Opening PostDoc position at the Institute for Applied Materials

Development of 4D STEM-in-SEM for in situ micromechanical testing

The Institute for Applied Materials – Mechanics of Materials and Interfaces (IAM-MMI) at the Karlsruhe Institute of Technology (KIT) strives for a fundamental understanding, prediction and optimization of mechanisms responsible for the degradation of advanced functional material systems. Our material portfolio comprises, among others, materials required for the energy transition, i.e. for energy conversion and storage as well as advanced structural materials.

The IAM-MMI is looking for a motivated postdoc with a strong background in materials science. The focus of the project is the development of 4D STEM-in-SEM technique for in situ micromechanical testing in order to understand degradation mechanisms of materials in real- and reciprocal spaces. You will contribute to establishing a new detector system in SEM and its application on advanced materials. Material systems of interest are (i) single phase model materials, for example Si or copper, and after the successful implementation and validation of the technique (ii) functional material systems and advanced alloys.

You will have the following tasks:

- Design and implement protocols for 4D STEM-in-SEM technique which is compatible with in situ SEM nanoindenter. A pixelated detector and on-axis TKD detector will be installed on Zeiss Merlin SEM to obtain diffraction patterns in SEM.
- Specimen preparation by focused ion beam (FIB) milling and femto-second laser ablation as well as image them with scanning electron microscopy. Fabrication of micropillars or microtensile bar samples.
- Collect and analyze 4D STEM data using py4DSTEM or LiberTEM packages. Various information can be obtained from the diffraction patterns, for example annular bright-/dark-field imaging and strain mapping.
- Taking charge of in situ indenter, Bruker Hysitron PI-89. Assist PhD and Masters students with installation and using the in situ SEM indenter.

You should hold a PhD in physics or materials science. Experiences in micromechanics and electron microscopy are beneficial.

Besides a state-of-the-art laboratory at the IAM and an inclusive, caring as well as supportive atmosphere, we can offer one-year postdoc contract (TVL-E13) which can be extended after positive evaluation. We encourage applicants of different cultures, ethnicities and beliefs – indeed this very diversity is vital to our success, it is fundamental to our values and enriches life at the institute.

The call for applications is open until filled.

For more information, do not hesitate to contact either one of us.

Prof. Christoph Kirchlechner  
christoph.kirchlechner@kit.edu

Dr. Subin Lee  
subin.lee@kit.edu