

MSc Thesis Project in Engineering Geology

Topic:

Fracture Patterns and Fracture Genesis in the Grimsel Pass Area

Project Framework:

Fractures are key structures in crystalline rock masses when dealing with slope and excavation stability, groundwater or geothermal resources. For example, Nagra (the Swiss Cooperative for the Disposal of Nuclear Wastes) is interested in the fractures properties within the external crystalline massifs of the Swiss Alps because they control fluid flow and radionuclide release. Or KWO (Kraftwerke Oberhasli AG) are interested in fracture patterns in the Aar Massif because they would like to evaluate with us the potential of renewable geothermal energy in their business area. Understand the formation of fractures helps generating reliable 3D models of fracture patterns, which include statistical data about fracture sizes, spacings, orientations, and fracture surface properties.

MSc Thesis Project Goals and Approach:

In this project we would like to deepen our understanding on the properties and genesis of fractures in the Grimsel Pass area. The Grimsel Pass area is selected for various reasons, one being that this area is suitable for detailed surface mapping and offers the chance to combine data from surface mapping with observations made in underground excavations from KWO. Another reason for selecting this area is the occurrence of famous large unloading fractures that, that will be a key element of the entire fracture pattern. Mapping will include also bedrock (Aar Granite) fabrics and ductile fault zones.

MSc Thesis Project Supervisors:

Prof. Simon Löw

Dr. Keith Evans