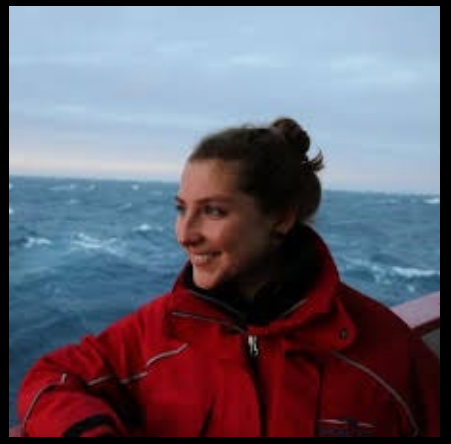
Join this UCT-SANCOR Seminar By

Dr. Katherine Hutchinson

(CNRS - Sorbonne - LOCEAN – NEMO, France)



Thursday, 13 March

13h00 SAST

UCT Oceanography Seminar Room (map) or Online (link)

The ocean beneath: observations and modelling of Antarctic ocean - ice shelf interactions

Overview

Antarctic Bottom Water (AABW) is the densest and deepest water mass, formed by complex interactions between the atmosphere, ice sheets, sea ice, and ocean. It accounts for about 35% of the global ocean’s volume and circulates as the lower branch of the Meridional Overturning Circulation (MOC). AABW formation is driven by complex ice-ocean-bathymetry interactions beneath and near the Antarctic ice sheet's floating margins. These processes are difficult to observe and poorly represented in ocean models. None of the CMIP6 models, which informed the last IPCC report, explicitly simulate circulation within ice shelf cavities, neglecting crucial feedbacks under different emission scenarios. Recent observations show AABW is warming and freshening, raising concerns about the future stability of the MOC. Gaining a deeper understanding of these processes is now a priority.

In my seminar, I will provide an overview of AABW, its formation, and the alterations observed under climate change. I will then discuss the 2019 Weddell Sea Expedition, where South African engineers and scientists conducted 29 CTD casts, offering valuable insights into water mass characteristics in a key AABW source region. I will explain how these observations led to a critical assessment of ocean model capabilities, presenting my work on improving AABW precursors in the NEMO model. Finally, I will highlight plans to enhance these processes in the next generation of climate models (CMIP7) and host a discussion on bridging the gap between observations and modeling in oceanographic research.

About the speaker

Dr. Katherine Hutchinson, a UCT alumnus, completed her PhD in 2018 with the Department of Oceanography and held a short postdoctoral position from 2018 to 2019. During her studies and research in South Africa, Katherine focused on ocean observations, participating in 8 research cruises in 8 years. In 2019, Katherine shifted her focus and accepted a postdoctoral research position at Sorbonne University in Paris, working with the NEMO ocean model. This marked the beginning of an exciting new adventure, and in 2020, Katherine was awarded a Marie Skłodowska-Curie Actions fellowship to explore Antarctic ocean-ice shelf interactions through modeling. After just 18 months in the fellowship, a permanent position became available within the NEMO group, and Katherine eagerly accepted the opportunity to stay in France and further develop her expertise in ocean models. Now serving as NEMO Project Manager, Katherine spends the majority of her time coordinating the work of the NEMO Systems Team. Despite her managerial role, she continues to actively contribute to research and modeling of the Antarctic Ocean and ice shelves through collaborative efforts with both local and international scientists.