

**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)

**Reference Code** 0053-NPP-NOV23-JPL-PlanetSci

**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

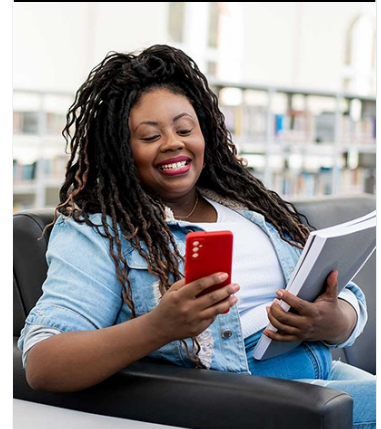
**Advisors:**

Talso Chui  
Talso.C.Chui@jpl.nasa.gov  
818 354-3104

**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;



Whether you are just starting your career or already at a senior level, ORAU offers internships, fellowships, research opportunities, and contract positions that can provide you with invaluable experience. Download the ORAU Pathfinder mobile app and find the right opportunity to propel you along your career path!

Visit ORAU Pathfinder [↗](#)



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

**Opportunity Reference Code:** 0053-NPP-NOV23-JPL-PlanetSci

- 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.