

Opportunity Title: Understand physical processes governing ice-ocean interactions in ice-shelf cavities

Opportunity Reference Code: 0347-NPP-NOV26-JPL-EarthSci

Organization National Aeronautics and Space Administration (NASA)

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How to Apply All applications must be submitted in [Zintellect](#)

Please visit the NASA Postdoctoral Program website for application instructions and requirements: [How to Apply | NASA Postdoctoral Program \(orau.org\)](#).

A complete application to the NASA Postdoctoral Program includes:

1. Research proposal
2. Three letters of recommendation
3. Official doctoral transcript documents

Application Deadline 11/1/2026 6:00:59 PM Eastern Time Zone

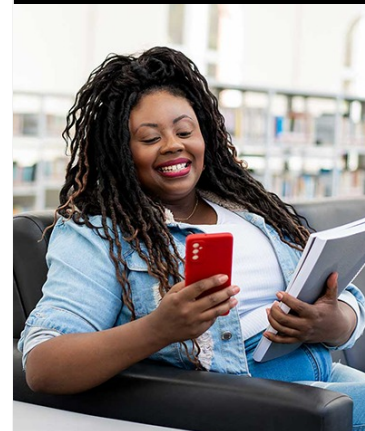
Description About the [NASA Postdoctoral Program](#)

The [NASA Postdoctoral Program \(NPP\)](#) offers unique research opportunities to highly-talented scientists to engage in ongoing NASA research projects at a NASA Center, NASA Headquarters, or at a NASA-affiliated research institute. These one- to three-year fellowships are competitive and are designed to advance NASA's missions in space science, Earth science, aeronautics, space operations, exploration systems, and astrobiology.

Description:

Nearly half of Antarctica's ice mass loss comes from melting at the base of the ice shelf, known as basal melting (Rignot et al, 2013). As the ocean warms, we expect this contribution to increase. Depending on the water masses that reach the deepest locations of the ice shelf, called the grounding line, ice shelves can be broadly classified as warm or cold (Fricker et al, 2025). Different processes play a pivotal role in these cavities.

This research opportunity aims to understand the physical processes governing ice-ocean interactions in these different ice-shelf cavities using a combination of ocean models, available in-situ data, and satellite observations. The study builds on analyses from a consortium of models, such as *Estimating the Circulation and Climate of the Ocean* (ECCO, <http://www.ecco-group.org/>), and LLC configurations, satellite observations such as ICESat-2 or equivalent products, hydrographic datasets, and available in-situ measurements. Particular emphasis will be placed on understanding tidal and seasonal variability in basal melt rates and ocean circulation pathways. Research opportunities include analyzing observational and modeling results, developing process-modeling studies and diagnostics, translating process-level understanding into



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parameterizations for realistic Antarctic ice shelves, and investigating the strengths and limitations of different modeling systems.

The results could support targeted high-resolution regional modeling studies, inform optimal locations for deploying field instruments such as IceNode, improve estimates and parameterizations of basal melt for large-scale ice-sheet models such as ISSM, and provide a pathway toward increasingly integrated model–observation frameworks, including data assimilation.

References:

E Rignot, S Jacobs, J Mouginot, B Scheuchl, Ice-shelf melting around Antarctica. *Science* **341**, 266–270 (2013).

H Fricker, B K Galton-Fenzi, Catherine Walker, Bryony Freer, Laurie Padman, and Robert Deconto, Antarctica in 2025: Drivers of deep uncertainty in projected ice loss. *Science* **387**,601-609(2025).DOI: [10.1126/science.adt9619](https://doi.org/10.1126/science.adt9619)

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/oirr/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

Questions about this opportunity? Please email npp@orau.org

Qualifications PhD in Earth Science, remote sensing, oceanography, or equivalent
Experience with Mitgcm, satellite data processing, and in-situ data analysis preferred.
Understanding of the processes happening at the ice-ocean interface is strongly desired.

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Point of Contact [Mikeala](#)

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