

Modelling Alpine hydrology under climate change

The International Masters Program *Earth System Dynamics and Evolution* funded by the Elite Network of the Bavarian State Ministry of Science and The Arts invites applications for a post-doctoral candidate position (Entgelt-/Bes.Gr. TV-L E13 or A13 100%, up to 5 years) at the Friedrich-Alexander University of Erlangen-Nuremberg (FAU), Germany.

The position will **start 1st October 2026** (fixed start date).

Research: *Investigating changes in Alpine hydrology and their impact on Earth System spheres using a distributed, physically-based hydrological modelling approach*

This project aims to develop novel modelling approaches that integrate hydrological shifts observed in the Alpine hydrosphere with changes in the atmosphere, cryosphere, geosphere, and biosphere. Building upon results from the SEHAG research unit (<https://sehag.ku.de/en/welcome/>), we will investigate evidence of the coupled and intertwined responses of Alpine geosystems to climate change. Since the uncertainties inherent in cascaded modelling pose significant challenges for interdisciplinary integration, we will apply advanced model reduction techniques and surrogate models to accelerate Bayesian parameter inference, enabling the identification of key transitions within Earth systems, specifically focusing on Alpine catchments.

Teaching: The candidate will be responsible for supporting training in hydrological and hydrogeological modelling, water quality, and the development of a new module in Soil Science focusing on the critical zone. The candidate will teach up to 5 SWS (Semesterwochenstunden), approximately 3-4 contact hours per week during the semester. Candidates will also contribute, in line with career stage and interests, to broader program activities, including student admissions, shared infrastructure initiatives, and networking events.

Required skills:

- PhD in Geology, Physics, Civil or Environmental Engineering, Applied Mathematics or a related field
- Programming skills (Python, Matlab or similar)
- Experience with distributed and physically based hydrological models
- Interest in Physics-Informed Machine Learning
- Experience with high performance computing

- Willingness establish a research group focusing on alpine hydrology and to pursue a habilitation
- Affinity for interdisciplinary research questions
- Interest for understanding Earth System processes and their complex interactions
- Demonstrated capacity for independent research
- Willingness to conduct independent research and pursue a habilitation
- Good reporting and presentation skills
- Excellent level of written and spoken English
- Ability to work independently, to critically assess own results, and to cooperate within a wider research team across disciplines

Desired or advantageous skills are:

- Background in geomechanics or geotechnics
- Experience in planning and conducting fieldwork in high-alpine environments

The position is part of the International Master Program Earth System Dynamics and Evolution (6 core funded post docs). Active participation and interaction in the joint research seminars, workshops and annual research retreats is required. Proficiency in German is advantageous but not required, as the working language is English. However, we strongly recommend learning German for daily life (funds for German language classes are available). The candidate will be affiliated with the FAU Professorship for Applied Geology and Modelling of Environmental Systems, which offers a vivid working environment with a specific research focus on flow and transport processes at multiple spatial and temporal scales.

Application guidelines

For your application, please send a single PDF to es-master@fau.de. The subject of the email should refer to the individual project/position you are applying for.

For **post docs**, the PDF should comprise:

- Cover letter (indicating which project/position you are applying for, and stating your background and motivation for the project) (max. 1 page)
- CV, including a list of relevant publications (max. 3 pages)
- A short research and teaching concept (max. 2 pages)
- University degree certificates
- Contact details for two potential references

Deadline for applications: 09.04.26.

For further information on this sub-project contact: Prof. Dr. Gabriele Chiogna, Professorship for Applied Geology and Modelling of Environmental Systems, FAU, phone: +49 9131 85-23042, e-mail: gabriele.chiogna@fau.de.