

Opportunity Title: Agnostic Biosignatures and Planetary Mass Spectrometry

Opportunity Reference Code: 0194-NPP-NOV23-GSFC-Astrobio

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0194-NPP-NOV23-GSFC-Astrobio

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

Description This work is intended to expand our understanding of how the chemical complexity of a molecule identified in a planetary ocean worlds environment may be an indicator of the presence of biology. We will compare the structure of organic compounds produced abiotically such as those extracted from meteorite samples with complex organic compounds produced by living systems. We will utilize tandem mass spectrometer techniques in association with a variety of separation and ionization techniques to explore the hypothesis that there is a certain level of complexity beyond which abiotic production is unlikely. This work will be done in close coordination with Dr. Sarah Johnson leading a team exploring agnostic approaches to life detection (49th Lunar and Planetary Science Conference 19-23 March, 2018, Contribution No. 2083, id.2294) and a research team at the University of Glasgow led by Leroy Cronin that utilizes graph theory to explore molecular complexity (Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, vol. 375, issue 2109, p. 20160342, 2017, DOI:10.1098/rsta.2016.0342).

Location:

Goddard Space Flight Center
Greenbelt, Maryland

Field of Science: Astrobiology

Advisors:

William Brinckerhoff
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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 • **Degree:** Doctoral Degree.



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Requirements