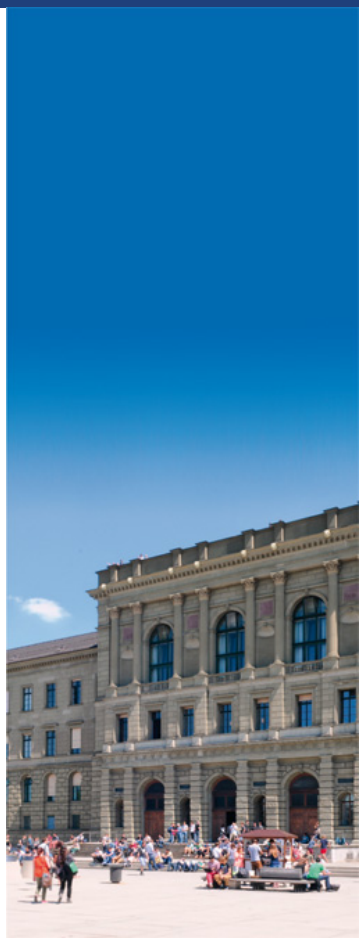
ETH zürich

ETH Zurich's **Department of Earth Sciences** is one of the world's top-ranked geoscience institutions. It is renowned for its excellent education, cutting-edge fundamental research and large-scale geoscience experiments in deep underground laboratories.



PhD position: Fracture growth in anisotropic rocks

We are searching for a PhD student to numerically model fracture growth in anisotropic rocks under thermo-hydro-mechanical (THM) loading. The topic has direct application in engineering geothermal systems and is of high relevance to many other facets of fundamental and applied geosciences. The project is part of the broader Swiss Competence Center for Energy Research initiative and will link to pilot projects in the Swiss deep underground laboratories at Mont Terri, Grimsel and Bedretto. The modeling will address an outstanding question in geomechanics: how does rock anisotropy impact the fracture propagation path under in-situ condition? The PhD student will develop and apply computational methods (finite element/finite volume) to study the systematics of fracture propagation in anisotropic rocks and to quantify the physics that controls it. You will use our extensive data on laboratory and field experiments to validate the results of the numerical code and will engage in the interpretation of in situ field experiments that study how fracture networks can be engineered for geothermal applications and how earthquakes are generated on these fractures.

We are looking for a highly motivated candidate with a Master's degree (or equivalent) in mechanical or civil engineering, geosciences or a related subject. A strong interest in developing and using numerical modeling to solve real-world problems is key to success. Background in continuum mechanics, knowledge of rock and fracture mechanics, sound programming skills with C++, experience in code development and finite element analysis are desirable but not an exclusive pre-requisite. Excellent verbal and written communication skills in English are required. You will be involved in co-supervising Master's projects and assisting teaching of departmental courses.

We look forward to receiving your online application including the following documents: full CV with contact details of two referees included, academic transcripts, a two-page statement of purpose, and a copy of journal publications if available. Please note that we exclusively accept applications submitted through our online application portal. Applications via email or postal services will not be considered. The application review will begin on March 1st, 2019 and continue until the position is filled. The desired latest start date is June 1st, 2019.

For further information about the department and the competence center please visit our websites: www.erdw.ethz.ch and www.sccer-soe.ch. Questions regarding the position should be directed to Prof. Thomas Driesner by email thomas.driesner@ethz.ch (no applications) and Dr. Morteza Nejati by email mnejati@ethz.ch (no applications).

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