



PhD position at the University of Innsbruck, Quaternary Research Group: Dating of rock slope failures and rock scarps using novel and classical optical dating techniques

The University of Innsbruck (Uibk) is a striving research and teaching institution in the heart of the Eastern European Alps with a strong research focus on alpine environments and processes. As part of the Uibk's doctoral program *Natural Hazards in Mountain Regions*, we seek a PhD candidate to investigate rock fall and gravitational slope deformation processes in alpine contexts using optically stimulated luminescence (OSL) dating techniques. OSL research will be conducted at the Department of Geology, Quaternary Research Group (<http://quaternary.uibk.ac.at>) via the in-house luminescence laboratory and in collaboration with the Center for Nuclear Technologies, Technical U. Denmark (DTU), Risø Campus. The PhD candidate will be embedded into the multidisciplinary framework of the doctoral program and the Uibk alpine research focus and thus be exposed to the fields of geochronology, geomorphology, geology, remote sensing and the geotechnical sciences.

Duration: 3 years

Start: Summer 2018

Review of the applications will start April 7st and close May 19th 2018. The call is open until the position is filled. Applications include (i) a cover letter outlining experience and expertise relevant to the project, (ii) a complete CV including a list of publications, and (iii) at least one letter of recommendation. Uibk strives to increase the female proportion of employees and thus explicitly invites qualified women to apply. Applications should be uploaded onto the career portal of the Uibk: https://orawww.uibk.ac.at/public/karriereportal.details?asg_id_in=9887. Further information can be obtained from Univ. Ass. Prof. Dr. Michael Meyer (michael.meyer@uibk.ac.at)

Executive Summary of the project:

This PhD project is aiming at further developing and applying a set of classical and novel optical dating (OSL) techniques to rock fall sites and deep-seated gravitational slope deformations in alpine contexts. The project will exploit the extended and novel methodological capabilities of OSL *rock surface exposure* and *rock surface burial* dating in combination with OSL *sediment burial dating*. This will allow the emplacement history of rock fall boulders and the timing of rock fall events to be accurately constrained and also provides critical new insights into the timing and kinematic behaviour of deep-seated gravitational slope deformations (e.g. via applying OSL rock surface exposure dating to crystalline head scarps). The data will also fill a gap in the alpine landslide database that is – over geological time-scales – heavily biased towards high-magnitude low-frequency events. Forging these individual dating approaches into a coherent dating strategy and applying it to alpine mass wasting events is a novel endeavour that – in its current format – has never been attempted before. This PhD research is firmly embedded into one of four alpine doctoral

programs and will provide directly relevant data for downstream infrastructure and critical input data for modelling cascade natural hazard processes and for mitigating natural hazard impacts.

Required qualifications:

- University degree (master or diploma) in geosciences, physics or related technical fields
- Substantial experience in OSL research (theoretical and hands-on) are of advantage
- Sedimentological and geomorphological knowledge and mapping/logging skills desirable
- Vital interest and enthusiasm in developing and improving instruments, protocols and sample preparation techniques
- Skills in mathematical-physical and statistical data evaluation
- Capable to conduct field work in high alpine settings (ev. climbing and abseiling experiences)
- Very good English language skills (oral & written)
- Enthusiasm to work independently in an international and multidisciplinary team

Tasks:

- OSL sampling, sample preparation, measurements, data processing and interpretation
- Geomorphological mapping and sedimentological logging of sampling sites and trenches
- Developing and testing sample preparation and measurement approaches for OSL surface exposure dating
- Participation in the research and training activities of the doctoral program *Natural Hazards in Mountain Regions*
- Publication and presentation of results at conferences and in international journals
- Contribution to teaching activities (optional)