

## **PhD position on Antarctic Climate Causality: Unraveling links between the components of the system and their variability**

A consortium of UCLouvain and KU Leuven is seeking a PhD student to work in the framework of the ACCU project (Antarctic Climate Causality: Unraveling links between the components of the system and their variability). You will be working in three groups with complementary expertise. The group of Prof. Hugues Goosse is specialized in analyzing changes in the sea ice-ocean system, using a variety of tools and models, in particular the ice-ocean model NEMO that will be applied in ACCU. The group of Prof. Nicole van Lipzig has expertise in atmospheric processes. They develop and employ regional climate models to study climate change processes in different regions of the world including Antarctica. The team of Prof. Stef Lhermitte works on methods (e.g., remote sensing machine learning) for quantifying the effect of climate (change) on snow/ice, vegetation dynamics, etc. and determine their (climate) feedbacks.

### **Project**

Antarctica and the Southern Ocean play a key role in the Earth's climate system, influencing global heat balance and carbon uptake. Recent anomalies, including a drastic sea ice decline, anomalous snowfall, and unprecedented heat waves, challenge our understanding of the region's response to climate change. This project aims at an improved understanding of recent changes occurring in the Antarctic climate by investigating the interconnections between the ice sheet surface mass balance (SMB), sea ice, ocean temperature, and ice shelf melt, utilizing observations and a recently developed fully coupled ice-sheet-ocean-sea-ice-atmosphere-land model, PARASO, covering Antarctica and the Southern Ocean. The interactions between climate components cover both direct links and indirect links due to varying large-scale atmospheric processes. The methodology integrates observations and simulations, employing causal frameworks to identify relationships. The work packages involve identifying links between atmospheric circulation, sea ice, and SMB variability from observations (WP1), unravelling the role of large-scale atmospheric variability (WP2), exploring potential feedbacks related to sea ice changes (WP3), and synthesizing contributions to recent and future climate changes (WP4). By employing advanced causal inference methods, the project strives to overcome challenges in attributing causality from observational data. In a complementary way, the PARASO model allows for a comprehensive analysis of the interplay between different components that cannot be identified from observations alone. Moreover, the model will be used for future Antarctic climate projections. This proposal's outcomes will advance our understanding of recent Antarctic climate changes and their interlinkage, offering insights into the future of the coupled Antarctic climate system.

## **Profile**

Required qualifications:

- To have a Master degree at the start of the project (1 Oct 2024) in Earth - or Environmental Science, Climatology or related field (physics, bioscience engineering, geography, meteorology, oceanography, mathematics, informatics, civil engineering, etc.);
- To have experience in computational programming and in managing large datasets;
- To have demonstrated verbal and written communication skills in English;
- To have a collaborative mindset: Enjoys working with others to achieve common objectives.

## **Offer**

PhD Candidate, expected to obtain a joint PhD of UC Louvain and KU Leuven;

Starting date preferably 1 October 2024;

Full time position for 48 months of which the first 24 months at KU Leuven and the second 24 months at UC Louvain;

Location: Department Earth and Environmental Sciences, KU Leuven, Leuven, Belgium and Earth and Life Institute, Louvain-la-Neuve, Belgium;

Net monthly salary of about 2400 €, depending on personal situation. This includes social insurance. Transportation to and from the workplace is covered;

Contribution to educational activities is expected for about 10% of your time.

## **Interested?**

Applicants should send (i) a statement of experience, qualification and interest, (ii) a complete CV, (iii) academic transcripts and (iv) the names and e-mail of at least two references to the online application system of KU Leuven.

Tentative dates for the interview are 8 May and 13 May 2024 using teleconferencing

You can apply for this job no later than April 29, 2024 via [KU Leuven Vacancies | PhD position on Antarctic Climate Causality](#). Applications by email will not be considered.

For more information please contact Prof. Hugues Goosse tel.: +32 10 47 32 98, mail [hugues.goose@uclouvain.be](mailto:hugues.goose@uclouvain.be), Prof. Nicole Van Lipzig, tel.: +32 16 32 64 53, mail:

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KU Leuven and UCLouvain seek to foster an environment where all talents can flourish, regardless of gender, age, cultural background, nationality or impairments. If you have any questions relating to accessibility or support, please contact us at [diversiteit.HR@kuleuven.be](mailto:diversiteit.HR@kuleuven.be).