



Fully funded PhD Studentship available

**Maynooth University
Ollscoil Mhá Nuad**

**Department of Geography
ICARUS (Irish Climate Analysis and Research Units)**

AMOC/Gulf Stream System Reconstructions

Applications are invited from suitably qualified candidates for a full-time PhD student to work on the SFI iCRAG funded project MACMOMO (**M**id-20th Century **A**tlantic **C**irculation informed by **M**odern **O**bservations and **M**odels). The PhD will revisit historical ship hydrographic observations of temperature and salinity and use these observations to estimate the mid-20th century Atlantic Meridional Overturning Circulation. This research will be critical in informing our confidence in climate models ability to reproduce ocean circulation variability and in understanding 20th century climate.

Equality and the promotion of inclusion are key values that we are proud to promote. We would like to encourage applications from women, people living with disabilities, and those from the LGBT+ and Black, Asian, Traveller, and Minority Ethnic communities. We would also like to encourage applicants returning to education following absence due to illness, parental, or personal circumstances. The position will be based between Maynooth University and the Marine Institute and we will endeavour to accommodate your needs for flexible working.

The Project

The Atlantic Meridional Overturning Circulation (AMOC) or Gulf Stream System is a system of ocean currents that plays an important role in maintaining the mild climate of northwestern Europe. A consistent projection from coupled climate models is that the AMOC will weaken in the coming decades due to rising greenhouse gas emissions.

However, faith in the reliability of these model projections has been questioned due to a growing body of evidence that these climate models disagree with observational proxies for the AMOC in particular in the mid-20th century. In turn, the reliability of these observational proxies has been questioned as they are not direct observations of the AMOC.

This project will contribute to this pressing debate by calculating the AMOC from direct observations, revisiting the archive of observations, in particular, from the International Geophysical Year 1957/58. The project will bring a new insight to these data by 1. leveraging the much better understanding of direct AMOC observations from projects such as the RAPID project (since 2004) and hydrographic data including the Irish-led GO-SHIP section at 47°N and 2. using a machine learning framework in historical climate models to better constrain and understand the uncertainty associated with these direct mid- 20th century AMOC estimates.

The successful candidate will work on investigating changes in the mid-20th century Atlantic with a view to placing this in the context of a changing climate. The PhD will use a freely, available historic and modern datasets, and appropriate models for the investigations.

Requirements

- Relevant 2:1 degree (or higher) in Geography/Geoscience, Environmental Science, Physics, Mathematics, Engineering, Computer Science, Statistics, or similar qualification
- Excellent written and verbal communication and presentation skills in English
- Experience of coding in one or more of Matlab, R, Python, or equivalent is desirable

Award

The successful candidate will be enrolled for a 48-month (Structured) PhD programme at ICARUS, Department of Geography, Maynooth University. The Fellowship provides University fees and a stipend of €18,500 per annum over four years. Funds for project costs are also provided.

Start date: September/October 2022

Further Information

Dr Gerard McCarthy
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Application Procedure

Send a curriculum vitae and a cover letter to gerard.mccarthy@mu.ie with MACMOMO PHD in the subject line.

Closing Date: 23:30hrs (local Irish time) on Sunday, 7th August 2022.