UNIVERSITÉ DE GENÈVE

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SÉMINAIRE ÉNERGIE – ENVIRONNEMENT
Conférences 2023 - 2024

Geothermal Fluids as a raw mineral resource: Chances and Challenges for a domestic lithium production

Fabian Nitschke
Karlsruher Institut für Technologie (KIT)

Jeudi 16 novembre à 17h15

Uni Carl Vogt – Salle 1 (rez-de-chaussée)
66 bd Carl-Vogt, 1205 Genève

Conférence en présentiel suivie d'un apéritif

Diffusion en direct avec Zoom : https://unige.zoom.us/j/65489922494
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L’orateur

Dr Fabian Nitschke is a Research Associate in the Department of Geothermal Energy and Reservoir Technology at the Karlsruher Institut für Technologie (KIT), Baden-Württemberg, Germany.

Nitschke's research focus on geothermal energy, geochemical exploration, raw materials in geothermal fluids (geothermal lithium), hydro-geochemical modelling, Machine Learning applications to water chemistry. He is notably also co-author of the study on lithium deposits in the Upper Rhine Graben.

He is currently working on two projects:
- F4aT-Hydrauliklabor (Forced Fracture Fluid Flow and Transport)
- MALEG (Machine Learning for Enhancing Geothermal Energy Production)

La conférence

The energy transition demands vital mineral resources, notably lithium, crucial for high-energy-batteries. While it is primarily sourced from Australian hard rock and South American salars, exploring domestic deep geothermal fluids could serve as an alternative source to counter an anticipated deficit. This approach offers significant geostrategic advantages, with initial studies affirming economic viability. Direct Lithium Extraction (DLE) from geothermal fluids, known for its environmental impact, holds large potentials.

The research on geothermal lithium at KIT covers various aspects. An evaluation of the market situation, the geothermal resources, the currently installed capacities and the technical processes the extraction serve as a basis for an overview of the current state of the technology. An approach is presented which enables to produce a lithium concentrate and to overcome hydrochemical constraints (mineral scaling).

A new tool for exploration purposes was developed which uses AI-methods to assess large hydrochemical datasets. Since knowledge of long-term reservoir behavior as a consequence of lithium extraction is missing, a numerical chemical transport model was set up to investigate the impact of the reinjected lithium depleted brine on the lifetime output.