FRM II
Forschungs-Neutronenquelle
Heinz Maier-Leibnitz

Technische Universität München

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

M.Sc. student / working student / internship

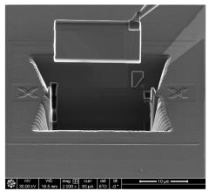
Post-irradiation examination of U-Mo/Al based fuel samples irradiated by swift Xe ions

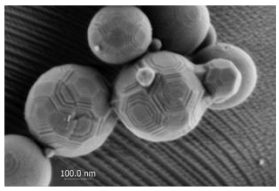
The research working group “High Density Nuclear Fuels” at the research reactor FRM II is working on the qualification of newly-developed high-density nuclear fuels in Europe. The most promising candidates are a metallic uranium-molybdenum alloy fuel (U-Mo) or high-density uranium silicide (U_3Si_2), 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.

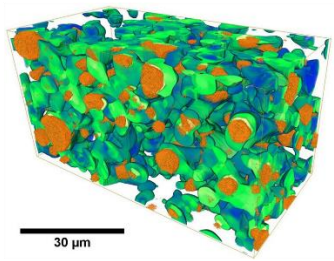
The past test irradiations of U-Mo/Al fuels showed an unsatisfying irradiation behavior. This is mainly caused by the growth of an interdiffusion layer (IDL) between the two materials. To thoroughly study this phenomenon and find proper solutions, U-Mo/Al fuels with selected diffusion coating barriers have been prepared and shipped to Argonne National Laboratory (US) for ion irradiation tests, which can very well simulate in-reactor irradiation at a much lower cost. The applicant for this topic is supposed to work on the post-irradiation examination followed by the irradiation experiment with advanced techniques such as scanning electron microscopy (SEM) equipped with focused ion beam (FIB) sample preparation and element detection by energy-dispersive X-ray spectroscopy (EDX), electron backscatter diffraction (EBSD), as well as transmission electron microscopy (TEM).

Best suited are students studying physics, engineering, materials science or comparable studies.

We are looking forward to your application.







New advanced SEM/FIB/EBSD system

Further information on the fuel development at FRM II can be found at
https://www.frm2.tum.de/en/fuel-development

For questions and applications, please contact

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Framework conditions
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.