

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.10 of this NASA Research Announcement (NRA) are focused on achieving the goals of the Science Mission Directorate's Astrophysics Research Program, as defined in the *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 the Astrophysics Research Program.

The *NASA Guidebook for Proposers* (Section 2) and the *ROSES-2016 Summary of Solicitation* (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. See also Table 1 of the *ROSES-2016 Summary of Solicitation*. 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 evaluated or considered for funding. It is the responsibility of the proposer to ensure that a submission complies with all formatting requirements.

Most proposals to ROSES will require a data management plan (DMP) or an explanation of why one is not necessary given the nature of the work proposed (e.g., instrument development proposals, see Sections 3, 6, and 7, below). This requirement will be satisfied by responding to the compulsory NSPIRES cover page question about the DMP. It is expected that the majority of proposals will simply state that the proposer will meet the mandatory minimum requirement by making the data behind figures and tables available electronically at the time of publication, ideally in supplementary material with the article. More information on the data management plan is available in the [SARA DMP FAQs](#).

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. To ensure that they still conform to all formatting requirements, proposers are strongly urged to download copies of all documents after upload to NSPIRES.

The program elements are described below. Abstracts of previously selected investigations may be found online at <http://nspires.nasaprs.com/> by choosing "Solicitations" followed by "Closed/Past Selected", searching on the name or abbreviation of the program (e.g., ADAP), and downloading the selections PDF file from the home page of that Program Element.

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 some approved Guest Observer (GO) programs using Spitzer, 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 suborbital and suborbital-class investigations, 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 particle astrophysics. The emphasis of this solicitation is on technologies and investigations that advance NASA astrophysics missions and goals. Projects devoted to technology development efforts (Detector Development and Supporting Technology categories) that do not generate data need not provide a data management plan and proposers may simply cite this statement in response to the NSPIRES cover page question in lieu of presenting a plan.

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

Five 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), the K2 mission with the Kepler spacecraft (Appendix D.7), and the nuclear spectroscopic telescope NuSTAR (Appendix D.10). The JAXA-NASA ASTRO-H mission is planned to launch in early 2016, and, based upon the currently planned launch and commissioning schedule, NASA expects to issue the initial call for Guest Observer (GO) Proposals (Cycle 1) by an Amendment to ROSES-2016 in April 2016. Guest investigator programs for the Hubble Space Telescope (<http://www.stsci.edu/>), the Chandra X-ray Observatory (<http://cxc.harvard.edu/>), Stratospheric Observatory for Infrared Astronomy (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. Please note that D.7, the K2 Guest Observer program, uses a two-step proposal submission process. Please carefully read Section 7 of the K2 Program Element.

6. Strategic Astrophysics Technology

The Strategic Astrophysics Technology program (SAT; 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. NASA does not require a data management plan for proposals to SAT.

7. Nancy Grace Roman Technology Fellowships in Space Astrophysics

The Nancy Grace Roman Technology Fellowship in Space Astrophysics (RTF; Appendix D.9) gives early career researchers the opportunity to develop the skills necessary to lead astrophysics flight instruments or projects, and future space 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. NASA does not require a data management plan for proposals to RTF. Proposals for the Nancy Grace Roman Technology Fellowship (RTF) program are not solicited in ROSES-2016. It is anticipated that henceforth the program will solicit proposals on alternate years; thus RTF proposals will again be solicited in ROSES-2017.

8. Exoplanet Research Program

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

9. Habitable Worlds Program

The cross-division program on habitable planets is described in Appendix E.4. The Astrophysics Division will consider supporting investigations that are focused upon the characterization of potentially habitable exoplanets and their atmospheres in order to inform targeting and/or operational choices for current NASA Astrophysics missions and/or formulation data for future NASA Astrophysics observatories.
