

## **PhD Position on Modeling the Fracture Mechanics of Antarctic Ice Shelves and Glaciers**

The Computational Mechanics and Physics Laboratory at Vanderbilt University is seeking PhD students interested in the area of computational solid and fluid mechanics with applications to glaciology. The specific research project is described below:

**Fracture Mechanics of Antarctic Ice Shelves and Glaciers:** This project aims to provide fundamental understanding of iceberg calving by advancing the frontiers in computational fracture mechanics and nonlinear continuum mechanics and translating it to glaciology. The project investigates crevasse propagation using poro-damage mechanics models for hydrofracture that are consistent with nonlinear viscous ice rheology, along with the thermodynamics of refreezing in narrow crevasses at meter length scales. It will develop a fracture-physics based scheme to better represent calving in ice sheet models using a multiscale method. The effort will also address research questions related to calving behavior of floating ice shelves and glaciers, with the goal of enabling more reliable prediction of calving fronts in whole-Antarctic ice-sheet simulations over decadal-to-millennial time scales. <https://my.vanderbilt.edu/cpml/research/nsf-plr-1341428/>  
<https://my.vanderbilt.edu/cpml/research/nsf-plr-1847173/>

**Qualifications:** Applicants should have a Master's or Bachelor's degrees in Civil or Mechanical Engineering, Earth and Environmental Science, Engineering Mechanics, Physics, Applied Mathematics, or a relevant field. The ideal candidate will have a background in continuum mechanics, fracture mechanics and finite element methods. Essential requirements are strong quantitative and analytical skills, solid knowledge and experience in scientific programming (with Python or C/C++ or Fortran), excellent grades and the ability to learn and employ new numerical methods and technologies from different disciplines. Previous research experience in the field of computational modeling and publications in reputed international journals is a plus.

**Timeline:** The starting date can be in Spring or Fall 2020. Applications are accepted until the positions are filled. Positions are for 4-6 years. The candidate will be enrolled as PhD student at the Department of Civil and Environmental Engineering.

**Applicants contact** Prof. Ravindra Duddu [ravindra.duddu@vanderbilt.edu](mailto:ravindra.duddu@vanderbilt.edu) with their CV.

**Vanderbilt University**, located in Nashville, Tennessee, is a leading research-intensive university in the United States in engineering, science and technology. Vanderbilt faculty and researchers are recognized for their pioneering research, scholarship, and leadership in higher education.