CFD simulation (RANS and/or LES) of a liquid metal flow for concentrated solar-, nuclear- and fusion power plants applications

General information about liquid metal research activities at KIT:

KIT has a long tradition in basic and applied research on the liquid metal field (both experimental and simulation). For more information, please visit: http://limcka.forschung.kit.edu/index.php

Particular information regarding the master thesis:

A liquid metal facility (DITEFA 2: https://www.inr.kit.edu/english/702.php) is currently being commissioned. The experiment is planned to be performed during the summer semester 2020. Within this project, CFD simulations are needed for further development of the instrumentation and for other purposes.

The **objectives of the master thesis** are

- To run RANS/LES simulations of a liquid metal flow in a simple geometry based on the DITEFA facility (see figure on the right)
- LES
    - To improve existing LES-cases
    - To improve an existing computational mesh and then adapt an existing LES-case setup based on the boundary conditions given by the experiment
- RANS
    - To run a RANS simulation with different momentum and heat transfer models and make a sensitivity analysis
- To write a master thesis and present the results in an oral presentation

When working at INR in Campus North **you may expect**:

- A personalized supervision from beginning to end of your thesis
- A friendly and international working atmosphere in one of the most prestigious research institutes in the liquid metal field in Germany and Europe
- To gain deeper insight into fluid mechanics, heat transfer, numerical analysis, basic turbulence concepts and RANS- and/or LES-turbulence modeling

Further information
Duration: 6 Months
Requirements: Basic knowledge in fluid mechanics of turbulent flows
Beneficial skills: A first experience with CFD simulation tools (ANSYS Fluent/CFX and/or OpenFOAM)
Starting Date: immediately
Contact person and supervisor: Thomas Schaub (thomas.schaub@kit.edu)
Faculty supervisor: Prof. Dr.-Ing. Robert Stieglitz (MACH)

Students from other faculties are encouraged to send applications as well!