

The Technical University of Munich operates the Research Neutron Source Heinz Maier-Leibnitz (FRM II) in Garching near Munich as one of the most powerful and modern neutron sources worldwide. As a service facility for science and a service provider for industry, we occupy a leading position in the field of research with neutrons and their technical use.

Starting spring 2022, the working group “High Density Nuclear Fuels” at the research neutron source Heinz Maier-Leibnitz (FRM II) is looking for a:

B.Sc. student - working student - internship (m/f/d) Physics - Engineering - Materials science - Comparable studies

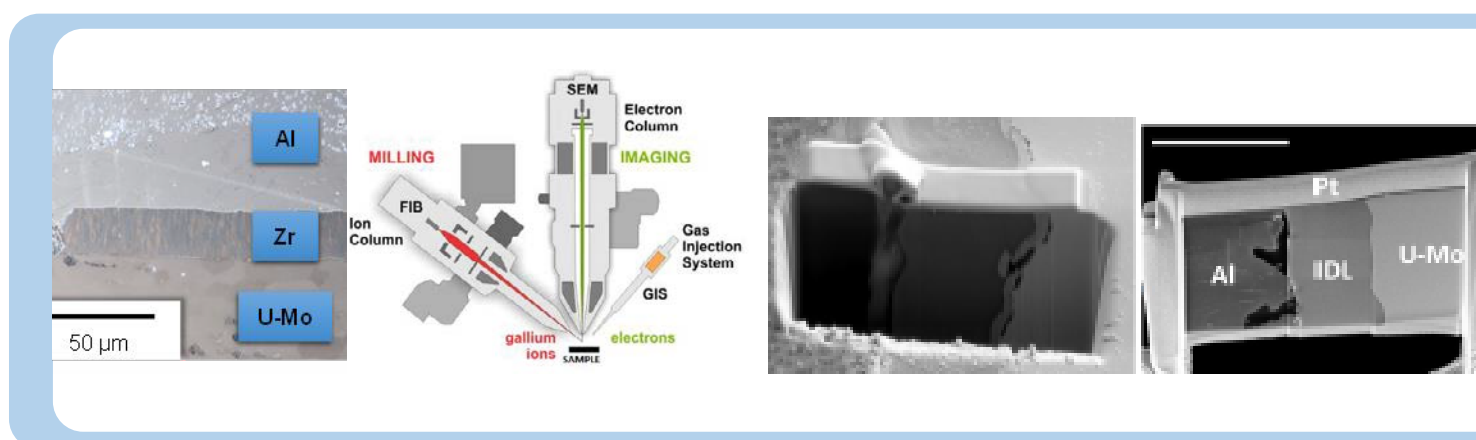
Developing a production procedure for multilayer TEM Lamellae for STEM/TEM analysis

The research working group “High Density Nuclear Fuels” at the research reactor FRM II is working on the qualification of newly-developed high-density nuclear fuels in Europe. The most promising candidates are a metallic uranium-molybdenum alloy fuel (U-Mo) or high-density uranium silicide (U_3Si_2), both using aluminum-based cladding. Therefore, scientists in the fields of physics, chemistry, engineering, physical technology and computer science are working intensively together on fuel fabrication technologies, the determination of material properties as well as the irradiation behavior of such fuels.

For metallic uranium-molybdenum fuel systems a zirconium diffusion barrier is established using Physical Vapor Deposition (PVD) in order to prevent intermixing with the aluminum cladding. The properties of these multilayers are examined with Scanning Electron Microscopy (SEM), Scanning Transmission Electron Microscopy (STEM) and Transmission Electron Microscopy (TEM). Therefore, the scope of this project is to develop a standardized production procedure with the Focused Ion Beam and Scanning Electron Microscope (FIB-SEM) to shape the multi-layers into a defect-free lamella.

The practical work will also include sample preparation and manufacturing, polishing techniques such as Ion Milling and mechanical polishing

The tasks typically involve working in radiation protection areas with open handling of radioactive materials such as uranium. The high security standard of FRM II generally requires a security clearance according to the German atomic law.



In case of an online application please send the documents compiled in a PDF file.