Opportunity Title: Chemical and physical processes that impact habitability and life-detection investigations
Opportunity Reference Code: 0239-NPP-MAR26-JPL-Astrobio

Organization National Aeronautics and Space Administration (NASA)

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How to Apply All applications must be submitted in Zintellect

Please visit the NASA Postdoctoral Program website for application instructions and requirements: How to Apply | NASA Postdoctoral Program (orau.org)

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

Application Deadline 3/1/2026 6:00:59 PM Eastern Time Zone

Description **About the NASA Postdoctoral Program**

The NASA Postdoctoral Program (NPP) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

Description:

Following the tantalizing detections of organics at target bodies of Enceladus, Mars, and Ceres, and potential access to subsurface reservoirs via plumes (Enceladus and possibly Europa) it is clear that characterization of organic species will continue to be a major focus of Solar System exploration. Accurate determination of the abundances and distributions of abiotic (and possibly even biotic) organics are critical to achieving habitability and life-detection goals for upcoming missions.

Unfortunately, not enough is yet known about how local environmental conditions and instrument/mission parameters influence these measurements. The goal of this NPP work will be to investigate relevant chemical and physical interactions that can affect organic and putative biosignature detections, and to determine environmental conditions and detection methods that promote more reliable results.

Some potential topics of interest include:

- Investigating how chemical and/or physical interactions with complex sample matrices (containing salts, minerals, oxidants, acids, etc.) affect biosignature detection and preservation in relevant Solar System environments. Studies of how these species affect other processes like ionizing radiation or impact-induced fragmentation are also welcome.
- Developing and/or optimizing techniques to improve detection and avoid

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degradation in future in-situ measurements.
- Elucidating the relationship between what is detected, its provenance, and how it relates to the broader science picture (e.g. how does the chemical composition of plume material relate to its subsurface reservoir composition? How do measurements of exposed surface organics differ from subsurface organics on a given body?)

The successful NPP candidate will use flight-relevant techniques and/or laboratory instrumentation including mass spectrometry, liquid or supercritical fluid chromatography, and/or UV/Vis/IR spectroscopy to design a study that addresses outstanding questions regarding organic detection and characterization presently or previously habitable Solar System bodies.

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 pending status

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

Questions about this opportunity? Please email npp@orau.org

Point of Contact Mikeala

Eligibility Requirements
- **Degree:** Doctoral Degree.