2 Doctoral Positions in Materials Mechanics and Engineering
Computational and Experimental Investigation of Interpenetrating Metal/Ceramic Composites

Job description:

The Institute for Applied Materials (IAM) is a leading institution in research and education in materials science and technology. With its interdepartmental character it is one of the largest facilities of Karlsruhe Institute of Technology (KIT). It pursues an interdisciplinary approach to materials research that covers the diversity and multiscale character of materials science. In cooperation with national and international partners, we study materials from their atomic structure to their function in the product. Our activities bridge the gap from materials development over process technology to systems integration.

Within the scope of a research project, two workgroups of the divisions of „Computational Materials Science“ (IAM-CMS) and “Materials Engineering” (IAM-WK) collaborate within the research field of the processing, characterization and modeling of interpenetrating composites (IPC) based on highly homogeneous ceramic foam preforms. The research project has a holistic view on these novel IPCs and is hence subdivided in a numerical and an experimental part with one academic position each. Consequently, the planned investigations deal with the processing of the IPCs, including the process-accompanying analysis of the composite's constituents, the experimental mechanical and microstructural investigation as well as the modeling and numerical characterization of these composites and the ceramic foam structures used. Near-application loads include mechanical, thermal and thermo-mechanical loading conditions. The damage behavior is to be analyzed and described in different load cases by in-situ and ex-situ as well as numerical investigations, in order to obtain a precise understanding of the damage mechanisms, the damage evolution, and the fatigue behavior of the composite.

Qualification:

Regarding the numerical part of the research project candidates should hold an MSc degree (or equivalent) in physics, material science, numerical mathematics or mechanical engineering with a solid theoretical background and interest in statistical physics or numerics. Additional knowledge of materials mechanics, finite elements, C/C++, modern data analysis, or experience with other simulation methods is an asset.

Regarding the experimental part of the research project candidates should hold an MSc degree (or equivalent) in physics, material science and engineering or mechanical engineering with a solid theoretical background and profound interest in the processing and experimental characterization of structural and/or composite materials. In this regard, knowledge in planning, implementation and statistical evaluation of experimental investigations is a prerequisite. Additional knowledge of materials mechanics or modern data analysis is an asset.

Furthermore for both positions an independent and systematic way of...
working as well as profound German / English writing and communication skills are required.

**We offer:** We offer an attractive and modern workplace with access to excellent facilities of KIT, diverse and responsible tasks, a wide scope of advanced training options, supplementary pension with the VBL (Pension Authority for Employees in the Public Service Sector), flexible working time models, a job ticket (BW) allowance, and a cafeteria/canteen.

**Salary:** The remuneration occurs on the basis of the wage agreement of the civil service in TV-L.

**Institute:** Institute for Applied Materials – Computational Materials Science (IAM-CMS), Karlsruhe Institute of Technology (numerical part of the project).
Institute for Applied Materials – Materials Engineering (IAM-WK), Karlsruhe Institute of Technology (experimental part of the project).

**Contract duration:** limited

**Starting date:** As soon as possible

**Application up to:** 30.11.2018

**Contact person in line-management:** For more information please contact
Dr.-Ing. Katrin Schulz, E-mail: katrin.schulz@kit.edu
Prof. (apl.) Dr.-Ing. Kay Weidenmann,
E-Mail: kay.weidenmann@kit.edu

**Application:** Interested candidates are asked to send a motivation letter indicating the research field you apply for, curriculum vitae, transcripts of grades, and contact information for at least one academic reference in a single PDF file electronically to Katrin Schulz (katrin.schulz@kit.edu, simulation position) or Kay Weidenmann (kay.weidenmann@kit.edu, experimental position)

Applications are accepted in both English or German. Incomplete applications will not be considered.

We prefer to balance the number of female and male employees. Therefore we kindly ask female applicants to apply for this job.

If qualified, handicapped applicants will be preferred.

**Karlsruhe Institute of Technology**
**Personalservice**

KIT is certified as a family-friendly university (familienfreundliche Hochschule) and offers part-time employment, leaves for family-related reasons, dual career options, and individual coaching for family-work balance.