currently funded investigations are available online at http://spacescience.nasa.gov/, link through "Research Solicitations" to "Past/Archive Solicitations & Selections."

An important goal of the Solar System Exploration efforts is to facilitate access to data and extraterrestrial sample material for certain scientific and educational purposes, in addition to NASA-supported research projects. The NASA Johnson Space Center, Houston, Texas, is responsible for the security of and access to the lunar sample collection, as well as the interplanetary dust particles collected by high altitude aircraft and meteorites collected in the Antarctic by field parties supported by the National Science Foundation (NSF). For information on how to obtain any of the specimens in these collection, contact:

Office of the Curator
Code SN21
Johnson Space Center
National Aeronautics and Space Administration
Houston, TX 77058-3696.

Finally, note that to enable the NASA Office of Space Science to properly evaluate the relevance of proposals submitted to its programs, as well as to track its progress towards achieving its goals as mandated by the Government Performance Review Act (GPRA), all research supported by NASA's programs must now demonstrate its relationship to NASA Goals and Research Focus Area's (RFA's) as stated in the latest version of its Strategic Plan (follow links from the Web site http://spacescience.nasa.gov/); see also the discussion in Section 1 of the *Summary of Solicitation* of this NRA. Therefore, all proposers to this program element are asked to state their perception of this relevance in terms of the Goals, Science Objectives, and RFA's given in Table 3 found in the *Summary of Solicitation*. In particular, this program element is designed to help fulfill all of the RFA's 1(a), (b), (c) and (d), 2(a), and 4 (b), (c) and (d) for Goal II of the Solar System Exploration science theme. The appropriate place for this statement of relevancy is in the introduction to the proposal's "Scientific/Technical/Management" section (see Section 2.3.5 in the *Guidebook for Proposers*). The index numbers in this table may be used to identify a specific RFA, for example, "Goal I, Sun-Earth Connection Theme, RFA 1(c)" or "Goal II, Astronomical Search for Origins, RFA 3(b)."

2. Programmatic Considerations

The National Science Foundation (NSF) may consider a wide range of proposals (from domestic organizations only) that contribute new knowledge in the area of cosmochemistry and related fields. The same proposal may be submitted to both NASA and NSF if desired; however, such proposals must clearly state they are being submitted to both agencies in the proposal section entitled *Current and Pending Support* (see Chapter 2 of the *NASA Guidebook for Proposers* as discussed in this NRA's *Summary of Solicitation*).

It is estimated that the funding level for this program for Fiscal Year 2004 will be approximately $13.5M and that this level of funding will support approximately 105 research investigations, including both new proposals and in-progress multiple year awards. Awards under this NRA are subject to the availability of funds.

As a change from past practices for this program, and in anticipation of a new master data base for OSS research awards that is being implemented on an evolving basis, *Annual Progress Reports* (called "Progress" or "Status" Reports in previous research solicitations) for ongoing multiple-year awards are no longer required at the time that new proposals are due. Instead, a single *Annual Progress Report* will be due no later than 60 days in advance of the anniversary date of the award and is to be submitted as an attachment to an E-mail message to the Program Scientist for this program. Note that as an additional change from past practice, a revised budget for any remaining years of an approved award is neither necessary nor expected; the multiple year budget approved at the time of the original award is considered binding barring the development of unforeseen, extreme issues (see Section D.4 of Appendix D of the *Guidebook for Proposers* for further details).

IMPORTANT INFORMATION

- As discussed in the *Summary of Solicitation* of this NRA, the Office of Space Science (OSS) now uses a unified set of instructions for the preparation and submission of proposals given in the document entitled *NASA Guidebook for Proposers Responding to NASA Research Announcement - 2003* (or *NASA Guidebook for Proposers* for short) that may be accessed by opening http://research.hq.nasa.gov/ and linking through "Helpful References," or by direct access at http://www.hq.nasa.gov/office/procurement/nraguidebook/ (note that the updated 2003-edition of the *Guidebook* is used for this solicitation).
- Section 6 of this NRA's *Summary of Solicitation* contains the Web address relevant to the electronic submission of a Notice of Intent (NOI) to propose and a proposal's *Cover Page/Proposal Summary/Budget Summary*, as well as the mailing address for the submission of the hard copies of a proposal.

Questions about this program element may be addressed to the cognizant Discipline Scientist:

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