

Opportunity Title: Planetary Science: Geochemistry and Geochronology of Planetary Materials

Opportunity Reference Code: 0103-NPP-NOV23-GSFC-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

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Application Deadline 11/1/2023 6:00:59 PM Eastern Time Zone

Description The history of each planet is told through its rocks - how the minerals are put together, what the minerals are made of, and when the rocks were formed. The Moon is a witness to 4.5 billion years of solar system history, recording planetary differentiation, impact flux, and volatile evolution more completely and more clearly than any other planetary body. Asteroids are fascinating worlds ranging from small bodies containing a record of the earliest solar system processes to differentiated dwarf planets. Mars has a dynamic surface sculpted by almost every major geological process known - vast chasms, broad lava plains, ancient impact basins, and the largest volcano in the solar system. We use multiple analysis techniques to understand the formation, modification, and age of planetary materials to learn about their parent planets.

We solicit research proposals using the Mid-Atlantic Noble Gas Research Laboratory (MNGRL). Some of our current projects include the early impact history of the Moon through noble-gas dating of impact-melt rocks contained in lunar meteorites and Apollo breccia, the impact history of the asteroid belt by examination of meteorite breccias from large main-belt asteroids, age limits on terrestrial impact craters, and, and ages, exposure histories, and thermal history of new and unusual meteorites.

We are also developing a LIBS-MS based technique (the Potassium-Argon Laser Experiment, or KARLE) for in situ planetary isotopic dating for use on future Mars and Moon missions. Research proposals may focus on how in situ K-Ar dating may be used to understand different planetary lithologies, comparing K-Ar and Ar-Ar ages of Martian and lunar rocks that have complex thermal histories, and investigating experimental conditions (pressure, temperature, viewing angle, measurement techniques, etc.) to optimize flight instrument workflow and hardware.

For more information about our group and facilities, please see <http://planetary.msfc.nasa.gov/Main.html>

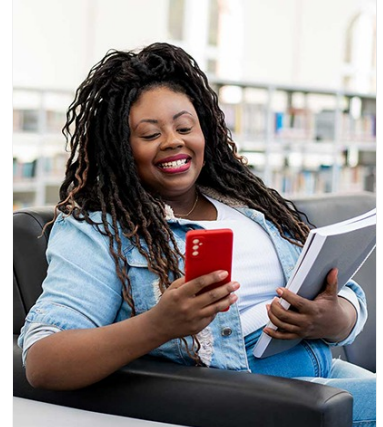
Location:

Goddard Space Flight Center
Greenbelt, Maryland

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/oiiir/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

**Eligibility
Requirements**

- **Degree:** Doctoral Degree.