

**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 synthesized 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:**

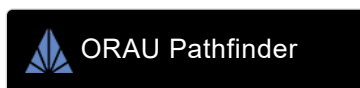
Jet Propulsion Laboratory  
Pasadena, California

**Field of Science:** Astrobiology

**Advisors:**

Laura M. Barge  
laura.m.barge@jpl.nasa.gov  
818-393-8209

**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>.



Whether you are just starting your career or already at a senior level, ORAU offers internships, fellowships, research opportunities, and contract positions that can provide you with invaluable experience. Download the ORAU Pathfinder mobile app and find the right opportunity to propel you along your career path!

Visit ORAU Pathfinder [↗](#)



**Opportunity Title:** Understanding Abiotic Organic Chemistry in Ocean World  
Environments

**Opportunity Reference Code:** 0209-NPP-NOV23-JPL-Astrobio

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.