

**Opportunity Title:** Astrophysics: Theoretical Gamma-Ray Astrophysics

**Opportunity Reference Code:** 0081-NPP-NOV23-GSFC-Astrophys

**Organization** National Aeronautics and Space Administration (NASA)

**Reference Code** 0081-NPP-NOV23-GSFC-Astrophys

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

**Description** Theoretical gamma-ray astrophysics research conducted in the Laboratory for High-Energy Astrophysics concerns astrophysical processes that produce emission at gamma-ray energies. This research attempts to answer fundamental questions such as the origin, structure, and evolution of the Universe; the nature of compact objects; the origin of the cosmic rays; and the structure and evolution of the galaxy. Research is performed on gamma-ray line and continuum production mechanisms, on physical processes in strong magnetic fields, on the physics of electron-positron pair plasmas, and on radiation transfer in the gamma-ray regime. These physical processes are applied to models of compact sources, including active galactic nuclei, the galactic center, galactic gamma-ray sources, pulsars, and gamma-ray bursters. They are also applied to diffuse sources of gamma-rays, including the galaxy and young supernova remnants. Gamma-ray tests for the nature of dark matter are also proposed. Applicants are encouraged to participate in the above research or to initiate related projects. Gamma-ray tests of special relativity, as well as tests of proposed quantum gravity effects on high energy gamma-ray processes are also explored.

**Location:**

Goddard Space Flight Center  
Greenbelt, Maryland

**Field of Science:** Astrophysics

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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.