

## C.2 SOLAR AND HELIOSPHERIC PHYSICS

### 1. Scope of Program

#### 1.1 Introduction

Proposers to this program element are encouraged to read Appendix C.1 for an overview of the Sun-Earth Connection (SEC) science theme of the NASA Office of Space Science.

The Solar and Heliospheric Physics program has as its objective the comprehensive study of all five solar and heliospheric research areas, namely the:

- ? Solar interior,
- ? Solar disk,
- ? Solar atmosphere,
- ? Inner heliosphere, and
- ? Outer heliosphere,

through two main research thrusts, one characterized by nonflight Supporting Research and Technology (SR&T) that may be carried out in the office, observatory, or laboratory setting (see subsection 1.2 below), and one carried out by experiment hardware carried as the primary payload on balloons, sounding rockets, or as secondary, rocket-class payloads carried on the NASA Space Shuttle or other flights of opportunity that is generically referred to as Low Cost Access to Space (LCAS; see subsection 1.3 below).

Note that 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://space.science.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 1(a) and (b) and 2(a) and (b) of Goal II for the Sun-Earth Connection 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)."

Efforts focused on those particular aspects of the Sun-Earth system that directly affect life and society are not appropriate for the Solar and Heliospheric Physics program, but may be

submitted to the Living with a Star Targeted Research and Technology program described in Appendix C.7.

## 1.2 Solar and Heliospheric Physics Supporting Research and Technology (SR&T)

For purposes of program balance, the NASA Solar and Heliospheric Physics program element is organized into a matrix of five techniques, viz.,

- Development of Instrument Concepts (but not major space flight instruments *per se*);
- Ground- and Space-based Observations;
- Theory or Modeling;
- Data Analysis; and
- Ancillary Laboratory Research (e.g., derivation of atomic constants, photometric calibrations, or simulation of solar and heliospheric phenomena),

for each of the five solar and heliospheric research areas noted above in Subsection 1.1 above. Science research investigations in all matrix categories are invited. Especially welcomed are proposals that seek to explore and demonstrate concepts for new instruments for future suborbital or orbital flight opportunities such as those identified in the Sun-Earth Connection Roadmap found at [http://sec.gsfc.nasa.gov/sec\\_roadmap.htm](http://sec.gsfc.nasa.gov/sec_roadmap.htm), e.g., the Reconnection and Microscale (RAM) Probe. Although no priorities are imposed on these categories, an ideal program is envisaged as a balance among them, consistent with the quality of submitted proposals and their relevance to the current Solar and Heliospheric Physics flight programs.

This SR&T program supports investigations involving analyses of existing data or the development of computer programs that are or will be demonstrably available in the public domain. Acceptable SR&T investigations include the development of theoretical models and numerical simulation techniques pertinent to solar and heliospheric physics, and, in special cases, the development or coordination of solar and heliospheric ground-based observing capabilities that support NASA Solar and Heliospheric Physics flight programs.

As part of a mission-oriented agency, the Sun-Earth Connection theme seeks to fund those efforts that directly impact NASA missions or interpretation of their data. Therefore, investigations that are judged to be more appropriate for submission to other Federal agencies, even if of considerable merit, will not be given high priority for funding through this NRA.

The Solar and Heliospheric Physics SR&T program also supports investigations involving analyses of existing NASA space mission data but only if such data reside in research quality databases in the public domain. For non-NASA missions, such as the Solar Mass Ejections Imager (SMEI) investigation on the Department of Defense's Coriolis spacecraft, or NOAA's Solar X-Ray Imager (SXI), etc., preference will be given to those proposals intending to utilize open databases. For investigations using restricted data, the proposer must submit a letter from

the experiment Principal Investigator confirming that that data will be made available for the proposed SR&T work in a timely manner, which NASA reserves the right to confirm.

### 1.3 Low Cost Access to Space Program in Solar and Heliospheric Physics

The Solar and Heliospheric Physics Low Cost Access to Space (LCAS) program is expected to continue to lead the way in the development of instrument concepts for future solar and heliospheric missions using a variety of methods for providing low cost access to space. These methods include standard and long-duration balloons, sounding rockets, Shuttle-based carriers, and sounding rocket-class payloads flown as secondary payloads or on other flights of opportunity. It is emphasized that a proposal for the Solar and Heliospheric Physics LCAS program must be for a complete science investigation, including data analysis and publication of results, even if these activities are projected to be done beyond the nominal three-year period of performance for most awards in this program. In a case like this, a follow-on proposal must be submitted for full peer review that documents the progress made in developing, if not flying, the payload, and that projects the steps necessary for data acquisition and reduction, and the publication of results.

Questions concerning sounding rocket vehicles and operations may be addressed to:

Mr. Philip Eberspeaker  
Sounding Rocket Program Office  
Code 810  
Wallops Flight Facility  
National Aeronautics and Space Administration  
Wallops Island, VA 23337  
Telephone: (757) 824-2202  
E-mail: Philip.J.Eberspeaker@nasa.gov

Questions concerning balloon operations may be addressed to:

Mr. Craig Purdy  
Balloon Office  
Wallops Flight Facility  
National Aeronautics and Space Administration  
Wallops Island, VA 23337  
Telephone: (757) 824-1453

E-mail: Craig.L.Purdy@nasa.gov

## 2. Programmatic Information

Currently, the Solar and Heliospheric Physics SR&T program has a distribution of one-, two-, and three-year grants that leaves a portion of the program available for competition each year. Total SR&T program funds in Fiscal Year (FY) 2005 of \$8.2M will support approximately 90 grants, of which about 30 will have expired by FY 2006, freeing a corresponding portion of the funds for proposals competing under this ROSS-2004 NRA.

The Solar and Heliospheric Physics LCAS Program has approximately \$1.4M available for selections made through this NRA of three to four suborbital investigations of up to three years duration each beginning in early FY 2006.

### 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 is 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> or it may be directly accessed at <http://www.hq.nasa.gov/office/procurement/nraguidebook/>. Proposers to this Program Element 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 the schedule and instructions for the electronic submission of both a *Notice of Intent* (NOI) to propose, as well as a proposal’s *Cover Page/Proposal Summary/Budget Summary* for the proposal, and the mailing address for the submission of proposals.

To aid in the identification of peer reviewers, it is essential that the electronically submitted proposal Cover Page for Solar and Heliospheric Physics proposals include a single choice of descriptor (e.g., Theory or Modeling/Solar Atmosphere; Ground-based Observations/Solar Interior; Data Analysis/Inner heliosphere; etc.) as the

"Technique/Research Area" designation that will appear on the Web site format (see NASA *Guidebook for Proposers* for directions).

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

Dr. William J. Wagner  
Sun-Earth Connection Division  
Code SS  
Office of Space Science  
NASA Headquarters  
Washington DC 20546-0001

Telephone: (202) 358-0911  
Facsimile: (202) 358-3987  
E-mail: [William.J.Wagner@nasa.gov](mailto:William.J.Wagner@nasa.gov)

---