



Climate and Environmental Physics, Sidlerstrasse 5, CH-3012 Bern

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**UNIVERSITÄT  
BERN**

Faculty of Science

Physics Institute

**Climate and Environmental Physics**

The Division of Climate- and Environmental Physics, Physics Institute, University of Bern opens one **PhD position** in ocean biogeochemical modeling under the title:

### **Arctic Ocean ecosystems in the past, present, and future and the impact of carbon and nutrient fluxes from rivers and coastal erosion**

The position is part of the SNF-funded project “Stressors of the Arctic Ocean Ecosystem over the 21st Century (ArcticEco)”. ArcticEco aims at providing improved projections of Arctic Ocean ecosystem drivers, such as ocean acidification and net primary production using Earth System Models and observations. The successful applicant will be integrated into the ocean modelling and ocean biogeochemical modeling groups at the University of Bern and will have the opportunity to work with and visit project collaborators in Switzerland, Europe, and the United States.

#### **Project background**

The Arctic Ocean is home to a unique ecosystem that supports extraordinary wildlife. With climate change, the Arctic is undergoing unprecedented changes that affect the Arctic Ocean ecosystem and fisheries via changes in net primary production (NPP) or ocean acidification (OA).

In this rapidly changing Arctic Ocean, reliable projections of the Arctic Ocean NPP and OA are essential for effective and proactive stewardship of the Arctic Ocean ecosystem and the fisheries it supports. The main tools for these projections are global Earth System Models (ESMs). Unfortunately, these ESMs struggle to represent present-day and future Arctic Ocean NPP and OA despite continuous model development and increased model resolution.

ArcticEco will provide much needed more reliable projections of Arctic Ocean NPP and OA. Within ArcticECO, the successful applicant will create new temporally and spatially resolved forcing files for Arctic carbon, alkalinity, and nutrient fluxes from rivers and coastal erosion using the most recent observations of riverine fluxes from the Arctic Great River Observatory and of coastal and subsea erosion for this project and the wider ESM and modelling community. These modern forcing files will be extrapolated in time over the historical period since 1850 and over the 21<sup>st</sup> century under different warming scenarios. Eventually, the applicant will use these forcing files with an Arctic-specific version of the ESM from the Geophysical

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Fluid Dynamics Laboratory in Princeton to provide an assessment of the past, present, and future of the Arctic Ocean NPP and OA.

## Qualifications

We are looking for a highly motivated PhD-candidate with a strong drive to use and develop Earth System Models, to collect and synthesize observational data, and to be part of a lively and motivated team of climate scientists. Applicants should ideally have strong analytical, numerical, and mathematical skills. Prior experience in programming (e.g. C++, Python, Matlab, Fortran) is necessary. A background in physics, chemistry and or mathematics is an advantage but not a strict requirement. Good communication skills in English (both verbal and written) and willingness to closely collaborate with colleagues at the University of Bern and beyond are expected.

## What we offer

The Climate and Environmental Physics Institute at the University of Bern offers a highly interdisciplinary and team-oriented work environment. We strive to provide the best work and life environment for all candidates irrespective of gender, disability, marital or parental status, racial, ethnic or social origin, color, religion, belief, or sexual orientation. The Institute offers a mix of Early Career and more established scientists. Within the project, the applicant has the great opportunity to collaborate and visit collaborators from Zurich, Hamburg, Paris, Woods Hole, and Princeton.

**Intended start date:** September 1<sup>st</sup>, 2023, or to be agreed.

**Duration:** 4 years

**Salary:** The salary is according to the guidelines of the Swiss National Science Foundation and the University of Bern, with funding guaranteed for 4 years.

## How to apply

The application should consist of one pdf-file that includes of a motivation letter, CV, a statement of research experience and interests (max. 2 pages), an academic transcript of your studies, and the names and addresses of at least two references.

Applications can be submitted any time and the position will stay open until filled.

Please send the application and any questions about the position to [jens.terhaar@unibe.ch](mailto:jens.terhaar@unibe.ch).