Notice for Commerce Business Daily (CBD)
and
OSS Electronic Notification Service

RESEARCH OPPORTUNITIES IN SPACE SCIENCE - 1998

This NASA Research Announcement (NRA) is a broad agency announcement as specified in FAR 6.102 (d) (2). NRA 98-OSS-03, entitled Research Opportunities in Space Science - 1998, will be available on or about February 5, 1998, by opening "Research Opportunities" from the menu on the NASA Office of Space Science (OSS) homepage at URL <http://www.hq.nasa.gov/office/oss/> on the World Wide Web. This NRA solicits proposals for supporting research, analysis, and technology across a broad range of program elements relevant to the four defined OSS science themes, entitled Astronomical Search for Origins, Solar System Exploration, Structure and Evolution of the Universe, and The Sun-Earth Connection. Proposals are solicited for the order of 25 different science program elements that span the entire range of topics in contemporary space science, with proposal due dates staggered throughout 1998. The earliest due date is May 4, 1998, while the latest is August 31, 1998. A Notice of Intent to propose is requested for all program elements. Participation through this NRA is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, NASA Centers, and other Government agencies. Further information about specific program elements may be obtained from the individual OSS Discipline Scientists listed in this NRA, while questions concerning general NRA policy issues may be directed to Dr. J. David Bohlin, Research Program Management Division, Code SR, Office of Space Science, NASA Headquarters, Washington, DC 20546-0001; E-mail: <david.bohlin@hq.nasa.gov>; phone: 202/358-0880.

OMB Approval No. 2700-0087

RESEARCH OPPORTUNITIES IN SPACE SCIENCE - 1998
(ROSS-98)

NASA Research Announcement
Soliciting Research Proposals
Starting May 4, 1998,
and Ending August 31, 1998

NRA 98-OSS-03
Issued: February 5, 1998

Office of Space Science
National Aeronautics and Space Administration
Washington, DC 20546-0001

RESEARCH OPPORTUNITIES IN SPACE SCIENCE - 1998
(ROSS-98)

The mission of the Space Science Enterprise of the National Aeronautics and Space Administration (NASA) is to solve the mysteries of the universe, to explore the solar system, to discover planets around other stars, and to search for life beyond Earth. To carry out this mission, NASA's Office of Space Science (OSS) sponsors a broad range of research programs relevant to four science themes that are currently defined as:

- *Astronomical Search for Origins* (ASO) that addresses the origins of galaxies, stars, proto-planetary and extra-solar planetary systems, Earth-like planets, and the origin of life;
- *Solar System Exploration* (to be abreviated as ESS), which seeks to understand all aspects of our Solar System, including the planets, satellites, small bodies, and solar system materials, as well as searching for possible habitats of life beyond Earth;
- *Structure and Evolution of the Universe* (SEU), which involves the study of cosmology, the large scale structure of the universe, and the evolution of stars and galaxies, including the Milky Way and objects with extreme physical conditions; and
- *The Sun-Earth Connection* (SEC) that concerns the Sun itself as a typical star and as the controlling agent of the space environment of the Solar System, especially the Earth.

Further information about these themes may be found through links from the OSS homepage on the World Wide Web at URL <http://www.hq.nasa.gov/office/oss/>. In addition, the entirety of this NRA may be found by opening "*Research Opportunities*" from the menu at this same site.

OSS pursues these fundamental science themes using a wide variety of both space flight programs and investigations in basic science and technology. This NASA Research Announcement (NRA) solicits proposals for supporting research and technology (SR&T) investigations that seek to understand natural space phenomena and space-related technologies across the full range of program elements relevant to OSS interests. Table 1 of this summary cover letter lists all the program elements solicited by this NRA in the order of their respective due dates for the submission of proposals. As a guide for responding to this NRA, Table 1 also cross references these program elements to the OSS science themes, as noted above, as a guide to their disciplinary relationships.

Appendix A contains detailed descriptions of each program element; its table of contents appears on page 5 of this cover letter. This Appendix is organized by the four OSS science themes, and then within each of these themes further subdivision by the program elements (in arbitrary order) of primary relevance to that theme (although in some cases a program element is of major importance to more than one science theme; see Table 1). Section 5 of Appendix A separately identifies program elements applicable to all themes.

Appendix B provides the standard NASA guidance for responding to NRA's, while Appendix C provides amendatory guidance to Appendix B for the format and submission requirements for proposals to be submitted to this NRA. Appendix C is a synthesis of the somewhat diverse practices followed by the individual OSS NRA's issued in previous years for most of the program

elements in Table 1, and now also incorporates a number of newly developed formats and/or procedures that are anticipated to be relatively standard for future OSS NRA's. Therefore, interested proposers should carefully read both Appendix C in its entirety as well as the science program elements of interest before writing their proposals; special attention is directed to the fact that electronic submission of a combined *Cover Page/Proposal Summary* is now required. Questions about the programs in Appendix A or about this NRA in general may be directed to the points of contact identified below in this cover letter.

OSS policy now strongly encourages participation by the space science community in education and public outreach activities with the goal of contributing to the broad public understanding of science. Therefore, proposers to this NRA are encouraged to propose Education/Public Outreach (E/PO) activities as an addition to any proposal submitted in response to this NRA; see Appendix A.5.1 for details.

Recommendations for funding will be based on the evaluation of each proposal's science and technical merits, its relevance to the OSS objectives as described in this NRA, and its requested budget. Additional specific criteria may be given in the individual program elements described in Appendix A. A proposed E/PO activity of merit will be used to discriminate between proposals of comparable scientific and programmatic merits. In all cases, the Government's obligation to make awards is contingent upon the availability of appropriated funds from which payment can be made and the receipt of proposals that NASA determines are acceptable for award under this NRA.

