**Project title:** Climate interactions between the Southern Ocean and the Antarctic Ice Sheet (Ref: OP2164)

**Keywords:** climate change, sea level rise, Antarctica, oceans, ice

**One Planet Research Theme:**
Climate & Climate Change ☒ | Earth System Processes ☒ | Anthropocene ☐ | Environmental Informatics ☐

**Lead Supervisor:** Dr. Jan De Rydt

**Key Research Gaps and Questions:**

*Can we reliably simulate how the Antarctic Ice Sheet will respond to increasing ocean temperatures?*

*How much will Antarctica contribute to global sea level rise over the next decades to centuries?*

**Project Description:**

In this project you will work with a world-leading team of glaciologists and oceanographers at Northumbria and Newcastle University to advance our understanding of Antarctica's present-day and future contribution to global sea level rise. You will use state-of-the-art computer codes to simulate the dynamics of the Southern Ocean and Antarctic Ice Sheet, their interactions, and their response to climate change over the next decades to centuries.

The Antarctic Ice Sheet is one of the biggest contributors to global sea level rise at present due to the rapidly increasing discharge of ice into the ocean. The rate of ice loss is expected to keep rising in the near future, primarily in response to the increasing heat content of the surrounding ocean. Rising ocean temperatures around Antarctica are closely linked to anthropogenic climate change. However, it remains uncertain how exactly these warming waters will affect the ice dynamics and Antarctica's future contribution to global sea level rise.

In this project you will learn and work with state-of-the-art ocean and ice models and high-performance computing facilities to address these important questions. Training will be offered in oceanography, glaciology and numerical modelling, and there will be an opportunity to attend summer schools in Svalbard, Paris and the Alps to gain further skills in fluid dynamics, glaciology and fieldwork. Your work will be closely linked to ongoing large international collaborations at Northumbria (the EU projects TiPACCs and Protect) and international model-intercomparison projects (e.g. MISOMIP). You will be encouraged and supported to contribute to these projects, and to participate in UK and international conferences to discuss with colleagues and to promote your research.

**Prerequisites:**

If you have strong numerical skills and a good background in math, physics, environmental sciences and/or programming, this project is well suited for you. An undergraduate or MSc degree in physics, mathematics or environmental sciences is essential. For more information, please contact Jan De Rydt (jan.rydt@northumbria.ac.uk).