A.1.4 ASTROPHYSICS THEORY

1. Scope of Program

The Astrophysics Theory program is intended to support efforts to develop basic theory needed for NASA's space astrophysics programs. The periods of performance of investigations that may be submitted for this research element range from one to three years, although most proposals that are selected have a duration of three years. Abstracts of currently funded ATP projects can be found online at http://spacescience.nasa.gov/research.htm .

Proposals submitted for this program must:

- be directly relevant to space astrophysics by facilitating the interpretation of existing data from space astrophysics missions, foreign as well as domestic, or should lead to predictions that can be tested with space astrophysics observations;
- address theoretical problems in space astrophysics that are either broadly applicable across astrophysics or narrowly focused on a particular subdiscipline of space astrophysics. Examples include infrared and radio astrophysics, ultraviolet and visible astrophysics, high energy astrophysics, gravitational wave astrophysics, space tests of the fundamental laws of physics (including relativity, cosmology, and galactic cosmic ray/particle astrophysics);

and

- consist predominantly of theoretical studies and the development of theoretical models that may also incidentally include data analysis and comparison tests of theory against data from space astrophysics missions.

Conversely, proposals to the Astrophysics Theory program may not:

- consist primarily of data reduction or data analysis (such proposals should be directed to the mission-specific programs, the Astrophysics Data or the Long Term Space Astrophysics programs);
- address theoretical topics that are predominantly unrelated to the needs of NASA's space astrophysics programs (such proposals should be directed to other appropriate Federal agencies);
- deal strictly or predominantly with Solar System objects or solar-terrestrial interaction studies, including solar energetic particles;
- request support for organizing and/or hosting scientific meetings; or
- request support for substantial computing facilities or resources.

2. Proposal Category and Research Areas

Two types of proposals will be considered: Proposals from research groups headed by a single Principal Investigator and proposals from individual researchers. A proposal from a research group must clearly justify the scientific need for and logic of the team effort;

that is, a set of unrelated or only loosely related research topics by several investigators does not constitute a valid group effort for the purposes of this program. If a new proposal for this program element is itself based on a previously funded research effort, the proposal must identify that work and clearly summarize all significant results from it.

For the purposes of conducting the review, every proposal for this program must be labeled with one (or more, if appropriate) suggested Topic Categories from the current list below in both its Notice of Intent and in the proposal submission itself (the primary use of these Topic categories is to facilitate the assignment of the proposal to an appropriate review panel; NASA reserves the right to assign a proposal to a different category):

1. *Star Formation and Pre-Main Sequence Stars* (star forming clouds, protoplanetary and debris disks, protostars, T Tauri stars, brown dwarfs, dust and astrochemistry)
2. *Main Sequence* Stars;
3. *Post-Main Sequence Stars and Collapsed Objects* (giants, isolated white dwarfs, isolated neutron stars, central stars of planetary nebulae, and gamma-ray bursts);
4. *Binary Systems* (cataclysmic variables, x-ray binaries, and black hole binaries);
5. *Interstellar Medium and Galactic Structure* (supernova remnants, dark clouds, interstellar dust, H II regions, diffuse galactic emission, and planetary nebulae);
6. Normal *Galaxies* (normal galaxies, interacting galaxies, starburst galaxies);
7. Active Galaxies and Quasars (Seyfert and radio galaxies, AGN's, and quasars)
8. *Large Scale Cosmic Structures* (clusters of galaxies, galaxy environment and evolution, intracluster medium, diffuse x-ray background, and cosmology)
9. *Cosmic Ray/Particle Astrophysics*
10. *Gravitational Astrophysics and Fundamental Physics* (gravitational wave astronomy and space tests of the fundamental laws of physics, including relativity).

3. Programmatic Considerations

It is anticipated that approximately $2.5M will be available through this solicitation to fund proposals, of nominally three years duration each, for the funding of new awards for this program element. The typical level of support per year is expected to be in the range of $50K to $100K for individuals and up to a maximum of $300K for research groups. The file called "ATP Statistics" located with the abstracts of previously awarded ATP grants (see URL address above) also contains funding statistics for the last review cycle.

IMPORTANT INFORMATION

As discussed in the *Summary of Solicitation* of this NRA, the Office of Space Science (OSS) is now using a single, unified set of instructions for the submission of proposals. This material is contained in the document entitled *NASA Guidebook for Proposers Responding to NASA Research Announcement – 2001* (or *NASA Guidebook for Proposers* for short) that is accessible by opening URL http://research.hq.nasa.gov, and linking through the menu item "Helpful References," or may be directly accessed online at URL http://www.hq.nasa.gov/office/procurement/nraguidebook/. This NRA's Summary of Solicitation also contains the schedule and instructions for the electronic submission of a *Notice of Intent* (NOI) to propose and a proposal's *Cover Page/Proposal Summary*, which now also includes the required *Budget Summary*, and the mailing address for the submission of a proposal.

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