

The **Environmental Physics Group at the Swiss Federal Institute of Technology Zurich (ETH Zurich)** is a vibrant interdisciplinary team of researchers studying the interaction of biogeochemical cycles and climate from regional to global scales. A new focus of the group is the investigation of extreme events, i.e., conditions in either physical or biogeochemical state that are way outside the norm. We are particularly interested in Eastern Boundary Upwelling Systems, such as the California and Humboldt Current Systems, as we suspect them to be particularly susceptible to such events. In this context, we are searching for

## 3 PhD positions in ocean biogeochemical modeling and data analyses

in the framework of the XEBUS project funded by the Swiss National Science Foundation. The overarching goal of XEBUS is to understand and quantify the extreme events associated with warming, ocean acidification and oxygen loss and their impact on biogeochemistry and lower trophic level ecosystems in the California and Humboldt Current Systems. We will study the past, present and future of extremes using a model-based approach augmented with the analysis and interpretation of in-situ and remote sensing-based observations. The core tool is a high-resolution Regional Earth System Model (R-ESM) consisting of the regional atmospheric model COSMO coupled to the Regional Oceanic Modeling System (ROMS) with an embedded ecosystem/biogeochemical model. The successful Ph.D. candidates will investigate the impact of the extremes, each focusing on a particular subject, i.e., (i) deoxygenation and impacts on the marine nitrogen cycle, especially denitrification and N<sub>2</sub>O production, (ii) the impact of extreme events on marine calcifiers and the air-sea exchange of CO<sub>2</sub>, and (iii) the impact of extreme events on marine phytoplankton and zooplankton and the resulting changes in primary and export production.

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**The ideal candidates** have a master degree in atmospheric, oceanic and/or climate sciences, physics, computational sciences or a closely related discipline. Your English is fluent and you have excellent communication skills. You have experience with a higher programming language (e.g., Fortran, C, Matlab, Python) and a strong interest to work in a highly interdisciplinary Environment.

The PhD students will be supervised jointly by Prof. Nicolas Gruber and either Dr. Meike Vogt or Dr. Matthias Münnich. The three Ph.D. candidates are expected to collaborate closely with each other as each of them will take the lead in one aspect of the overarching project. This team will be joined by a postdoctoral researcher focusing on the development and application of the R-ESM. The starting date of the three positions is staggered over the next 12 months, with the first one expected to start before the summer 2018.

**We look forward** to receiving your online application including a CV, a statement of research interest, and the names of two academic referees until March 15, 2018, but the position stays open until filled.

**For further information** about the position please contact Prof. Nicolas Gruber at [nicolas.gruber\[at\]env.ethz.ch](mailto:nicolas.gruber[at]env.ethz.ch) or visit our website [www.up.ethz.ch](http://www.up.ethz.ch).



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