

L3/M1/M2 Internship

How does large-scale ocean circulation recover from massive carbon release events?

Ocean circulation stabilizes Earth's climate by redistributing heat, carbon, oxygen and nutrients. It provides a buffer for the effects of global warming-induced climate change. On the other hand, massive carbon releases into the atmosphere also alter the strength and patterns of ocean circulation on varying spatial-temporal scales. As such, the long-term relationship between ocean circulation and climate remains poorly understood.

Here, we are interested in the recovery of global ocean circulation following massive carbon perturbations on timescales of 10^3 - 10^4 years using the Earth system model of intermediate complexity cGENIE. The project is open-ended, focusing on one of the following aspects: 1) the role of paleogeography; how would ocean circulation behave under continental configurations vastly different from that of today? 2) the initial climatic state, e.g. greenhouse vs icehouse conditions; and finally, 3) how do the magnitude and rate of carbon emissions affect the response and eventual recovery of ocean circulation? The lessons taken from this exploratory study will improve our understanding of global climatic perturbations of our geological past and permit placing ongoing perturbations into a broader context.

The intern will be able to refine the research scope based on their interests and time constraint. They will be trained to design and perform cGENIE simulations, the results of which they will then analyze and discuss vis-à-vis literature. The internship will take place at *Université Bourgogne Europe* in Dijon (*laboratoire Biogéosciences*), and will be supervised by Jingke LIN (PhD student; jingke.lin@u-bourgogne.fr) and Alexandre POHL (CNRS researcher; alexandre.pohl@cnrs.fr). It is open to L3, M1 and M2 students and a monthly stipend of ~600€ will be provided to contribute towards living expenses.

The working language will be English, and the intern should be comfortable in at least one programming language. Prior knowledge but curiosity in (paleo)climates is not essential, and we encourage applicants from cross-disciplinary and/or underrepresented backgrounds.