

Ph.D. student in the MALEG project in
Machine learning techniques to increase efficiency of geothermal energy production

The KIT (Karlsruhe Institute of Technology) is strongly expanding its geothermal program. The division of Geothermal Energy & Reservoir Technology focuses on scientific and technological challenges of using geothermal energy. Projects are often conducted in an international context and expand from the local Upper Rhine Graben up to South America with numerous partners from academia and industry in application fields worldwide.

Job specification

Geochemical processes are of high importance to geothermal production. Often its impact is visible only after several years of operation. Moreover, a geothermal cascade use, covering multiple temperature ranges, and combining district heating, absorption cooling machines, greenhouse use, etc., increases the overall geothermal efficiency but also the geochemical processes can occur over larger P/T ranges. One key challenge is the **enhanced scaling potential** resulting from the lower return temperatures. The target of the upcoming MALEG (Machine Learning for Enhancing Geothermal energy production) project is the design and the optimization of cascade production schemes aiming for the highest possible energy output by still preventing scalings.

The research will be focusing on the **development of a machine learning tool** to quantify the impact of the enhanced cooling on the fluid-mineral equilibrium and to optimize the operations economically. The tool will be based on results from widely-applied deterministic models and experimental data collected at geothermal plants in Germany, Austria and Turkey by our international project partners. Once fully implemented the MALEG-tool will work as a **digital twin of the power plant**, ready to assess and predict scaling formation processes for geothermal production from different geological settings.

In this context, we are searching for a highly motivated scientist with the ability to integrate into our international working group at KIT. This requests advanced English communication as well as basic German language skills. The position is aiming at the development of a machine learning tool and the set-up of deterministic geochemical models. The ideal candidate should hold a master's degree in geosciences or geophysics with sound interest in aqueous geochemistry and experience in numerical modeling.

The position is available from Oct. 1st, 2022. The employment contract is limited to 3 years. The salary is based upon the salary frame agreement for the German public service sector (TV-L West, 75%, entry-level E-13). KIT is pursuing a gender equality policy. We therefore particularly encourage qualified women to apply. If qualified, handicapped applicants will be preferred.

Applications will be considered until **September 30th, 2022** and should contain a letter of application and a CV possibly including a list of publications and a research statement. Please send your application to:

Karlsruhe Institute of Technology (KIT) – Campus South, Prof. Dr. Thomas Kohl, Institute of Applied Geosciences, Division of Geothermal Energy and Reservoir Technology, Adenauerring 20B, 76131 Karlsruhe, Germany, or via email to silke.schlichting@kit.edu

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