Munich Institute of Integrated Materials, Energy and Process Engineering
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Energy, and Process Engineering
Technische Universität München

The Munich Institute of Integrated Materials, Energy and Process Engineering (MEP) at the Technical University of Munich combines the expertise of over 50 researchers in materials, energy, and process engineering as an Integrative Research Institute. Renewable and sustainable energy systems are one of the main pillars of the research.

The Geothermal Alliance Bavaria (GAB) is a joint research project coordinated by the MEP. The project coordination Team accompanies the interdisciplinary topics of all member institutes and chairs at TUM, as well as project members at the University Erlangen-Nürnberg, Ludwig-Maximilians-University, University Bayreuth & University of Applied Sciences Munich.

We are seeking a new team member as soon as possible for the following position:

Postdoctoral Researcher with a focus on AI and Optimization for Enhanced Geothermal Systems (m/f/d)

[Alternative title: Postdoctoral Researcher with a focus on AI and Optimization in the Geothermal Energy Field (m/f/d)]

in full-time 100% (fixed term until 31.12.2028)

Research topic:

Enhanced Geothermal Systems (EGS) create an engineered reservoir by hydraulically stimulating hot, low-permeability rock, which makes geothermal heat accessible far beyond the few regions with natural hydrothermal reservoirs. The main challenge is to create and maintain a fracture network that delivers enough flow and heat over decades while keeping induced seismicity low. Since design and operating decisions, such as well placement and spacing, stimulation design and flow rates, determine the heat output, the time to thermal breakthrough and the pumping effort, they need to be optimized. The resulting optimization problems are constrained by coupled thermo-hydro-mechanical (THM) processes in fractured rock, which are governed by PDEs, expensive to simulate, and subject to large geological uncertainty. The main goal of this position is to develop a new class of AI-assisted optimization approaches for EGS, for example using neural operators and generative AI models.

Your tasks:

- Work in a team on national collaborative research projects that develop modeling, simulation and optimization methods for geothermal systems
- Develop new AI-based optimization approaches for EGS, from methodology (theory) to implementation (application)
- Develop AI-assisted frameworks for EGS techno-economic tools
- Coordinate the cooperation with the project partners
- Publish results in peer-reviewed journals and present them at international conferences

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Your Qualifications:

- **Degree:** PhD in engineering, applied mathematics, physics or computational science
- Strong analytical skills and interest in developing new simulation and optimization methods
- Good knowledge of mathematical/numerical optimization methods or deep learning methods is a plus
- Enthusiasm for challenging mathematical problems and interdisciplinary collaboration
- Programming experience (preferably Python)
- **Languages:** Excellent written and spoken English, good command of German is preferred
- **Experience:** Experience in writing research funding proposals is preferred
- **Soft-Skills:** self-responsibility, collaborative skills, strategic and interdisciplinary thinking

Our offer

- An exciting interdisciplinary research environment at one of Europe's leading universities
- Applied research on a highly relevant topic of the German energy transition
- Opportunities for scientific networking, professional development, and international collaboration
- A motivating, interdisciplinary team with an excellent network in research and industry
- A broad offer of training and courses in science and project management, languages, and sports
- Flexible working hours & options for working from home

This is a fixed-term appointment until 31.12.2028. Salary is in accordance with the German State Regulated Public Salary Scale (TV-L E13 100%). As part of the Excellence Initiative of the German federal and state governments, TUM has been pursuing the strategic goal of substantially increasing the diversity of its staff. As an equal opportunity and affirmative action employer, TUM explicitly encourages nominations of and applications from women as well as from all others who would bring additional diversity dimensions to the university's research and teaching strategies. Preference will be given to disabled candidates with essentially the same qualifications.

Your Workplace:
Technical University of Munich, Munich Institute of Integrated Materials, Energy and Process Engineering (MEP), Lichtenbergstr. 4a, 85748 Garching

Final deadline:
08.11.2026

Please submit your electronic application (motivational letter, CV, copies of your diplomas, and list of publications) in a single PDF to:
nora.medgyesi@tum.de

Data protection information:
As part of your application for a position at the Technical University of Munich (TUM), you will be transmitting personal data. Please refer to our privacy policy in accordance with Art. 13 General Data Protection Regulation (GDPR) regarding the collection and processing of personal data in the context of your application process:
https://portal.mytum.de/kompass/datenschutz/Bewerbung/
By submitting your application, you confirm that you have taken note of TUM's privacy policy.