VANDERBILT UNIVERSITY School of Engineering

DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING

Seminar

Friday,

April 7, 2023

1:30 pm – 2:30 pm

FGH 138

CEE & EES EMERGING SCHOLAR SEMINAR SERIES

"ICE SHEET CHANGE: A MICROSTRUCTURAL PERSPECTIVE"

DR. MEGHANA RANGANATHAN

NOAA CLIMATE & GLOBAL CHANGE POSTDOCTORAL FELLOW
GEORGIA INSTITUTE OF TECHNOLOGY

ABSTRACT

Most of the mass loss from the Antarctic Ice Sheet occurs by dynamic flow of glacier ice from the interior of the ice sheet to the margins. At the margins, the ice flows on the ocean, ultimately breaks apart into icebergs, and melts into the ocean. Due to anthropogenic shifts in the climate system, many glaciers in Antarctica are accelerating and thus increasing the contribution of Antarctica to global sea-level rise. Understanding, and subsequently modeling, the behavior of these Antarctic glaciers – specifically, the processes of ice flow and ice fracture – is necessary to constrain the impacts that ice sheet and glacier changes will have on the Earth system and on communities around the world. I take a three-pronged approach to this question: harnessing satellite and field observations, developing theory, and improving ice flow models to represent completely the feedbacks that drive changes to ice flow from physically-derived models. In this talk, I will discuss methods of parameterizing microphysical processes of ice flow and integrating these processes into large-scale ice sheet models, enabling a more complete view of the drivers to accelerating mass loss. The ultimate goal is a path forward for modeling future ice flow more accurately, which will improve projections of future sea-level rise and our understanding of the role of the cryosphere in the earth and climate system.

BIOGRAPHY

Meghana Ranganathan is a glaciologist and climate scientist. She received her undergraduate degree in Mathematics from Swarthmore College and her PhD in climate science from MIT, and she is now a postdoc at Georgia Tech. Her research focuses on improving our physical understanding of ice sheet dynamics and our ice sheet models, with the ultimate goal of improving sea-level rise projections.