Opportunity Title: Understanding Abiotic Organic Chemistry in Ocean World Environments
Opportunity Reference Code: 0209-NPP-NOV23-JPL-Astrobio

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0209-NPP-NOV23-JPL-Astrobio

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

Description Ocean worlds are of significant interest for finding life in the solar system, since some of these worlds exhibit signs of water-rock chemistry, a past or present liquid water ocean, and geochemical disequilibria that may be able to support life and/or organic chemistry through hydrothermal processes. However, organic detection - even detection of organics that are commonly found in Earth biology - does not necessarily mean life, because there are many processes that produce organics abiotically in geological systems. In order to understand whether future organic detections on the ocean worlds could represent a past or present biosphere, we must be able to distinguish biotic from abiotic organic signatures, and thus we need to fully understand the range of abiotic / prebiotic organic chemistries that are plausible and favorable in ocean world environments. In this project, we are particularly interested in exploring the chemical landscape of organosulfur molecules and organic polymers that might be synthetized hydrothermally and/or via reactions with redox-active minerals. This project would experimentally explore the geochemical synthesis of organic molecules and identify their formation and reaction mechanisms in the presence of ocean world analog minerals and fluids, particularly focusing on simulating the gradients and disequilibrium that could occur in an ocean world hydrothermal system.

Location:
Jet Propulsion Laboratory
Pasadena, California

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.

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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

This opportunity may require the following: 1- Mandatory drug testing; 2-Random drug testing; 3- Testing prior to initiation of fellowship appointment.

Eligibility Requirements

- **Degree:** Doctoral Degree.