

A.2.4 ORIGINS OF SOLAR SYSTEMS

1. Scope of Program

This program element solicits basic research proposals 1) to conduct scientific investigations related to understanding the formation and early evolution of planetary systems, and 2) to provide the fundamental research and analysis necessary to detect and characterize other planetary systems. These investigations may involve analytical and numerical modeling, laboratory research, and observational studies in the following areas: star formation and the relationship to planetary system formation, solar nebula processes, accumulation and dynamical evolution, analysis of primitive materials, and the detection of other planetary systems. The investigations supported through this NRA should directly support the goals related to understanding planetary system formation.

Key questions addressed by the research activities supported by this program may include:

- What were the initial mass, structure, motions, and temperature of the solar nebula and the time scales over which planets formed?
- What are the conditions of star formation that lead to a single star surrounded by a protoplanetary disk?
- How was angular momentum transported in the nebula?
- What determined the masses of the giant planets?
- By what mechanism did the most primitive bodies in the solar system accumulate?
- What factors influence the growth of planetary embryos into planets?
- What processes were responsible for the patterns of chemical fractionation observed in the primitive meteorites and the volatile abundances in the planets?
- What is the frequency of the occurrence of planetary systems?

The Origins program realizes the existing potential for complementary interdisciplinary efforts to solve key scientific questions. To achieve this goal, proposals are encouraged that involve joint research efforts by investigators from different scientific communities. Interdisciplinary investigations may include, for example, studies of nebular chemistry and dynamics to understand the composition of primitive volatile-rich solar system bodies, or collaborations between observational astronomers and modelers to study the initial collapse of a protostellar cloud to form a nebula. Proposals that involve joint efforts may be submitted as separate proposals from participating institutions for each of their respective parts of the investigation or as an a single all-inclusive proposal. With respect to all-inclusive proposals, proposers should keep in mind that it is the OSS policy that all subcontracts for work at an institution other than the lead institution must be handled by the lead institution.

Proposals for topical conferences, workshops, symposia, or other new initiatives related to the Origins program are also solicited through this NRA, preferably as an additional element in a standard research proposal. For more information about the type of research

supported by this program, abstracts for currently funded investigations are available at <http://spacescience.nasa.gov/codesr/welcome.html> .

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 RFA's 1(a), (b), and (d), RFA 2(a), and RFA 3(b) of Goal II of Solar System Exploration science theme, as well as RFA's 2(a) and (b), RFA's 3 (a), (b), (c), and (d) for Goal II of the Astronomical Search for Origins 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 Information

It is estimated that the funding level for this program for fiscal year 2004 will be approximately \$6.9M and that this level of funding will support approximately 105 research investigations, including both new proposals and in-progress multiple year proposals. Of this \$6.9M, approximately \$2.5M will be used to support searches for extrasolar planets. For administrative purposes the search for extrasolar planet investigations will be managed by the Astronomy and Physics Division. .

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 Officer 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 directed to the cognizant Discipline Scientist:

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