PhD Position in Multi-Scale Reactive Transport Modeling in Deep Hydrothermal Reservoirs (m/w/d)

The Hydrogeology workgroup at the University of Tübingen, Germany, invites applications for a PhD position within the research project "**Long-term Behavior of Coupled Reactive Transport Processes in Deep Hydrothermal Reservoirs (LangRes)**". The project is funded by the German Federal Ministry of Research, Technology, and Space (BMFTR) under the topic focus "*Deep geothermal energy*" within the program "*Geoscience for Sustainability (GEO: N)*". The aim of this project is to improve process-based predictive capabilities for geothermal reservoir utilization by integrating experimental observations and multi-scale modeling approaches. The project is conducted in close collaboration with five partner institutions. The PhD candidate will be supervised by Dr. Tao Yuan and co-supervised by Prof. Olaf A. Cirpka.

Responsibilities:

1) Develop a pore-scale Thermal-Hydraulic-Chemical (THC) model for reactive transport in deep hydrothermal reservoirs,
2) Develop and implement an upscaling workflow to parameterize a Darcy-scale THC model based on pore-scale results,
3) Investigate and quantify the influence of geochemical reactions on flow regimes and thermal transport across pore and Darcy scales,
4) Collaborate with project partners for model validations, applications, and predictive studies,
5) Prepare materials for regular project reporting (e.g., kick-off meetings, consortium meetings, progress reports),
6) Publish high-quality articles in peer-reviewed journals in the field,
7) Present research outcomes at national and international conferences.

Basic Qualifications:

1) A completed M.Sc. degree in Hydrogeology, Geosciences, Environmental Engineering, Fluid Mechanics, Applied Mathematics, or a related field
2) Strong proficiency in English
3) Capability to work independently and collaboratively

Preferred Qualifications:

1) Experience with thermal transport simulation, reactive-transport simulation, groundwater flow simulation, and numerical model development
2) Basic knowledge of numerical methods for solving nonlinear systems of partial differential equations (e.g., finite volume method, finite element method)
3) Experience with open-source CFD software such as OpenFOAM, PFLOTRAN, OpenGeosys, and geochemistry software such as PHREEQC

This is a **three-year** fixed-term position with a start date of **May 1st, 2026**. Employment (TV-L E13, 75%) will be arranged by the administration of the University of Tübingen. The university is committed to equal opportunities and diversity. It therefore takes an individual's situation into account and asks for relevant information. People with disabilities will be given preferential consideration if they are equally qualified. The University of Tübingen strives to increase the proportion of women in research and strongly encourages qualified women to apply.

Applicants should submit a single PDF file containing (1) a CV, (2) a motivation letter describing your research interests and reasons for applying, (3) copies of transcripts (BSc and MSc degrees), and (4) names and email addresses of two references. Applications should be sent to Dr. Tao Yuan, tao.yuan@uni-tuebingen.de by **March 25, 2026.**

For further information regarding the position, please contact Dr. Tao Yuan, tao.yuan@uni-tuebingen.de, or Prof. Olaf A. Cirpka, olaf.cirpka@uni-tuebingen.de.