

Opportunity Title: Exploring the Astrobiology and Organic Chemistry Potential of Enceladus, Europa, Titan and/or Mars

Opportunity Reference Code: 0318-NPP-NOV26-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 11/1/2026 6:00:59 PM Eastern Time Zone

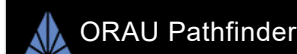
Description About the [NASA Postdoctoral Program](#)

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:

The search for biosignatures and interesting organic chemistry throughout the solar system has accelerated with recent advancements in laboratory techniques, and the current and future discoveries by missions such as Cassini and Europa Clipper. Our group's research in the Planetary Science Section at JPL focuses on groundbreaking, largely laboratory-based work to help interpret measurements made by these and other missions, as well as deepen our understanding of the organic chemistry and potential biochemistry occurring on these planetary bodies.

Current funded research focuses on **hypervelocity impacts of ice grains for Enceladus and/or Europa**. Ocean worlds such as Enceladus and Europa represent high-priority targets for astrobiology-focused missions. Cassini demonstrated the detection of salts and organics in hypervelocity plume flythroughs using impact ionization mass spectrometry with its Cosmic Dust Analyzer (CDA) instrument, and current and future payloads under development could search for biosignatures in plume and ejected particles with the same technique. However, until recently no equivalent laboratory measurements have reproduced the physics of an ice grain impact onto a spaceborne dust detector such as CDA or Europa Clipper's Surface DUST Analyzer (SUDA) instrument using relevant compositions. At



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JPL/Caltech we have a new experimental system called the Hypervelocity Ice grain Impact Validation Experiment (HIIVE) that more closely replicates the hypervelocity sampling process, and will set the standard for SUDA data interpretation by establishing a direct link between the observed mass spectra and ice grain composition. Current HIIVE experiments involve generating a mass spectral library of various salt and organic mixtures in ice grains for the SUDA instrument, and generating hypervelocity ice grain impacts of microbes for the first time to test whether organisms from different habitats in Ocean World analogue environments will generate chemically distinct fatty acid fingerprints when analyzed via impact ionization mass spectrometry. Project proposals are invited that might explore novel ways that our HIIVE ice grain accelerator instrument could be utilized, not only to trace back impact mass spectra to the composition of ice grains, but also whether impacts can generate new compounds if the impacted surface has a contamination layer or coating to replicate a planetary surface. Proposals may also investigate how the presence of mineral dust affects impact ionization, or how biological signals are expressed in the impact mass spectra and how they are affected by the impact velocity.

Field of Science: Astrobiology

Advisor:

Bryana Henderson
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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

Qualifications Interested candidates should have a recent Ph.D. in chemistry, geochemistry, physics or a related discipline in planetary science or astrobiology. Candidates are encouraged to develop a project proposal that enables them to gain experience in a new or tangential field to their previous expertise. Depending on the project proposal, candidates with a background in analytical chemistry, organic chemistry, mass spectrometry, IR/Raman spectroscopy, cryogenics and/or vacuum systems may be preferred but not required.

Point of Contact [Mikeala](#)

Eligibility • **Citizenship:** LPR or U.S. Citizen
Requirements • **Degree:** Doctoral Degree.