



**University of
Zurich** ^{UZH}

PhD position in Geomorphology (100%)

on

Reconstructing and analysing the past evolution of rock glaciers in Switzerland

within the project RoDynAlpS:

Rock glacier dynamics in the Swiss Alps: evolution and drivers at multiple spatio-temporal scales

Project context

With the support of the Swiss National Science Foundation (SNSF), the Universities of Fribourg (UniFr), Lausanne (UNIL) and Zurich (UZH), and the WSL Institute for Snow and Avalanche Research (SLF) in Davos have launched the RoDynAlpS project, the first comprehensive and consistent study of past, present and regional evolution of rock glaciers in Switzerland. Through the combination of local and region-wide remote sensing analyses, integrative field-based studies and detailed numerical modelling, the project will provide a complete framework for understanding the dynamics of rock glaciers in the context of climate change.

Read more about the project : [RoDynAlpS](#)

Job description

Rock glaciers are amongst the most emblematic permafrost-related landforms of the mountain cryosphere. These ice-rich landforms are substantially affected by climate change and can accelerate dramatically when permafrost temperatures and water contents rise. At present, the state of rock glaciers in the Swiss Alps is largely unknown. In particular, the understanding of current and past rock glacier dynamics remains limited, together with the factors controlling both rock glacier characteristics and creep rates. Decadal changes in rock glacier velocities that occurred during the last century in the (Swiss) Alps are documented only by a few time series. A representative overview of long-term evolution of rock glacier kinematics is lacking, although related data (repeated aerial photographs) are available for the Swiss Alps since the 1950s.

In this project, a systematic computation of long-term series of rock glacier kinematics (horizontal velocities and vertical changes) will be compiled for a large number of sites located in various topo-climatic settings. This data is used to precisely and reliably describe and evaluate velocity patterns over the last decades. The long-term evolution will be compared to the current behavior of rock glaciers as derived from in-situ data and will further be used to develop and calibrate models simulating long-term changes in ice-rich alpine permafrost, both for the past and the future. In addition, attention will be given to so-called destabilized rock glaciers showing anomalous behavior.

The success of the RoDynAlps project and the single sub-projects relies on the close collaboration with the other researchers involved. Thus collaborative tasks, such as publications, events, fieldwork, are planned.

Qualification requirements



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We are looking for a motivated, independent and committed person with a solid background in geomorphology and remote sensing fulfilling the following requirements:

- Master degree in physical geography, earth sciences, remote sensing or closely related discipline.
- Excellent skills in GIS and statistics and willingness to learn programming and photogrammetry softwares.
- Excellent written and oral communication skills in English. German language skills are an asset.
- Work experience in high-mountain terrain is beneficial.

We offer

We offer a 3-year PhD full position (with the possibility to extend for another year). The successful applicant will join the Glaciology and Geomorphodynamics Group (3G) at the Department of Geography at the University of Zurich, Switzerland. The group engages in research of the cryosphere and related processes and impacts in the context of climate change. At our department, all PhD candidates pursue their doctorate within the [Zurich Graduate School in Geography and Earth System Science](#), which provides insights across the breadth of Geography, contact to peers and opportunities to gain additional skills.

How to apply

Applications, including motivation letter, curriculum vitae, University degrees and certifications, and the names and contact details of 2-3 potential references, must be send by e-mail in a single pdf-file to Dr. Isabelle Gärtner-Roer (isabelle.roer@geo.uzh.ch) no later than April 10.

For any question relative to the position and the application process, please contact Isabelle.roer@geo.uzh.ch.