

A.2.1 High Energy Astrophysics Program

1. Scope of Program

This program element solicits basic research proposals to conduct investigations that are relevant to the NASA High Energy Astrophysics (HEA) Supporting Research and Technology (SR&T) Program. The primary goal of the HEA SR&T program is to obtain a better understanding of astrophysical objects (excluding the Sun) and phenomena as revealed through their high energy radiation characteristics. This HEA program comprises the fields of x-ray and gamma-ray astronomy, which correspond operationally to photon energies in the approximate range of 0.1 keV to 50 GeV.

The purpose of the HEA SR&T program is to provide support for the HEA flight program in the disciplines of x- and gamma-ray astronomy. In the context of this program, x-rays are defined as photons in the approximate energy range 0.1-30 keV, while gamma-rays are considered to lie in the energy range 30 keV - 50 GeV. The HEA SR&T program provides support for basic research relevant to the design and development of instrumental concepts for future NASA HEA missions and the conduct of scientific investigations via exposure of instrumentation carried on sounding rockets and high-altitude balloons. Proposed research may include experimental laboratory astrophysics investigations, as well as ground-based observations of phenomena defined primarily by their high-energy characteristics, provided that such studies pertain directly to NASA HEA space missions. Note that while the scientific and technical merit of the proposed research is the primary selection criterion, relevance to NASA's HEA flight program is of nearly equal weight and must be explicitly described in the proposal. A list of relevant past, present and future HEA missions is given in Tables 1 and 2 below in this Section, which are furnished only as a guide to assessing relevance of proposals for this program element.

NOTE: Theoretical investigations that are generally relevant to this science area are solicited separately under the Astrophysical Theory Program, and projects directed mainly toward the analysis of archival data are covered under the Astrophysics Data Program. Investigations that fall into either of these categories are not within the scope of the HEA SR&T program.

Table 1 - NASA X-ray Astronomy Missions Relevant to the HEA SR&T Program

<u>MISSION</u>	<u>PRIMARY EMPHASIS</u>
High Energy Astronomy Observatory-1 (HEAO-1)	All-sky x-ray survey and spectrophotometric observations of selected cosmic x-ray sources
High Energy Astronomy Observatory-2 (HEAO-2: "Einstein")	Imaging and spectroscopic observations of selected cosmic x-ray sources
Broad Band X-ray Telescope (Astro/BBXRT)	Nondispersive spectroscopic observations of selected cosmic x-ray sources
Diffuse X-ray Spectrometer (DXS)	Spectroscopic observations of the soft x-ray diffuse background
Roentgen Satellite* (ROSAT)	All-sky x-ray/EUV survey and imaging observations of selected cosmic x-ray sources
Asuka (ASCA, formerly ASTRO-D)*	Spatially-resolved spectroscopic observations of selected cosmic x-ray sources
X-ray Timing Explorer (XTE)	Spectrophotometric observations of selected cosmic x-ray sources
Advanced X-ray Astrophysics Facility (AXAF)	High-resolution imaging/spectroscopic observations of selected cosmic x-ray sources
Spectrum-X-Gamma*	High-throughput, moderate-resolution imaging spectroscopic and polarimetric observations of selected cosmic x-ray sources
X-ray Multi-Mirror Mission* (XMM)	High-throughput, moderate-resolution imaging/spectroscopic observations of selected cosmic x-ray sources
ASTRO-E*	Spatially-resolved high-resolution spectroscopic observations of selected cosmic x-ray sources
Constellation X	High throughput, high resolution spectroscopic observations of selected cosmic x-ray sources
* International Collaboration	

Table 2 - NASA Gamma-Ray Astronomy Missions Relevant to the HEA SR&T Program

<u>MISSION</u>	<u>PRIMARY EMPHASIS</u>
High Energy Astronomy Observatory-1 (HEAO-A4)	All-sky intermediate energy survey
High Energy Astronomy Observatory-3 (HEAO-C1)	All-sky high resolution spectroscopic survey
Solar Maximum Mission Astronomy (SMM)	Solar and cosmic x-ray and gamma-ray observations
International Sun-Earth Explorer/	Gamma-ray bursts
International Cometary Explorer (ISEE/ICE)	Gamma-ray bursts
Compton Gamma-Ray Observatory (GRO)	All-sky wide-band gamma-ray survey
Global Geospace Program (GGS [Wind/TGRS/Konus])	Gamma-ray burst spectroscopy
High-Energy Transient Experiment (HETE-II)	Gamma-ray burst position determination
INTEGRAL*	High-resolution gamma-ray spectroscopy
GLAST	High-throughput, high energy gamma-ray imaging/spectroscopic observations of selected cosmic gamma-ray sources
* International Collaboration	

2. Programmatic Considerations

The HEA SR&T program has traditionally been announced and proposals selected only every three years. The last such selection was in 1996. Therefore, the budget for this program is currently fully subscribed, and proposals for participation in the HEA SR&T Program are not solicited by this ROSS-98 NRA. It is anticipated that the next opportunity to propose to this program will be in spring 1999, and that roughly \$9M will be available in FY 2000 for the funding of about 30-40 new three year projects. Detailed information pertaining to the schedule (NOI/Proposal due dates, etc.) will be provided in the ROSS-99 NRA that will be issued approximately one year from now.

Additional information may be obtained from the Discipline Scientist:

Dr. Louis J. Kaluziński
Research Program Management Division
Code SR
Office of Space Science
NASA Headquarters
Washington, DC 20546-0001
Telephone: (202) 358-0365
E-mail: louis.kaluziński@hq.nasa.gov