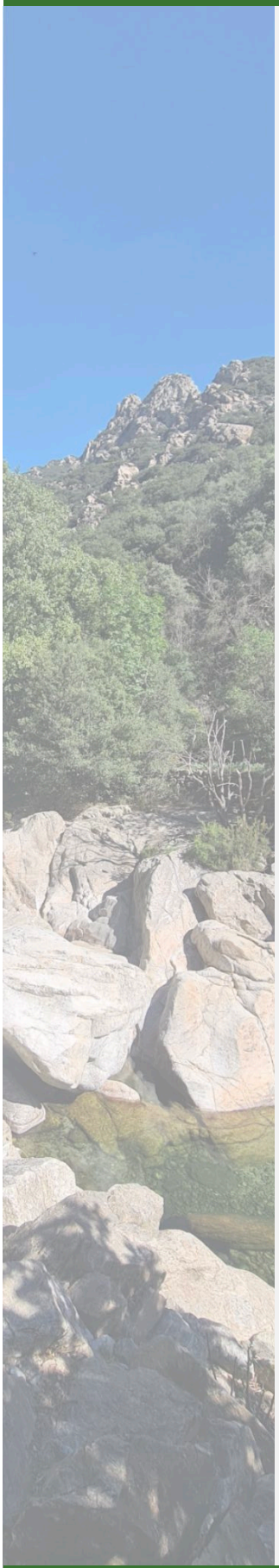
Institut für GEOWISSENSCHAFTEN und GEOGRAPHIE
Martin-Luther-Universität Halle-Wittenberg

MARTIN-LUTHER-UNIVERSITÄT
HALLE-WITTENBERG

Geowissenschaftliche Kolloquien WiSe 2026/2027

Dienstag 10.11.2026 16.15 Uhr



Frau Prof. Dr Katja Emmerich & Herr Dr. Ali Asaad

Abteilung V Natürliche Baustoffe und angewandte Tonmineralogie - Labor für Tonmineralogie

The Sandwich shaft sealing experiment at Mont Terri Rock Laboratory – Selected aspects of clay science

Shaft and drift seals are part of the engineered barrier system of geological repositories for high-level radioactive waste. Thereby the Sandwich sealing system, that was developed at KIT, acts as a hydraulic sealing in seals. It consists of sealings segments (DS) sandwiched by equipotential segments (ES). DS are built of a binary mixture of bentonite pillows and bentonite granular material (BGM). The ES are characterized by a higher hydraulic conductivity than the DS and preferential flow paths of fluid during hydration are interrupted in ES. Fluid is evenly distributed over the cross section of the seal in the ES and available for hydration of adjacent DS resulting in homogenous hydration, swelling and sealing.
The international Sandwich project investigates the behaviour of the Sandwich sealing system by experiments on multiple scales and numerical hydro-mechanical(-chemical) simulations Experiments range from swelling pressure measurements and MiniSandwich experiments to semi-technical scale tests and a large-scale experiment, that consists of two experimental shafts with Sandwich sealing systems installed in each, has been conducted at the Mont Terri rock laboratory (MTRL) since July 2019.
The presentation is particularly related to the laboratory experiments and the structure-functionality-relation of swellable clays that relates fundamental smectite and bentonite properties to the hydration and swelling of DS.





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