PhD position at the University of Geneva
granted by the Swiss National Science Foundation (SNSF)

Are you interested in climate dynamics, nonlinear systems, computer simulations?
Would you like to help advance our understanding of Earth's climate evolution and develop new methods in collaboration with experts in the field? Are you quick to learn, proactive and with computational skills? **If so, this PhD position is for you!**

In the framework of an SNSF–COST project, and in collaboration with the Institute for Environmental Sciences (ISE) at the University of Geneva and the Universitat Politècnica de Catalunya in Barcelona, the Group of Applied Physics (GAP) at the University of Geneva invites applications for a PhD studentship as part of an exciting new research project entitled:

NET4TIP: Network Approaches to Climate Tipping Mechanisms

Tipping elements in the climate system—such as ocean circulation, the Amazon rainforest, or ice sheets—can trigger abrupt shifts in temperature and precipitation patterns when the carbon cycle is sufficiently perturbed. We will use complex networks to represent interactions within the climate system and to study its behaviour during tipping phases. Simulation outputs will guide the application of network approaches to satellite data. We expect this project to open new perspectives for understanding tipping behaviour in the climate system, leveraging the crucial interplay between topological network structures and dynamics, which we also plan to investigate using AI-based pattern recognition algorithms.

In this project, the PhD student will:
1. **Run the MIT General Circulation Model (MITgcm)** together with additional models for continental ice and vegetation components under increasing atmospheric CO_2 concentrations.
2. **Perform climate simulations** exhibiting tipping behaviour of one or multiple tipping elements on multi-millennial time scales.
3. **Test different types of climate-network constructions and indicators**, using available packages such as pyUnicorn and XGI, in order to identify the approach best suited as an Early Warning Signal (EWS) for a given tipping element.
4. **Develop operational EWS workflows** by applying the network approach to satellite data.

We are therefore looking for a highly motivated, independent person who is keen to develop new techniques in nonlinear physics, computer science, and statistics at the interface of climate physics, Earth sciences, and environmental change. We offer outstanding working conditions in Geneva. The student will be co-supervised by Dr Maura Brunetti and Dr Gregory Giuliani (both in Geneva) and Prof. Cristina Masoller (in Barcelona).

The PhD position is fully funded for 4 years (based on a positive evaluation after the first year), starting on **June 1st, 2026** or as soon as a suitable candidate is selected.
Applicants are required to have completed (by the start date of the PhD) a Master's degree—or equivalent—in a relevant field such as physics, climate physics, geophysics or environmental science. Familiarity with climate modelling is an advantage. Programming skills (in MATLAB or Python) are considered a strong asset. Applicants should also have a very good level of written and spoken English, with knowledge of French considered a plus.
To apply, please send your curriculum vitae, a motivation letter, your academic transcripts, and the contact details of two referees in a single PDF document to Dr Maura Brunetti at maura.brunetti@unige.ch by **January 4th, 2026,** together with the master thesis if available. Interviews will take place via Zoom or in person in January-February. We will receive applications until a suitable candidate is found.