

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)

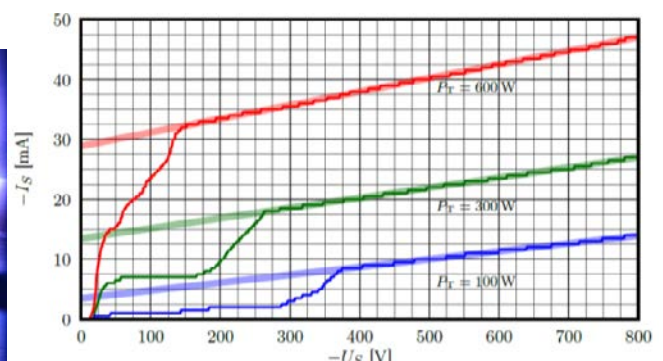
## Physics - Engineering - Materials science - Comparable studies

### Plasma parameters of a PVD coating process for U-Mo fuels

The working group “High Density Nuclear Fuels” at the Research Neutron Source Heinz Maier-Leibnitz (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 ( $\text{U}_3\text{Si}_2$ ), 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 diffusion barrier is established using Physical Vapor Deposition (PVD) in order to prevent intermixing. The scope of this project is to do a parameter study on a PVD device regarding the ion and electron bombardment during the coating of the substrate material in order to get a better understanding of the growing layer. This will be used to better control the growth structure of the zirconium coatings in a way that it acts as a good diffusion barrier and also withstands the mechanical stresses of subsequent cladding applications. The practical work may also include sample preparation and polishing techniques.

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.