

Opportunity Title: A Planetary Broadband Seismometer for the Moon and the Ocean Worlds

Opportunity Reference Code: 0053-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 postdoctoral associate will develop a three axis seismometer which would be 100 times more sensitive than the current state of the art. The enhancement in sensitivity is based on a novel Electrostatic Frequency Reduction (EFR) technique invented by our collaborator. Applicant should read Ref. [1, 2] to gain a knowledge of how EFR works. The seismometer test mass is a cube suspended by 4 springs at the plane of the center of mass. The electronics are based on reading the capacitance between the test mass and a plate mounted rigidly to the ground. A voice coil applies a feedback force to a magnet mounted on the test mass to keep it stationary relative to the ground. The feedback current in the voice coil is proportional to ground acceleration. The work involves mechanical design using SOLIDWORKS, data acquisition using LABVIEW, data analysis using MATLAB, simulation of the feedback loop using MATLAB and/or LABVIEW. The feedback algorithm will eventually be implemented in a computer running a real-time OS. The seismometer will operate in vacuum and be cooled to liquid nitrogen temperature to simulate the environments on icy moons. We seek candidates with experience in these skills, or a subset of them. Candidates should have a Ph. D. in relevant fields like physics, mechanical engineering, aeronautics etc..

References:

- [1] T.C.P. Chui et. al. Lunar and Planetary Science XLVIII (2017), 1660.pdf.
[2] C.E. Griggs et al., Nuclear Phys. B (Proc. Suppl.) 166, 209-213, 2007

Location:

Jet Propulsion Laboratory
Pasadena, California

Field of Science: Planetary Science

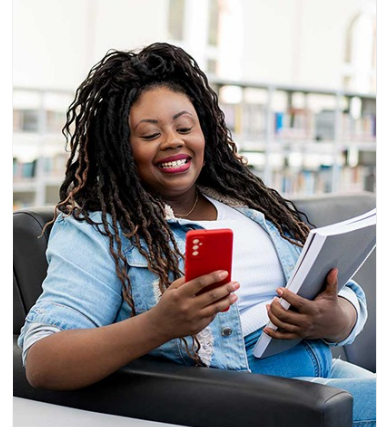
Advisors:

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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.