Opportunity Title: Sea Level Changes from Ice Mass and Glacial Isostatic Adjustment: Coastal Subsidence and Global Water Mass Balance in the 20th and 21st Centuries
Opportunity Reference Code: 0127-NPP-JUL24-JPL-EarthSci

Organization National Aeronautics and Space Administration (NASA)

Reference Code 0127-NPP-JUL24-JPL-EarthSci

Application Deadline 7/1/2024 6:00:59 PM Eastern Time Zone

Description Global and regional sea levels are influenced by gravitational-elastic and viscous motions of the solid Earth on a spectrum of wavelengths and time scales. The research opportunity seeks to use Glacial Isostatic adjustment (GIA) models that are constrained by global seismology, laboratory rock creep experiments, paleo-sea-level records and the modern tide gauge records, 3-D GPS crustal motion data in order to improve our understanding and interpretation of sea-level variability and gravity trends as measured from space using GRACE-Follow on and JASON-3 data sets. A unique aspect of this research is that we shall develop a strong interface to the computationally state-of-the-art ice sheet simulations with Ice Sheet System Model framework. Data that can to be used to constrain GIA models have a strongly interdisciplinary flavor. The data include, but are not restricted to, past sea-level indicators, tide-gauge, GPS crustal motions to terrestrial and space gravimetry and geodesy. Of special focus in this work will be to provide the Gravity Recovery and Climate Experiment (GRACE) science analyses with improved GIA predictions, based on both spherically symmetric and fully 3-D earth models and using all multidisciplinary data sets available. Properly treating regional sea-level data and future change scenarios requires fully understanding and modeling GIA as well as the gravitational interactions between rapidly varying continental load masses (such as the ice mass loss in Greenland) with the changes in equipotential surfaces near the Earth‘s present position of mean sea level. A successful post-doctoral candidate should have the capacity to both understand the basic underlying theory and be versant in the contemporary numerical methods (and their limitations) for computing sea-level, gravity and crustal surface topographic change in the context of GIA and present-day global and regional mass transport. The successful proposer should have a strong background in modern Fortran and other scientific computer languages and be familiar with complex numerical procedures for solving global geophysics and geodesy problems. The candidate should have familiarity with the classical Farrell and Clark sea-level equations and viscoelastic theory for a self-gravitating viscoelastic spherical planet, construction and implementation of advanced theories for transient viscoelastic rheology and use of Bayesian statistical analysis. Experience with parallel processing techniques is also important. A basic understanding of the data sets and their use for constraining regional and global GIA is desirable.

Location:
Jet Propulsion Laboratory
Pasadena, California

Field of Science: Earth 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

Eligibility Requirements

- **Degree:** Doctoral Degree.