

PhD position in Materials Mechanics/Numerical Engineering/Statistical Physics “Digital Material Twin for Resource-efficient Metallic Microstructures”

- Job description:** Innovative materials play a key role in reducing carbon emissions and promoting sustainability. Consideration of performance should begin with the microstructural composition of the materials, since microstructural properties are the core of e.g. strength, corrosion resistance and lifetime. These properties can be permanently changed by manufacturing, loading and forming processes. A fundamental understanding of the physical mechanisms that characterize and determine the microstructure properties therefore enable the development of special-tailored materials that can exploit their full potential and can be precisely adapted to the process chain associated with an application. In this project, a digital material twin for metallic microstructures shall be created based on the evaluation of microstructures on different length scales. The goal is to further develop physically based material models, which preserve important physical phenomena and yield a continuum representation of microscale mechanisms based on statistical physics. With the incorporation of a meaningful homogenization of defect structures coupled with data-driven approaches, an advanced numerical formulation shall be established which bridge the modelling of plastic material behavior from the micro to the macro scale.
- Qualification:** Candidates should hold an MSc degree (or equivalent) in material science, numerical mathematics, mechanical engineering, or physics with a solid theoretical background and interest in statistical physics and numerics. Additional knowledge of materials mechanics, finite elements, C/C++, modern data analysis/machine learning, or experience with other simulation methods is an asset.
- Salary:** The remuneration occurs on the basis of the wage agreement of the civil service in Germany in TV-L, E13.
- Institute:** University of Applied Sciences Karlsruhe in cooperation with the Institute for Applied Materials – Reliability and Microstructure (IAM-ZM), Karlsruhe Institute of Technology, Karlsruhe, Germany.
- Starting date:** As soon as possible
- Application up to:** February, 28th, 2024
- Contact person:** For more information please contact Prof. PD Dr.-Ing. Katrin Schulz, E-mail: katrin.schulz@kit.edu

Application:

Interested candidates are asked to send a motivation letter, curriculum vitae, transcripts of grades, and contact information for at least one academic reference to katrin.schulz@kit.edu



HKA and KIT are equal opportunity employers. Women are particularly encouraged to apply. Applicants with disabilities will be preferentially considered if equally qualified.