

CriticalEarth Press Release: Kick-start of a new generation of climate scientists

*The study of critical transitions or tipping points in the Earth system involves increasingly complex mathematical techniques and understanding of the Earth system. **CriticalEarth**, a Marie Skłodowska-Curie Actions - Innovative Training Network programme for young scientists, aims to prepare the next generation of climate scientists for this important task. The training of 15 PhD international students at 17 European research institutions begins this week, with a kick-off meeting in Denmark, hosted by **Critical Earth** partner the University of Copenhagen (Department of Physics of Ice, Climate and Earth at the Niels Bohr Institute).*

Climate tipping is a worrying concept. Abrupt transitions lead to accelerated climate change because the climate system or parts of it move from one stable state to another. Assessing the risk of encountering climate tipping points due to anthropogenic global warming is one of the most urgent challenges in climate science today.

Analyzing a complex system as the Earth's climate to a high enough precision for the prediction of critical transitions involves very different mathematical concepts like stochasticity, chaos theory and dynamical systems theory. The demand for expert understanding of the physical behaviour of the climate system is equally pressing.

The study of tipping points and critical transitions is therefore leading climate science into a field of increasingly advanced mathematics and physics, creating a need for highly-trained specialists. The upstart of the *CriticalEarth* project will hopefully aid this essential task.

CriticalEarth's network of 15 PhD Fellows will be trained in new research methods for assessing the mechanisms and associated risks of critical transitions in the climate.

The focus will be on investigating how complex mathematics can be used to predict and avoid irreversible climate change. The positions will offer the students an excellent experience, working within a strong, cross-disciplinary network among 11 leading Universities and research institutions across Europe, and supported by 8 additional partners in academia, industry, governmental- and non-governmental institutions.

Professor Peter Ditlevsen, who is the leader of the *CriticalEarth* project : *“It is extremely important that we fill the knowledge gap in the mathematical understanding of tipping points and abrupt climate change. This is a deep scientific challenge for the next generation of climate scientists and the reason for the European Commission in investing in the education of 15 excellent young researchers. I am really excited about the project and thrilled to see the development of these great young scientists and the buildup of the international scientific network in CriticalEarth.”*

A Marie Skłodowska-Curie Actions - Innovative Training Network is one of the most prestigious and competitive science programmes under the EU Horizon 2020 which fund *CriticalEarth* with more than 4 million Euros.

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Contributing universities and science institutions.

The Niels Bohr Institute, The University of Copenhagen, Denmark.
Department of Mathematics, Technische Universität München, Germany.
Department of Mathematics, Norges Arktiske Universitet, Norway.
Department of Physics, Utrecht University, The Netherlands.
Department of Mathematics, University of Exeter, Great Britain.
Department of Physics, University of Reading, Great Britain.
Department of Environmental Engineering, Politecnico di Torina, Italy.
Department of Atmospheric Science, Koninklijk Meteorologisch Instituut, The Netherlands.
Laboratoire de physique, ENS de Lyon, France.
Department of Earth Physics and Astrophysics, Universidad Complutense Madrid, Spain.
Institute for Chemistry and Biology of the Marine Environment, Carl von Ossietzky Universität Oldenburg, Germany.

Partner organisations

Department Mathematics and Computer Science, Freie Universität Berlin, Germany.
Université Catholique de Louvain, Belgium
Consiglio Nazionale delle Ricerche, France
Danish Meteorological Institute, Denmark
Potsdam Institute for Climate Impact Research, Germany
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