

Opportunity Title: Radar Sounding of the Martian Polar Layered Deposits

Opportunity Reference Code: 0121-NPP-NOV23-JPL-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 Shallow Radar (SHARAD) instrument aboard the Mars Reconnaissance Orbiter (MRO) has begun operating in orbit around Mars in 2006, and its main science goal is to map dielectric contrasts to depth of several hundred meters. Such contrasts, in turn, can be used to characterize subsurface stratigraphy and interpreted for geologically relevant materials. Among a number of crucial science findings, it has been at the polar deposit where SHARAD has, perhaps, shone at its brightest. SHARAD has confirmed that the bulk composition of the Polar Layered Deposits (PLD) is water ice and revealed detailed stratigraphy in the interior of PLD's. This stratigraphy shows a dominance of depositional and erosional events at both poles, a possible repeatability in layering sequences and trough migration in the Northern PLD, and large bodies of embedded CO₂ ice. One of the outstanding questions about the SHARAD dataset is what actually creates individual radar reflections within the volumes of both the Northern and Southern PLD's. Although it is obvious that these reflections result from variations in dielectric properties across the PLD, it is not known what physical or compositional parameter or parameters control such variations. Further, not knowing what properties control the generation of reflectors substantially limits one's ability of correlating reflections with the influence of climate and environment on the waxing and waning of the PLD over geologic history. This research opportunity is to focus on the correlation of SHARAD PLD stratigraphy with other remote sensing data sets and test possible mechanisms that could control the creation of radar reflectors in the martian PLD's.

Location:

Jet Propulsion Laboratory
Pasadena, California

Field of Science: Planetary Science

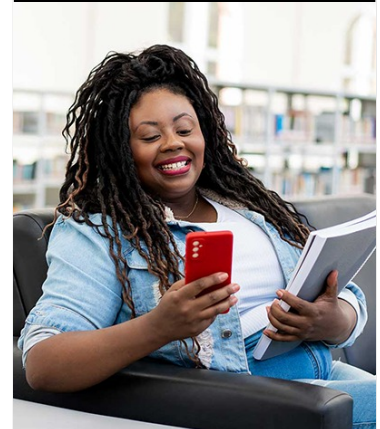
Advisors:

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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;



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- 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.