

Opportunity Title: Organic Complexity Patterns for Life Detection

Opportunity Reference Code: 0242-NPP-NOV23-GSFC-Astrobio

Organization National Aeronautics and Space Administration (NASA)

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

Description Proposals are invited that focus on agnostic biosignature frameworks that investigate organic molecular patterns that can be used to understand the source and physicochemical history of naturally occurring suites of compounds. Potential research projects will explore molecular complexity metrics that can differentiate between biological and abiotic reaction products. This research could encompass methodological as well as analytical elements that inform organic detection and interpretation of planetary analog materials that could include abiotic organic samples (ie. extraterrestrial materials, prebiotic reaction products), biological organic samples, degraded biological organic matter, and environmental samples with mixed organic sources or properties related to targeted solar system objects.

Studies should take advantage of existing ultrahigh resolution Orbitrap mass spectrometry laboratory capability for the molecular analysis of organic molecules in geological, hydrological, and biological samples. Studies may also leverage sample preparation facilities designed for trace-organic studies (including but not limited to: cryomill, accelerated solvent extraction, SPE, and SPME) as well as HPLC for separation and purification. Specific research topics should address elements of the NASA Astrobiology Institute's roadmap, or supporting science for current and future missions, such as method development for detecting organics in surface samples from Mars, Titan, Enceladus, and Europa. Experience in organic geochemistry is preferred and research may include geobiological fieldwork. Experience with coding and scripting in the R environment is also an asset.

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/oiiir/export-control>.



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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.