UNIVERSITÄT BERN

Institut für Geologie

Institut für Geologie, Baltzerstrasse 1+3, CH-3012 Bern

Two PhD Positions in Structural Geology/Rock Mechanics

The Institute of Geological Sciences (University of Bern, Switzerland) invites applications for two SNF-funded PhD positions, which are embedded in the project ‚**Deformation of Fine-Grained Granitoid Fault Rocks: Microstructures, Deformation Processes & Rheology**'. Current research suggests that deformation in the granitoid continental crust strongly localizes in fault zones, consisting of ultrafine-grained polymineralic fault rocks. The microstructural evolution and rheology of such material is very poorly known. The PhD projects will investigate this topic by combining studies of naturally deformed rocks, rock deformation experiments and rigorous quantitative microstructural analysis (SEM, EBSD, CL-imaging, TEM, EMPA, FTIR spectrometry and digital image analysis). Research questions to be addressed are (1) the rheology of polyphase, ultrafine-grained granitoid fault rocks in experiments; (2) the effect of fluids (pore pressure, mass transfer/healing processes), and (3) continuous versus discontinuous deformation and related cyclical changes in strain rate (interseismic-seismic). The research will by carried out collaboratively by an inter-disciplinary and multi–university team (Universities of Bern, Tromsø/Orleans, Utrecht and ETHZ). The two PhD students will be hosted at Bern, but each of them will spend several weeks per year at the partner facilities abroad.

PhD position 1
Investigates upper crustal deformation and associated dominantly frictional deformation (brittle to semibrittle). The study includes fieldwork, experiments of non-cohesive gouge material (conducted in the hydrothermal ring shear apparatus at variable physical conditions at Utrecht University; supervision by Profs. A. Niemeijer and C. Spiers), and detailed microstructural work (at Berne and ETH-Zurich).

PhD position 2
Investigates the intermediate to higher temperature (frictional to viscous) deformation of granitoid ultramylonites by studying them in nature and experiment. For the latter, Griggs Rig experiments are conducted at different physical conditions at Orleans University (supervision by Prof. H. Stünitz), in conjunction with detailed microstructural work at Berne and ETH-Zurich.

We seek excellent and highly motivated candidates interested in combining studies in nature and experiment. The Institute of Geological Sciences of University of Bern provides a stimulating research atmosphere with the possibility to interact between a variety of research teams. The ideal date for the start of the projects will be August 1st 2020. The project is funded for a maximum duration of four years. Required is a MSc in Earth Sciences or an equivalent degree. Applications should include a cover letter with a statement of research interests and motivation to undertake a PhD (be specific with respect to position 1 or 2), a CV, transcripts of academic degrees as well as names and addresses of two references. The application should be sent electronically as **single PDF file** to Prof. **Marco Herwegh (herwegh@geo.unibe.ch)**. Applications will be accepted until the position is filled. For further information please contact Marco Herwegh by mail.

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