Participation in this program is open to all categories of U.S. and non-U.S. organizations, including educational institutions, industry, nonprofit institutions, NASA Centers, and other Government agencies. Historically Black Colleges and Universities (HBCU's), other minority educational institutions, and small businesses and organizations owned and controlled by socially and economically disadvantaged individuals or women are particularly encouraged to apply.

SPECIAL NOTE: (1) Because this NRA is released far in advance of the deadlines for many of the program elements in Table 1, additional programmatic information about any given element may develop before proposals are due. If so, such material will be added as an Amendment to this NRA as posted at its Web site no later than 90 days before the proposal deadline for that program element. It is the responsibility of the prospective proposer to check this site for updates concerning the program element(s) of interest.

The following summary information applies to this ROSS-98 NRA:

- Program alpha-numeric identifier: NRA 98-OSS-03
- Date of NRA issue: February 5, 1998
- Notices of Intent (NOI) to propose -
  - Due dates: See program elements of interest in Table 1.
  - Addresses for submission: See program elements of interest in Appendix A.
- Submission of Proposals -
  - Required number: 15 copies (unless otherwise specified in Appendix A), plus signed original.
  - Due date: See Table 1 (~60 days after NOI due).
  - Addresses for submission: See program elements of interest in Appendix A.
- Selecting Official: Director
  Research Program Management Division
  Office of Space Science
- Announcement of selections: ~120 days after proposal due date.
- Initiation of funding for new awards: ~ 60 days after proposal selection.
- Further information -
  - Science program elements: Program element Discipline Scientists identified in Appendix A.
  - General NRA policy/procedures: Dr. J. David Bohlin
    Research Program Management Division
    Code SR
    Office of Space Science
    National Aeronautics and Space Administration
    Washington, DC 20546-0001
    Phone: (202) 358-0880
    E-mail: david.bohlin@hq.nasa.gov

One final point of important information: Beginning in March 1998, NASA OSS will switch from using postcards sent by surface mail to an electronic notification system for all of its research program announcements. Subscription to this new service may be accomplished after February 1, 1998, by accessing the OSS home page on the World Wide Web at URL <http://www.hq.nasa.gov/office/oss/>, selecting the menu item *Subscribe to E-mail Announcements* and then following the instructions within the subsection entitled *Space Science Research Announcement Listserve*. Owing to the increasingly multidisciplinary nature of OSS programs, subscription to this electronic service will notify subscribers of all future NASA OSS program announcements that are released, regardless of the OSS science theme or type of announcement (anticipated to be 20 to 30 items per year). Regardless of whether you subscribe to this service or not, all current OSS research announcements may always be accessed and downloaded by linking through "*Research Opportunities*" on this OSS homepage menu.

Your interest and cooperation in responding to this ROSS-98 NRA are appreciated. In addition, comments about the nature and/or structure of this inclusive NRA for the OSS supporting research and analysis programs are solicited and welcome. Such comments may be directed to either the Discipline Scientists identified for each program element in Appendix A or to Dr. Bohlin as identified above.

Alan N. Bunner
Science Program Director
Structure and Evolution of the Universe

Carl B. Pilcher
Acting Science Program Director
Solar System Exploration

Edward J. Weiler
Science Program Director
Astronomical Search for Origins

George L. Withbroe
Science Program Director
The Sun-Earth Connection

APPENDICES to NRA 98-OSS-03

A. SCIENCE PROGRAM ELEMENTS SOLICITED BY THE ROSS-98 NRA

A.1 Astronomical Search for Origins
- A.1.1 Origins of Solar Systems
- A.1.2 Research in Exobiology

A.2 Structure and Evolution of the Universe
- A.2.1 High Energy Astrophysics
- A.2.2 Long-Term Space Astrophysics *****
- A.2.3 Ultraviolet, Visible, and Gravitational Astrophysics *****
- A.2.4 Astrophysics Data *****
- A.2.5 Cosmic Ray Physics
- A.2.6 Astrophysics Theory *****
- A.2.7 Infrared/Submillimeter/Radio/Interferometry Astronomy *****

A.3 Solar System Exploration
- A.3.1 Cosmochemistry *****
- A.3.2 Planetary Astronomy *****
- A.3.3 Planetary Atmospheres
- A.3.4 Planetary Geology and Geophysics
- A.3.5 Planetary Instrument Definition and Development
- A.3.6 Planetary Major Equipment

A.4 The Sun-Earth Connection
- A.4.0 Overview: The Sun-Earth Connection Science Theme
- A.4.1 Sun-Earth Connection Theory *(previously "Space Physics Theory")*
- A.4.2 Heliospheric Physics
- A.4.3 Ionospheric, Thermospheric, and Mesospheric (ITM) Physics
- A.4.4 Magnetosphere Physics
- A.4.5 Solar Physics Research, Analysis, and Suborbital
- A.4.6 Suborbital Program in Magnetospheric and ITM Physics
- A.4.7 Advanced Composition Explorer (ACE) Guest Investigator
- A.4.8 Sun-Earth Connection Guest Investigator

A.5 Interdisciplinary Program Elements
- A.5.1 Education/Public Outreach
- A.5.2 Applied Information Systems Research
- A.5.3 Mission Concepts for Ultra Long Duration Ballooning

*** Also provides significant support to Astronomical Search for Origins.**

B. GENERAL INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS

C. SPECIFIC GUIDANCE FOR RESPONDING TO THE ROSS-98 NRA