

University of Stuttgart

Doctoral Position in Multiphase Flow and Interfacial Phenomena in Porous Media

Project Z02 – Collaborative Research Centre SFB 1313 , University of Stuttgart, Germany

The **Institute of Applied Mechanics (MIB)** at the University of Stuttgart invites applications for a fully funded PhD position within **Project Z02** of the Collaborative Research Centre **SFB 1313: “Interface-Driven Multi-Field Processes in Porous Media – Flow, Transport and Deformation.”**

The successful candidate will join an interdisciplinary research environment investigating fundamental physical processes governed by interfaces in porous media systems.

Research Topic

Understanding how interfaces control flow and transport in porous materials is central to many natural and technological processes, including energy systems, geosciences, and environmental applications.

Within Project Z02, the doctoral researcher will study multiphase flow processes involving interfacial effects and phase transitions at the pore scale.

The project combines fundamental physical modelling with advanced microfluidic experiments at the **Porous Media Lab (PML)** (<https://www.mib.uni-stuttgart.de/pml/>) to investigate the mechanisms governing:

- interfacial transport phenomena.
- capillary-driven multiphase flow.
- evaporation and salt precipitation / dissolution.
- pore-scale flow dynamics.

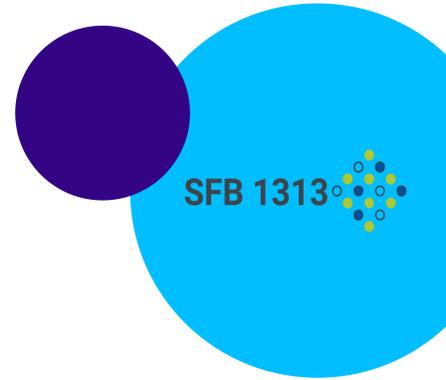
Microfluidics will be used to visualize and quantify interfacial dynamics and transport processes under well-controlled conditions. The research integrates experimental investigations, physical modelling, and mathematical analysis to provide new insights into interface-driven transport in porous media.

The PML at the University of Stuttgart will provide state-of-the-art microfluidic fabrication, high-speed imaging, and pore-scale flow measurement techniques.

Your Profile

We are looking for highly motivated candidates with:

- A Master’s degree (or equivalent) in Mechanical Engineering, Physics, Civil Engineering, Chemical Engineering, or a related field.
- Strong background in multiphase flow and transport in porous media.
- A solid physical understanding of fluid mechanics and interfacial phenomena.
- Interest in fundamental research combining experiments and modelling.
- Experience with microfluidics, experimental fluid mechanics, or pore-scale modelling is advantageous.
- Strong analytical skills and curiosity for interdisciplinary research.
- Excellent English communication skills.



Research Environment

The position is embedded in the **Collaborative Research Centre SFB 1313** (<https://www.sfb1313.uni-stuttgart.de/>), a large interdisciplinary research program funded by the **German Research Foundation (DFG)**. The SFB1313 brings together researchers from mechanics, physics, geosciences, and engineering to investigate interface-driven processes in porous media across multiple scales.

The candidate will work within an international and highly collaborative research environment with access to advanced experimental infrastructure, including:

- microfluidic device fabrication
- high-speed imaging and microscopy
- pore-scale flow measurement techniques
- specialized facilities for porous media research

Employment

Fully funded **PhD position (TV-L E13)**

Start date: **as soon as possible**

The University of Stuttgart is an equal opportunity employer and strongly encourages applications from international candidates and underrepresented groups.

Application

The application deadline is 15 April 2026.

Applicants should submit a single PDF file containing:

- Motivation letter
- Curriculum vitae
- Academic transcripts and certificates
- Contact details of two academic referees

Applications should be sent via email to:

Dr. Nikolaos Karadimitriou

Institute of Applied Mechanics (MIB)

University of Stuttgart

 nikos.karadimitriou@mechbau.uni-stuttgart.de

The doctoral research will be conducted under the supervision of **Prof. Dr.-Ing. Holger Steeb** and **Dr. Nikolaos Karadimitriou** at the Institute of Applied Mechanics, University of Stuttgart.

