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**UNIVERSITÄT
BERN**

Bern, 30. April 2021

Physics Institute
**Climate and Environmental
Physics**

The Division of Climate and Environmental Physics, Physics Institute, University of Bern opens a position for a

PostDoc (30 months)

Carbon Isotopes in the Community Earth System Model

A topical research challenge is to quantify the redistribution of anthropogenic CO₂ in the Earth system for informed climate mitigation efforts. The modern decrease in atmospheric ¹³CO₂ and ¹⁴CO₂ is an unequivocal testimony of the input of isotopically-light fossil carbon by human activities. We offer the opportunity to further develop and apply the Community Earth System Model (CESM) to study carbon isotope variations over the industrial period and the next century. This work benefits from a recent spin-up of the coupled isotope-enabled CESM at UBern and collaboration with the CESM isotope community.

The novel combination of isotope-enabled Earth System Models with isotopic data opens a strategic research area with a multitude of interesting applications. For example, spatial gradients and temporal changes in isotopes constrain changes in anthropogenic carbon as well as transport rates from the stratosphere to the ocean bottom. Carbon isotope data are used to identify the imprint of fossil fuel carbon in atmospheric air. Carbon isotopes permit the assessment of changes in water use efficiency, transpiration, and tree phenology on land. Radiocarbon data are used to reconstruct solar activity and isotopic data are key to unravel climate processes on paleo time scales. Despite the multitude of applications, isotope-enabled Earth System Model simulations are largely missing. The plan is to perform simulations with the ¹³C and ¹⁴C-enabled CESM2 over the industrial period and the future to disentangle the influence of different drivers and to compare results with a wide range of observations for model evaluation and improved process understanding.

The research is funded by the Swiss National Science Foundation (SNF) and linked to the Oeschger Centre for Climate Change Research of the University of Bern and two H2020 EU projects. The division has twenty years of experience in running CESM and its predecessors on the Swiss National Supercomputing Facility (CSCS). The salary is according to the guidelines of the SNF. The project duration is initially 30 months. The project start is as soon as possible.

We require a Ph.D. in Physics, Environmental Sciences, or similar disciplines. Experience in numerical modeling, code development, and the ability to fruitfully collaborate with others are essential.

More information can be found on <http://www.climate.unibe.ch> (follow link Research->Research groups->Earth System Modeling: Biogeochemical Cycles) and <http://climatehomes.unibe.ch/~joos/>

Please send your complete application (CV, certificates, grades of courses, letter of motivation, contact details of references) as a single pdf file to Fortunat Joos (fortunat.joos@climate.unibe.ch). A pdf of your Ph.D. thesis is welcome.

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