



Program of the 2nd GeoLaB Scientific Workshop

12.03.2026

08:30 - 09:00: Registration (NTI-Hörsaal, Building 30.10, KIT Campus Süd, Engesserstraße 5)

09:00 - 09:20: **Thomas Kohl**: 5 Min Welcome talk + GeoLaB in the international scientific context

09:20 - 09:55: **Eva Schill** Keynote: *Tackling Critical Challenges in EGS Development Through Underground Research Laboratories*

09:55 - 10:30: **Marian Hertrich** Keynote: *BedrettoLab - from an abandoned tunnel to an underground research infrastructure*

10:30 - 11:00 Coffee break

URL exploration (chaired by **Florian Wagner**):

- 11:00 - 11:15: **Ingo Sass**: GeoLaB: Overview and research strategy
- 11:15 - 11:30: **Jens Grimmer**: Structural and geological constraints on the subsurface geology of the Tromm area
- 11:30 - 11:45: **Amr Talaat Tolba**: Imaging Granite–Metamorphic Unconformities and Structural Variability Using PSDM Seismic and Borehole Data: Implications from the Tromm Area, Germany
- 11:45 - 12:00: **Simona Pierdominici**: Overview of Downhole Logging measurements for GeoLaB drilling Project
- 12:00 - 12:15: **Fiorenza Deon**: GLB1 well: can a comparison between mineralogic and downhole logging investigation play a role on the GeoLaB construction plan?
- 12:15 - 12:30: **Andrea Balza Morales**: Integrated structure-based inversion of geophysical data for improved site characterization
- 12:30 - 12:45: **Pritam Yogeshwar**: DESMEX - Semi-airborne electromagnetic exploration with UAV-towed magnetometers

12:45 - 13:45 Lunch break

13:45 - 15:00 Poster session

15:00 - 15:15: Coffee break

Experiment design (chaired by **Harald Milsch**)

15:15 - 15:50 **Reza Jalali** Keynote: *From Characterization to Circulation: Lessons learned from in-situ stimulation experiments*

- 15:50 - 16:15: **Jean Schmittbuhl**: Mechanical Stiffness and Permeability of a Reservoir-Scale Rough Fracture During Closure
- 16:15 - 16:30: **Kai Li**: Shear Behavior of Natural Granite Joints from the GeoLaB Exploration Well: Implications for Underground Geothermal Research Laboratories
- 16:30 - 16:45: **Andres Alcolea**: Hydraulic Characterization of a multi-stage Enhanced Geothermal System: A Workflow Integrating Pre- and Post-Stimulation Tests with Real-Time Microseismic Monitoring at the Bedretto Underground Laboratory (Switzerland)
- 16:45 - 17:00: **Harald Milsch**: Improvement and long-term sustainability of fracture permeability in crystalline basement rock

18:00 - 22:00 Workshop dinner at **Lehners Wirtshaus** (Karlstraße 21a, 76133 Karlsruhe)

13.03.2026

EGS/Fracturing acceptability (chaired by **Thomas Kohl**)

09:00 - 09:35 **Fabian Uth** Keynote: Geothermal Energy as a Strategic Domestic Resource for Germany and the Enabling Role of Enhanced Geothermal Systems (EGS)

- 09:35 - 09:50: **Nora Medgyesi**: A Roadmap for horizontal multistage EGS heating projects in Germany: assessing deployment potential and limiting factors
- 09:50 - 10:05: **Alessa Auerswald**: Why Multi-Level Communication matters for the GeoLaB project?
- 10:05 - 10:20: **Saeed Mahmoodpour**: Thermo-Hydraulic Modelling of Heat Extraction in Enhanced Geothermal Systems with Temperature-Sensitive Proppants
- 10:20 - 10:35: **Davood Yazdani**: A Hydromechanical Phase-Field Model for Predicting Hydraulic Fracturing in Brittle Rocks
- 10:35 - 10:50: **Keita Yoshioka**: Hydraulic Fracturing by Supercritical CO₂ Injection in the Presence of Rock Microstructure

10:50 - 11:15 Coffee break

GeoDT (chaired by **Olaf Kolditz**):

