

Opportunity Title: Astrophysics: Gamma-Ray Astronomy

Opportunity Reference Code: 0028-NPP-NOV23-GSFC-Astrophys

Organization National Aeronautics and Space Administration (NASA)

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Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description A continuing research program in medium- and high-energy gamma-ray astronomy focuses on increasing our knowledge of the nature and origin of Galactic and extragalactic gamma rays. The work includes instrument development, data analysis, and theoretical studies. Scientific research is in the fields of Galactic diffuse radiation, pulsars, gamma-ray bursts, solar flares, molecular clouds, normal galaxies, active galactic nuclei, and extragalactic diffuse radiation. The results will help us to understand high-energy processes in the Sun, in celestial objects, in the interstellar medium, and in extragalactic space.

The efforts currently concentrate on two projects. The first is participation in the Fermi Gamma-ray Space Telescope mission, involving an international collaboration of particle physicists and astrophysicists. We are involved with many aspects of the Fermi mission, including simulations, development of data analysis techniques, and science analysis. The second is the development of new instrumentation for gamma-ray astrophysics. This work has three thrusts: 1) the Advanced Energetic Pair Telescope (AdEPT) for gamma-ray polarimetry in the 2-200 MeV range. AdEPT is a large volume gaseous time projection chamber with high spatial resolution two-dimensional readout. It is optimized to measure gamma rays interacting via pair production at the highest achievable angular accuracy, limited by the undetectable nuclear recoil, 2) AMEGO, a combination Compton scattering and pair conversion instrument utilizing silicon strips. This instrument is similar in construction to the Fermi Large Area Telescope, but optimized for the 200 keV - 10 GeV energy range, and 3) BurstCube, a CubeSat designed to detect gamma-ray transients such as short gamma-ray bursts in the 10 keV to 1 MeV energy range using Cesium Iodide scintillators coupled to Silicon Photomultipliers.

Location:

Goddard Space Flight Center
Greenbelt, Maryland

Field of Science: Astrophysics

Advisors:

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Applications with citizens from Designated Countries will not be accepted at this time, unless they are Legal Permanent Residents of the United States. A complete list of Designated Countries can be found at: <https://www.nasa.gov/oiiir/export-control>.

Eligibility is currently open to:

- U.S. Citizens;
- U.S. Lawful Permanent Residents (LPR);
- Foreign Nationals eligible for an Exchange Visitor J-1 visa status; and,
- Applicants for LPR, asylees, or refugees in the U.S. at the time of application with 1) a valid EAD card and 2) I-485 or I-589 forms in pending status

Eligibility Requirements • **Degree:** Doctoral Degree.