

**Opportunity Title:** Investigations of Molecular Signatures and Organic Matter in Icy Environments of Mars and Ocean Worlds

**Opportunity Reference Code:** 0241-NPP-NOV23-GSFC-Astrobio

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

**Reference Code** 0241-NPP-NOV23-GSFC-Astrobio

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

**Description** Laboratory and field investigations focus on detecting and qualifying biological and abiological signatures, as well as more general characterization of organic matter possibly associated with icy subsurface and surface polar terrain regions of Mars and ocean-plume environments of Ocean Worlds, such as Enceladus. Research topics include: (1) the preservation and destruction processes of biological, ecological, and abiological signatures, (2) developing science methodologies for molecular signature detection in laboratory and field analogs, (3) developing science relationships among markers for habitability and organic components, and (4) developing and testing contamination control approaches that enable the science of topics 1-3.

Studies should take advantage of existing gas chromatography-mass spectrometry facilities laboratory facilities (e.g., GC-MS, GC-MSMS) for the molecular analysis of macromolecules, lipids, amino acids, peptides, and other organic molecules in brine or sediment laden samples. Studies may also leverage thermochemolysis and derivatization sample preparation approaches. Specific research topics should address elements of the 2015 NASA Astrobiology Strategy or supporting science for current and future missions.

**Location:**

Goddard Space Flight Center  
Greenbelt, Maryland

**Field of Science:** Astrobiology

**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/oiir/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



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pending status

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