

Personalservice (PSE) (/)

Vacancy No. 2144/2023

Research Associate (f/m/d)

Job description

The Institute for Concrete Structures and Building Materials, Department of Building Materials and Concrete Construction, and the MPA Karlsruhe are headed by Univ.-Prof. Dr.-Ing. Frank Dehn and are among the leading German institutions on material testing and research in the field of concrete construction. You will be part of the research group Numerical modelling and Digitalization for Building Materials and Concrete Structures headed by Dr. Ravi Patel. The research group works on a wide range of topics such as nonlinear finite element modelling, Multiphysics and multiscale modelling, thermodynamic modelling and reactive transport modelling, image-based modelling, machine learning applications such as damage detection and physics informed machine learning and topics related to digitalization of laboratory data and data management. The working group strongly collaborates with other research groups within the institute to further conduct experiments required to develop and validate the models. This provides a unique work environment to bridge both fundamental theoretical modelling as well as experiments.

Your main task will be to support research on Multiphysics modelling of long-term evolution of concrete structures in service environment to provide reliable service life predictions for critical infrastructures such as nuclear reactors, bridges, tunnels, etc. This involves the development and implementation of coupled thermo-hydro-chemo-mechanical models within existing open-source frameworks to account for a wide range of degradation mechanisms such as drying shrinkage, carbonation induced corrosion, and alkali-silica reaction which a concrete structure undergoes during its lifetime. You will have the opportunity to further develop your skills in this field to achieve doctoral qualification. You will also have the opportunity to conduct experiments, take part in other research activities of the group closely related to your topic as well as support in the teaching and consulting duties.

Personal qualification

- Master in civil engineering, mechanical engineering, material science, mathematics or similar
- Already gained fundamental understanding of programming numerical methods such as finite element and finite volume methods
- Familiar with or willing to learn about Multiphysics modelling of coupled processes in porous media.
- Good experience in programming with C++, python, MATLAB or Fortran
- Familiar with use of linux based system and version controlling using git.
- Fluent spoken and written English and preferably good command on spoken and written German.

Salary

Salary category 13, depending on the fulfillment of professional and personal requirements.

Organizational unit

Institute of Concrete Structures and Building Materials - Building materials and

concrete construction (IMB)

Starting date

1 August 2023 or earliest possible date after mutual agreement

Contract duration

limited to three years

Application up to

30 June 2023

Contact person in line-management

For further information, please contact Dr. Patel, email: ravi.patel@kit.edu
(<mailto:ravi.patel@kit.edu>).

Application

Please apply with a cover letter, your CV and all certificates. If you have written a master's thesis that involves the finite element method, numerical modeling, or multiphysics models, please feel free to provide the file (max. 10 MB).

Application

Please apply **online** using the button below for this vacancy number 2144/2023 .
Personnel Support is provided by

Ms Carrasco Sanchez

phone: +49 721 608-42016,

Kaiserstr. 12, 76131 Karlsruhe

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.

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