A.12 TERRESTRIAL PLANET FINDER/FOUNDATION SCIENCE

1. Scope of Program

The Terrestrial Planet Finder/Foundation Science (TPF/FS) program solicits basic research proposals to conduct scientific investigations in support of the future Terrestrial Planet Finder (TPF) mission within the Astronomical Search for Origins theme of the Office of Space Science. Investigations are solicited that provide: i) the scientific data and theoretical framework required to define the nature and scope of the TPF mission; ii) the scientific data and theoretical framework required to refine the TPF target list; and iii) the theoretical background required to plan the mission and to interpret the data obtained. Further information about the concept for the TPF mission may be found at http://planetquest.jpl.nasa.gov/TPF/tpf_index.html. Potential proposers are referred to the TPF Precursor Science Roadmap found at this URL. This document details the research priorities for the TPF Foundation Science program.

This program element has very similar goals to the program B.4, "Origins of Solar Systems," in this NRA. Three of the four subelements are identical, and will be evaluated by the same review panels.

Proposers to this program should specify which of the following four areas they are proposing to:

- Investigations to detect and characterize extra-solar planets. For example:

  Searches for planets by means of any proven technique (e.g., radial velocity measurements, transits, micro-lensing, high resolution imaging, etc.) around a variety of types of stars, including solar, low and high mass, young, and highly evolved stars.
- Observations related to the formation and evolution of extra-solar planetary systems. For example:

  Observational studies of the composition and dynamics of zodiacal and exo-zodiacal dust, including evidence for cometary material around stars.
- Theoretical investigations related to the formation and evolution of extra-solar planetary systems. For example:
  - Theoretical studies of the composition and dynamics of zodiacal and exo-zodiacal dust, including evidence for cometary material around stars
  - Theoretical studies relevant to obtaining a more accurate estimate of the fraction of solar-type stars that may harbor terrestrial planets in the habitable zone, including studies of planet formation and migration scenarios in a variety of environments, as well as investigations of dynamical stability of various orbital configurations.
- Investigations directly related to planning and determining the scope of the TPF mission. For example:

  Measurement of the properties of potential TPF target stars to assess their suitability for the interpretation of TPF results (note that while a long term program of new observations and theory may be required to determine and/or derive these properties, such activities may be feasible only via other NASA resources such as the Space Infrared Telescope Facility (SIRTF) or the Keck Interferometer; however, it is outside the scope of this TPF/FS program to solicit proposals for new observations with these other NASA facilities. The proposals for these facilities are solicited through other program announcements).

Note that proposals to this program may also include the development of facilities and/or instrumentation that directly enables the proposed execution of any of proposed activities subject to the budgetary constraints given below.

To enable the NASA Office of Space Science to properly evaluate the relevance of proposals submitted to its programs, as well as 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 Areas (RFAs) 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 I 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 RFAs given in Table 1 found in the Summary of Solicitation. In particular, this program element is designed to help fulfill RFAs 2(a) and (b), and RFAs 3(a), (b), (c), and (d) for Goal II of the Astronomical Search for Origins science theme.

2. Programmatic Information

2.1 Funding

It is expected that the funding level for this program for Fiscal Year 2005 will be approximately $1.4M for the support of six to ten research investigations for periods of performance of up to three years. Pending the submission of proposals of adequate merit, it is expected that the selected tasks may range from $50K per year for very specific, small programs, to as much as $750K per year for larger activities, such as large-scale sky surveys that involve the development of new instrumentation, and/or in-depth theoretical investigations.

2.2 Connection to the Program Element B.4, entitled *Origins of Solar Systems*

Certain elements of this TPF/FS program directly parallel and complement the Origins of Solar Systems program solicited as Program Element B.4 in this NRA. Therefore, applicants to this TPF/FS program must specifically identify and state the relevance of their proposed activities to the TPF mission, whereas proposals of a more general nature that are not specifically aimed at the TPF mission objectives should be submitted to the Origins of Solar Systems program element of the NRA.

2.3 Proposal Preparation and Submission

IMPORTANT INFORMATION

> The *Summary of Solicitation* of this NRA points out that NASA Headquarters now uses a single, unified set of instructions, entitled *NASA Guidebook for Proposers Responding to NASA Research Announcements*, that provides detailed guidance for the preparation and submission of proposals to most of its NRAs. By reference, the current edition, *Guidebook for Proposers 2004*, is incorporated into this Office of Space Science solicitation and is accessible by linking through the menu item Helpful References at the Web site http://research.hq.nasa.gov/research.cfm or it may be directly accessed at http://www.hq.nasa.gov/office/procurement/nraguidebook/.

Proposers to this program are urged to familiarize themselves with this document, in particular its Chapters 1, 2, and 3, before preparing a proposal. This NRA's *Summary of Solicitation* also contains important instructions for the electronic submission of both a *Notice of Intent* (NOI) to propose, as well as a proposal's *Cover Page/Proposal Summary* that also includes a required *Budget Summary* for the proposal, and the mailing address for the submission of the hard copies of proposals.

2.4 Point of Contact

Questions about this program element may be directed to the cognizant Program Officer:

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