

## APPENDIX D. ASTROPHYSICS RESEARCH PROGRAM

### D.1 ASTROPHYSICS RESEARCH PROGRAM OVERVIEW

#### 1. Introduction

The objectives of research solicited in program elements described in Appendices D.2 through D.9 of this NRA are focused on achieving the goals of the Science Mission Directorate's Astrophysics Research Program as defined in the *2010 NASA Science Plan* (available at <http://nasascience.nasa.gov/about-us/science-strategy>). Proposers to the elements described in Appendix D are encouraged to read this *NASA Science Plan* to gauge the relevance of their research to NASA.

The *NASA Guidebook for Proposers* (Section 2) and the *ROSES 2012 NRA* (Section IV) provide clear and specific requirements for the format of proposals submitted in response to this solicitation: page limits, acceptable font sizes, line spacing, margins, etc. Some of the program elements listed below also include formatting requirements. These requirements have been developed to ensure a level playing field for all proposers. The Astrophysics Division takes these requirements seriously, and proposals found to violate them will be penalized, even to the extent of not being considered for funding. It is the responsibility of the proposer to ensure that a submission complies with all formatting requirements.

Proposers are reminded that it is the pdf version of their proposal in NSPIRES that will be judged for compliance. In rare cases, cross-platform translation of pdf documents can alter the formatting of a document. Proposers are strongly urged to download copies of all documents after upload to NSPIRES, to ensure that they still conform to all formatting requirements.

The program elements are described below. Abstracts of previously selected investigations may be found online at <http://nspires.nasaprs.com/>.

#### 2. Astrophysics Data Analysis

The Astrophysics Data Analysis Program (ADAP; Appendix D.2) supports research whose primary emphasis is the analysis of archival data from current and past NASA space astrophysics missions. The magnitude and scope of the archival data from those missions enables science that transcends traditional wavelength regimes and allows researchers to answer questions that would be difficult, if not impossible, to address through an individual observing program. The program also supports the analysis of data from approved priority A or B Guest Observer (GO) programs using Suzaku, and priority B GO programs using XMM-Newton, even if those observations have yet to be executed, or the data are still within their proprietary period.

#### 3. Astrophysics Research and Analysis

The Astrophysics Research and Analysis program (APRA; Appendix D.3) supports investigations in the areas of suborbital flights, development of detectors and supporting technology, laboratory astrophysics, and limited ground based observing. Basic research

proposals in these areas are solicited for investigations that are relevant to NASA's programs in astronomy and astrophysics, including the entire range of photons, gravitational waves, and particles of astronomical origin.

#### 4. Astrophysics Theory

The Astrophysics Theory Program (ATP; Appendix D.4) supports theoretical investigations or modeling of the astrophysical phenomena targeted by past, current, or future NASA astrophysics space missions. Laboratory work related to NASA strategic goals in gravitation and fundamental physics is now supported in the Astrophysics Research and Analysis program (APRA, Appendix D.3). Theoretical work pertaining to atomic and molecular astrophysics and other topics directly related to Laboratory Astrophysics should also be proposed to APRA.

#### 5. Astrophysics Guest Investigators

Three program elements support science investigations that require and/or support new data obtained with currently operating NASA astrophysics space missions. Guest investigator programs are included for the Swift gamma-ray burst explorer (Appendix D.5), the Fermi Gamma-ray Space Telescope (Appendix D.6), and the Kepler mission (Appendix D.7). Guest investigator programs for the Hubble Space Telescope (<http://www.stsci.edu/>), the Chandra X-ray Observatory (<http://cxc.harvard.edu/>), SOFIA (<http://www.sofia.usra.edu/>) and the Spitzer Space Telescope (<http://www.spitzer.caltech.edu/>) are solicited separately by the respective science centers of those missions.

#### 6. Strategic Astrophysics Technology

The Strategic Astrophysics Technology program (Appendix D.8) supports focused development efforts for key technologies to the point at which they are ready to feed into major missions in the three science themes of the Astrophysics Division: Exoplanet Exploration, Cosmic Origins, and the Physics of the Cosmos. This program is specifically designed to address middle technology readiness level (TRL) “gaps” between levels 3 and 6: the maturation of technologies that have been established as feasible, but which are not yet sufficiently mature to incorporate into flight missions without introducing an unacceptable level of risk.

#### 7. Nancy Grace Roman Technology Fellowships in Astrophysics

The Nancy Grace Roman Technology Fellowship in Astrophysics (Appendix D.9) gives early career researchers the opportunity to develop the skills necessary to lead astrophysics flight instruments or projects, and future astrophysics missions. Fellows must be recent Ph.D. recipients; in general, graduating in a calendar year no earlier than seven years before the issuance date of this ROSES NRA. They must hold a nontenured early career position, such as a postdoctoral, tenure-track, term civil service, or equivalent position. The program aims to foster new talent by putting early-career instrument builders on a trajectory towards long-term positions at a U.S. institution; therefore, fellows are required to be U.S. citizens or to have lawful status of permanent residency.

## 8. Origins of Solar Systems

The cross-division program Origins of Solar Systems is described in Appendix E.3. Work related to the detection and characterization of planetary systems that is directly tied to the NASA strategic goal to search for Earth-like planets is of interest to the Astrophysics Division.

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