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Opportunity Title: Solar System Exploration: Grain Catalysis in the Protosolar Nebula
Opportunity Reference Code: 0157-NPP-MAR26-GSFC-Astrophys

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0157-NPP-MAR26-GSFC-Astrophys

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 4/2/2026 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 origin of life on Earth (and possibly elsewhere) was either influenced by or a product of organic compounds from space. These vital compounds were delivered by comets, meteorites, and IDPs to the early Earth. Such material is delivered today. To understand the results of analyses of organics in natural samples and help us interpret their significance, we perform laboratory experiments to simulate processes, which we suspect contribute to the formation of these organics. In the laboratory, we simulate gas-grain Fischer-Tropsch and Haber-Bosch type reactions catalyzed by synthetic mineral grains and ground minerals, which are similar to those in the proto-Solar nebula. These produce a variety of organic compounds, including amines, nitriles, alkanes, alkynes, amino acids, lipid-like species, alcohols, amines, and amides. These reactions deposit significant amounts of carbonaceous matter onto the grain surfaces and these coatings have been shown to trap noble gases. We believe that such coated grains were incorporated into forming solar system planetesimals, were modified by internal heating and hydration processes and then accreted to the ancient Earth. Thus, we are striving to realistically simulate exogenous processes and characterize the organic material of pre-biotic interest produced therein, including the ratios of trapped noble gases and compare this data to authentic extraterrestrial samples to constrain their formation conditions and their potential impact on the origin of life.

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Location:
Goddard Space Flight Center
Greenbelt, Maryland

Field of Science: Astrophysics

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

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

Point of Contact Mikeala

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