



The University of Texas at San Antonio™

**DATE:**  
**Friday,**  
**February 26, 2021**

**TIME:**  
**12:00-1:00pm CDT**

**LOCATION:**  
**via Zoom (Click**  
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# NASA MIRO CAMEE

CENTER FOR ADVANCED MEASUREMENTS IN EXTREME ENVIRONMENTS

## PRESENTS:

**Dr. Sonya Legg** is a Senior Research Oceanographer and Lecturer in the Atmospheric and Oceanic Sciences Program at Princeton University. She is also the Associate Director of the Cooperative Institute for Modeling the Earth System at Princeton University and a member of CAMEE's External Advisory Committee.

**Title:** *Dense bottom currents in the high-latitude ocean, and their representation in climate models*

### Abstract:

Dense water formation in high-latitude shelf regions supplies abyssal water masses such as Antarctic Bottom Water and contributes to interior water masses in the Arctic. As the dense water moves over topographic features on its way to the deep ocean, the water properties can be modified by mixing with overlying water masses. Here I highlight the role of submesoscale instabilities in generating mixing and exchange between the bottom current and overlying water. Submesoscale instabilities, including symmetric and centrifugal instability, occur on length-scales smaller than geostrophic eddies, but larger than 3-dimensional turbulence. An example of possible submesoscale instability is seen in observations from the Orkney Passage, where dense water from the Weddell Sea is moving into the Scotia Sea, and numerical simulations help to identify the factors controlling the location and magnitude of the unstable region. Another potential location for symmetric instability is dense overflows in the Arctic. The possibilities for incorporating these processes into climate models will be explored.

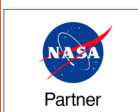
More details of Dr. Legg's Research: <https://scholar.princeton.edu/sonyalegg/home>

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