



## **International Research Training Group ArcTrain: Processes and impacts of climate change in the North Atlantic Ocean and the Canadian Arctic**

The DFG-funded International Research Training Group ArcTrain, a collaborative project between the University of Bremen, the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, and a consortium of eight Canadian universities invites applications for a

### **PhD position**

in the area of remote sensing of sea ice in the framework of project HB-01: **Consequences of a changing Arctic for the seasonality of sea ice growth and melting: New understanding from satellite remote sensing and the MOSAiC expedition.**

Together with the shrinking Arctic sea ice cover the length of the melting season is increasing. The ice is getting thinner and breaks up earlier in the year, which creates more leads. Warmer temperatures change the metamorphism of snow on top of the sea ice and more refrozen melt layers and crusts can occur. These processes have consequences for the coupled Arctic climate system by, for example, changing the ocean to atmosphere energy and gas fluxes. Current satellite remote sensing methods can observe some but not all of these processes on an Arctic-wide scale. The largest Arctic research expedition MOSAiC (<https://www.mosaic-expedition.org>) is taking place from September 2019 to September 2020, when the research icebreaker Polarstern will drift with the ice. This interdisciplinary experiment has an extensive remote sensing program, which will enhance our understanding of the coupled Arctic climate system and the regional and global consequences of Arctic climate change by improving weather and climate predictions.

The PhD project aims to increase our understanding of the seasonal cycle of energy fluxes from the ocean through the sea ice and snow to the atmosphere using remote sensing observations. The full seasonal cycle of MOSAiC sea ice and snow measurements will be used to improve our understanding of the ocean to atmosphere energy transfer and develop new satellite remote sensing methods. In a second step the new satellite methods will be applied Arctic-wide. Observations in the microwave spectrum have the advantage of being available year-round independent of sunlight and clouds. MOSAiC offers the unique opportunity of connecting active and passive microwave measurements with in-situ observations of ice and snow for a full year. The seasonal development of these measurements will be analysed to better constrain the influence of ice type, snow properties, melt-refreeze-cycles on the microwave signal. Airborne observations will help to apply results regionally and Arctic-wide using SAR, scatterometer, and microwave radiometer satellites.

We are searching for an enthusiastic and committed researcher with interest in remote sensing and sea ice physics. The PhD student will be part of the Remote Sensing of Polar Regions group ([www.seaice.uni-bremen.de](http://www.seaice.uni-bremen.de)) at the Institute of Environmental Physics, University of Bremen, working under the supervision of Dr. Gunnar Spreen. A research stay is envisaged at the McGill University in Montréal or University of Calgary.

### **Requirements:**

- MSc or equivalent qualification in physics, oceanography, meteorology, remote sensing, or related fields
- Skills in scientific computer programming (e.g., Python, Matlab, IDL, or similar)
- Prior experience in the fields of remote sensing, sea ice physics, and climate science is advantageous
- Applicants should be proficient in English, have excellent skills in scientific writing, and enjoy working in an international and interdisciplinary team.

The position is for a fixed term of 3 years. It is funded by the German Science Foundation (DFG). The earliest starting date is June 1<sup>st</sup>, 2019. Salary corresponds to 2/3 TV-L E13.

Applicants should submit under the reference number **A108/19 (HB-01/3)** their letter of motivation, a CV including copies of certificates, a publication list if applicable, and contact information of two referees. Documents should be submitted electronically as a PDF file (maximum size 2 MB) to [arctrain@marum.de](mailto:arctrain@marum.de). The call is open until the position is filled. The review of applications will commence on May 24<sup>th</sup> 2019.

The University of Bremen has received a number of awards for its gender and diversity policies and is particularly aiming to increase the number of female researchers. Applications from female candidates, international applications and applications of academics with a migration background are explicitly welcome. Disabled persons with the same professional and personal qualifications will be given preference.

For further information, please contact **Dr. Gunnar Spreen** ([gunnar.spreen@uni-bremen.de](mailto:gunnar.spreen@uni-bremen.de)).