

**Opportunity Title:** Space Science: Laboratory Studies of Cosmic Ices, Polycyclic Aromatic Hydrocarbons and Carbonaceous Molecules

**Opportunity Reference Code:** 0007-NPP-NOV23-ARC-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** Major laboratory and theoretical research is under way to study the composition, and the physical and chemical properties of interstellar and planetary materials. Among the materials studied are interstellar polycyclic aromatic hydrocarbons (the largest molecules in space), aerosols and their gas phase molecular precursors in planetary atmospheres, ice mantles on interstellar grains and ice in comets and on solar system bodies. Cosmic and planetary material analogs (solid and gas phase) are produced in the laboratory under conditions realistically close to those expected in the interstellar and/or interplanetary medium (i.e., low [cryogenic] temperatures, high vacuum). Then, the materials are probed using current analytical techniques (e.g., spectroscopy in the ultraviolet to far-infrared range, Raman spectroscopy, time-of-flight mass spectrometry, gas chromatography). We are also studying the effects of interstellar and planetary processes (e.g., ultraviolet photolysis, high energy electron bombardment, and heating and cooling) on the structure and composition of these materials. Our goals are to provide quantitative information for interpreting observations from ground-, air-, and space-based observatories; to support the interpretation of data taken from extraterrestrial samples (cosmic dust, meteorites, and samples returned by spacecraft missions); to guide instrument development for future missions; and to help improve existing astrophysical and planetary models. This program is closely related to research described in related opportunities entitled ""Astrophysics Research Analysis"", ""Planetary Atmospheres"", ""Observational Infrared Astronomy"", ""Theoretical Astrophysics"", and ""Cosmochemistry"" and is part of NASA's Astrobiology program. For more information on the Astrophysics and Astrochemistry Laboratory, visit our Web site at <http://www.astrochem.org>

**Location:**

Ames Research Center  
Moffet Field, California

**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/oijr/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.