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Opportunity Title: Understanding radiation effects in dust and icy regolith on airless bodies
Opportunity Reference Code: 0322-NPP-MAR25-GSFC-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0322-NPP-MAR25-GSFC-PlanetSci

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 3/1/2025 6:00:59 PM Eastern Time Zone

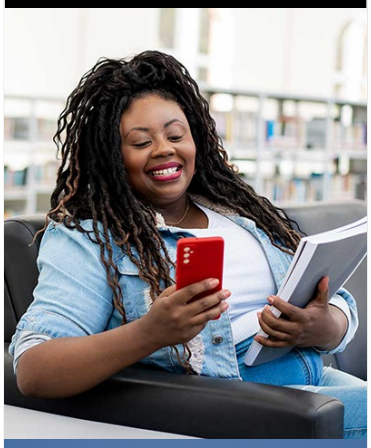
Description **About the NASA Postdoctoral Program**

The NASA Postdoctoral Program (NPP) offers unique research opportunities to highly-talented U.S. and non-U.S. 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 Planetary Magnetospheres Lab (695) in the Solar System Exploration Division (690) at NASA's Goddard Space Flight Center seeks a qualified postdoctoral applicant to carry out experimental studies on a newly built ultra-high vacuum radiation simulation chamber in the SpaceREDI (Radiation Effects in Dust and Ice) laboratory. This position is strictly laboratory based, and the applicant is invited to propose a project using neutral and ion mass spectrometry combined with infra-red spectroscopy to understand the effects of ionizing radiation (i.e., solar wind plasma and photons, magnetospheric plasmas, and cosmic ray particles) in icy regolith analogs representative of comets, polar cold traps at the Moon and Mercury, or icy moons.

Radiation is responsible for numerous observed physical and chemical processes on airless bodies, such as implantation of exogenous species and the formation of new molecules through radiolysis (radiation-induced bond rearrangement), stimulated desorption of surface species and production of a surface-bound exosphere (collisionless atmosphere around airless bodies), and molecular migration and radiation-enhanced diffusion into the subsurface that can create local reservoirs of important species. Studies using mass spectrometry and infrared spectroscopy can determine

NPP NASA Postdoctoral Program
ORAU Pathfinder

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how the physical properties of icy regolith change when exposed to radiation, and the results can provide critical information for the interpretation of observations and development of high-fidelity computational models.

Granular morphology, compositional heterogeneity, and thermal gradients have all been shown to strongly influence radiation, and experiments must be performed to understand of radiation effects in mixed, granular materials that are representative of the composition and structure of airless body regolith. Thus, a major focus of this NPP will the in situ production and characterization of high fidelity icy regolith analogs.

Field of Science: Planetary Science

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

Qualifications The successful candidate will have a Ph.D. or the equivalent degree in Planetary Science, Physics, Geology, Astrophysics, or a related field. Desired laboratory skills include experience with apparatus design and construction of experimental systems, fast ion and electron beams, continuous and pulsed photon sources, ultra-high vacuum techniques, visible and near infrared spectral reflectance measurements, quadrupole mass spectrometers, and associated electronics. Desired computer skills include programming, multidimensional data analysis, LabView, Python, Autodesk Inventor, Solidworks, SIMION, Linux/Mac OS, and Windows OS.

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The successful candidate will have a strong background in at least some of the areas listed above, a proven research ability, and evidence of future research potential. The candidate is expected to be able to work well independently and cooperatively with a team and to communicate the results of his/her research both orally and in writing. Demonstrated written and oral communication skills are highly desirable.

Point of Contact Mikeala Lambertucci

Eligibility Requirements

- **Degree:** Doctoral Degree.