



Karlsruhe Institute of Technology

Karlsruhe Institute of Technology
Personalservice (PSE)

Kaiserstraße 12
76131 Karlsruhe

<http://www.pse.kit.edu>

Karlsruhe Institute of Technology (KIT) – The Research University in the Helmholtz Association creates and imparts knowledge for the society and the environment. It is our goal to make significant contributions to mastering the global challenges of mankind in the fields of energy, mobility, and information. For this, over 9800 employees of KIT cooperate in a broad range of disciplines in research, academic education, and innovation.

We are looking for a

PhD Student/ Research Assistant (f/m/d)
Model predictive control (MPC) for flow batteries

Organizational unit	Institut für Mechanical Process Engineering and Mechanics (MVM), Campus South
Job description	In previous projects a framework for the simulation-based screening of electroactive materials for aqueous and nonaqueous organic redox flow batteries (RFBs) have been developed. It adopted a multiscale modelling paradigm, in which simulation methods at different physical scales were further advanced and linked by combining physics- and data-based modelling. The next step is the implementation of control concepts for single- and multi-stage processes (process chain). Automatic adjustment of the devices, compensation of unforeseen disturbances, acceleration of start-up and shut-down, planning and control of optimal trajectories of batch processes under consideration of uncertainties and process relevant quality criteria (e.g. energy and raw material efficiency). Nonlinear, optimization based and robust control methods are applied. This is a new challenge for RFB and the topic for a innovative Ph.D. thesis.
Personal qualification	<ul style="list-style-type: none">• In accordance with the European Union's funding rules for doctoral networks, applicants must NOT yet have a PhD• Very good Master in chemical or mechanical engineering or any other background in simulation technologies• Solid background in the fundamentals of heat and mass transport and in chemical engineering• Experience in CFD and/or control simulations and programming• Curiosity and creativity• Ability to organize and structure an exploratory project• Fluency in English (min. C1) and if possible German

Salary A monthly gross salary of app. € 3.200,-

That is what we offer The scientific work is part of the Doctoral Network "PREDICTOR", which is financed by the European Union under the framework of the program HORIZON Europe, Marie Skłodowska-Curie Actions. Marie Skłodowska-Curie Doctoral Networks are joint research and training projects funded by the European Union. Funding is provided for doctoral candidates from both inside and outside Europe to carry out individual project work in a European country other than their own. The training network "PREDICTOR" is made up of 22 partners, coordinated by Fraunhofer ICT in Germany. The network will recruit a total of 17 doctoral candidates. The doctoral candidate will be hired for 36 months under contract by the Karlsruhe Institute of Technology. The applicant must not have resided or carried out her/ his main activity (work, studies etc.) in Germany for more than 12 months in the past 3 years.

Starting date: As soon as possible

Application up to: 31.10.2024

Contact person in line-management: Prof. Dr. Hermann Nirschl
Institute for Mechanical Process Engineering
76131 Karlsruhe
Email: Hermann.nirschl@kit.edu

Application: We prefer to balance the number of employees (f/m/d). Therefore, we kindly ask female applicants to apply for this job.

Recognized severely disabled persons will be preferred if they are equally qualified.