

Opportunity Title: Lunar Laser Ranging Data Analysis

Opportunity Reference Code: 0018-NPP-NOV23-JPL-PlanetSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0018-NPP-NOV23-JPL-PlanetSci

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

Description Accurate ranges are measured from observatories on the Earth to four retroreflector arrays on the Moon. Fit with an rms scatter of 2 cm, these ranges are sensitive to the lunar orbit and physical librations, the positions of the retroreflectors and observatories, and the Earth's rotation. A comparison of the range data to model calculations yields solutions for a number of physical parameters of interest to lunar science (including origin, evolution, and history of the Moon), gravitational physics (the nature of gravity), geophysics, and geodesy. Recent results include measurement of solid-body tides on the Moon, detection of a fluid lunar core, a test of the equivalence principle, and a limit on rate of change of G. Opportunities exist to improve theories, models, and computational techniques, and many of these approaches can be adapted to other satellites.

Williams, J. G., Boggs, D. H., Yoder, C. F., Ratcliff, J. T., and Dickey, J. O., "Lunar rotational dissipation in solid body and molten core," J. Geophys. Res., vol. 106, 27933-27968, 2001.

Williams, J. G., S. G. Turyshev, and D. H. Boggs, "Progress in lunar laser ranging tests of relativistic gravity," Phys. Rev. Lett., vol. 93, 261101, 2004. [arXiv:gr-qc/0411113]

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;
- 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



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Eligibility Requirements • **Degree:** Doctoral Degree.