

**Opportunity Title:** Short-term ice dynamics in Greenland and Antarctica

**Opportunity Reference Code:** 0141-NPP-NOV23-JPL-EarthSci

**Organization** National Aeronautics and Space Administration (NASA)

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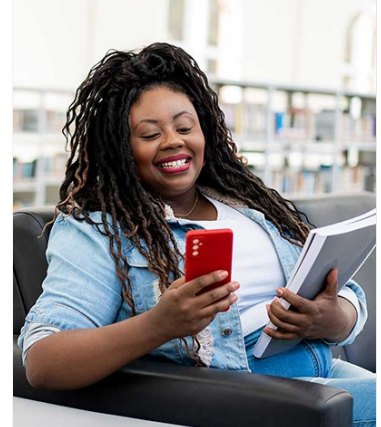
**Application Deadline** 11/1/2023 6:00:59 PM Eastern Time Zone

**Description** Recent studies have demonstrated that glaciers play a central role in the evolution of ice sheets, and ice sheet numerical models indicate that the largest uncertainties in sea level projection are caused by uncertainties in the evolution of ice stream dynamics in Greenland and Antarctica. In this research, we employ satellite radar interferometry (InSAR) to study the ice dynamics of glaciers in Greenland and Antarctica, their interaction with the surrounding ocean, and their impact on past, present and future ice sheet mass balance. Among the various InSAR data sources, the ASI's Cosmo-SkyMed mission is the only mission capable of short time repeat (1-day, 3-day, 6-day, etc.) over the fastest evolving glaciers in the world. This capability makes it unique for mapping grounding zones, i.e. where the glaciers detach from the bed and become afloat in the ocean, and keep track of the fast motion of these ice streams to the ocean using only the interferometric phase. In this research, we will analyze data collected by Cosmo Skymed - and other sensors - along various tracks and look angles to study the grounding line dynamics associated with calving events, ice ocean interaction, and glacier thinning in various parts of Greenland and Antarctica and document their impact/response on ice dynamics. This information will provide new insights into ice dynamics that will benefit ice sheet numerical modeling techniques used to project the evolution of these glaciers in the coming centuries. In particular, we work with the UC Irvine/Jet Propulsion Laboratory Ice Sheet System Model (ISSM), which is coupled with the MITgcm ocean model and various atmospheric models, to project the evolution of ice sheets in a warming climate. Our project will therefore closely interface between the remote sensing results and the needs of ice sheet numerical models to improve the reliability of these models at projecting ice sheet evolution, ice sheet mass balance, and contribution to sea level change. Candidates should have a PhD degree in Electrical Engineering, Physics, Computer Science, Geography or Earth Science. A strong background in remote sensing and especially in synthetic aperture radar is preferred, basic programming skills and a strong interest for glaciology and climate change. The candidate will work with our research group at JPL and researchers at UC Irvine to develop advanced ways of analyzing InSAR data over ice sheets and learn about physical processes controlling ice stream dynamics.

**Location:**

Jet Propulsion Laboratory  
Pasadena, California

**Field of Science:**Earth Science



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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/oiiir/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

**Qualifications**

- Eligibility Requirements**
- **Degree:** Doctoral Degree.