

The Department Structure and Nano-/Micromechanics of Materials (Prof. G. Dehm) offers a

PhD student or Postdoc position in “Grain Boundary Phases in Ni based Solid Solution Thin Films” f/m/div

We are looking to hire a PhD student or Postdoc in the field of Materials Science/Materials Physics/Materials Chemistry to work on the atomic structure of grain boundaries in Ni based thin films by employing different scanning/transmission electron microscopy techniques including atomic resolved imaging, spectroscopy, electron diffraction, image simulations and *in situ* thermal and mechanical experiments.

Your tasks

You will investigate the atomic structure and defects of grain boundaries in Ni and Ni alloy thin films across different length scales. With the help of EBSD in the SEM you will resolve the grain structure and misorientation between the grains at the micrometer level. Using focused ion beam milling samples will be extracted from pre-selected grain boundaries for further TEM and STEM analyses at the nanometer and atomic level. The tasks include to analyze the grain boundary planes and facets as well as disconnections. At atomic resolution, the structure motifs of the grain boundaries will be determined and compared to atomistic simulations done in collaboration with our simulation experts at the institute.

The mobility of the grain boundaries during thermal exposure as well as their mechanical properties will be studied by *in situ* electron microscopy experiments using MEMS based testing platforms, to clarify how much these properties depend on the character of grain boundaries.

You will disseminate the outcome of your research in the form of scientific publications and present them at international scientific conferences.

Your profile

PhD student: You have a Masters degree with good to excellent marks in Materials Science, Material Physics, Mechanical Engineering, Nanotechnology or a related field and you would like to work on challenging problems in Materials Science. The work requires high level of experimental skills and analytical mind set for interpreting the measured data. Through your studies, you acquired in-depth knowledge of material defects, thermodynamics, mechanical properties and materials characterization. You will gain knowledge in different electron microscopy and ion microscopy techniques, electron diffraction, electron based spectroscopy and atomic resolved transmission electron microscopy techniques. Having previous publication experience and hands-on experience in microscopy or diffraction is highly advantageous.

Postdoc: You hold a doctoral degree with very good to excellent marks in Materials Science, Material Physics, Materials Chemistry, Nanotechnology or a closely related field. You also have an excellent publication record, focussed primarily on S/TEM techniques and related techniques. You have performed image interpretation preferentially by image simulation and/ or experience with *in situ* SEM/STEM/TEM experiments. Previous research experience specifically related to sample preparation and analytical electron microscopy techniques are highly advantageous.

The working language at our institute is English; excellent proficiency in English to communicate effectively on scientific topics is required.

What we offer

The Department Structure and Nano-/Micromechanics of Materials aims at pushing the boundaries of our understanding of materials and their imperfections. We aim at unravelling the interplay between atomistic structures of imperfections and properties of materials by combining different experimental methods.

You will benefit from the department's excellent access to bleeding-edge experimental infrastructure and intellectual resources, along with plenty of possibilities for personal and professional development in a highly interdisciplinary environment.

PhD positions are typically limited to 3 years, with the possibility to extend if the scientific progress and funding permits. The postdoc position is available for 2 years.

The Max-Planck-Institut für Eisenforschung GmbH is committed to employing more handicapped individuals and especially encourages them to apply. The Max Planck Society strives for gender and diversity equality. We welcome applications from all backgrounds.

Deadline for application: December 6, 2023

Expected starting date: As soon as possible

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