- 11:15 - 11:20: **Olaf Kolditz** General introduction
- 11:20 - 11:35: **Jian Yang**: A Workflow for Integrating GIS Data into Implicit Geological Models within a Digital Twin Framework
- 11:35 - 11:50: **Edinsson Muñoz-Vega**: Hydro(geo)logical monitoring and integrated hydrological modelling of groundwater systems at the GeoLaB Tromm site
- 11:50 - 12:05: **Yuxiao Wang**: Process Model Development for a Geothermal Digital Twin Framework
- 12:05 - 12:20: **Victor Häfner**: Virtual Boreholes from Downhole Logging Data
- 12:20 - 12:35: **Karsten Rink**: Towards a digital twin of the GeoLaB Tromm site

12:35 - 13:30 Lunch break

Modelling/AI/etc. (chaired by **Ali Dashti**)

- 13:30 - 13:50: **Denise Degen**: Towards Digital Twins: Interpretable Physics-Based AI method for Near Real-Time Predictions
- 13:50 - 14:05: **Saeid Sadeghnejad**: Data-Driven Approaches to Subsurface Characterization with Implications for Geothermal Research
- 14:05 - 14:20: **Rahim Habibi**: Discrete Fracture Network Modeling Based on Borehole Image Log: Case Study of the GeoLaB
- 14:20 - 14:35: **Karsten Reiter**: Towards a robust 3-D stress prediction for the Tromm region
- 14:35 - 14:50: **Rüdiger Giese**: Long-term geophysical monitoring of fault-heating and fluid-injection processes in shale rocks at the Tournemire URL, Southern France

14:50 - 15:00 farewell talk: **Thomas Kohl/Ingo Sass/Olaf Kolditz**

Poster Presentations

- **Stefan Lüth**: The state of seismic exploration of the GeoLaB Tromm site – lessons learned so far
- **Nathan Dutler**: A portfolio of services and developments ranging from applications in shallow to deep geothermal reservoirs extending from science to industry
- **Markus Bleicher**: Structural modelling of the Tromm: Data preparation and integration
- **Haizhen Zhai**: A Three-Dimensional Conceptual Model of the Yangyi Geothermal Reservoir Based on Integrated Data
- **Angel Ramirez**: Thermal and microstructural controls on permeability evolution in the Tromm Granite (Odenwald, Germany): Experimental and microstructural insights
- **Jérôme Azzola**: Monitoring cementation and drilling processes in GeoLaB exploration wells with fiber optic sensing
- **Nadine Haaf**: Geophysical Characterization of Crystalline Rock Using Gravimetry, Magnetics, and DC Resistivity for the GeoLaB Project
- **Juliane Kummerow**: Reactive Flow-Through Experiments Investigating the Evolution of Transport Properties in Conventional and Supercritical EGS

- **Carola Bunes:** Effects of Rough Fracture Opening on Laminar Single-Fracture Flow
- **Gina Rüdiger:** Experimental studies on chemical stimulation through reactive transport processes in Enhanced Geothermal Systems (EGS)
- **Fatemeh Hosseinpour:** A GIS-Based Screening Framework for Geothermal-CRM Co-Production: From Global Data Integration to Site Selection
- **Pritam Yogeshwar:** DESMEX - Evolution of semi-airborne controlled-source electromagnetics for mineral exploration and beyond
- **Akash Kumar:** Sequential Chemo-Mechanical Phase-Field Modeling of Corrosion-Induced Cracking in Geothermal Pipes
- **Fabian Epp:** Phase-Field Modeling of Hydro-Thermal Processes in Geothermal Fractures
- **Taka Kanaya:** Effects of preexisting fractures on earthquake precursory behavior
- **Kamal Ahmadov:** Normal stress pulse during fluid-driven seismicity migration
- **Philipp Herold:** Water-glass-based injection materials for the application in crystalline rock environments
- **Timo Seemann:** The TOUGH Project: Decameter-Scale In-Situ Experiment on THMC-Coupled Processes in Fractured Geothermal Reservoirs at the Grimsel Test Site