



# THM

TECHNISCHE HOCHSCHULE MITTELHESSEN



# IMPS

Institut für Medizinische Physik  
und Strahlenschutz

## Institutsseminar im Sommersemester 2022

Ankündigung für den Vortrag von **Prof. Dr. Laleh Rad**,  
**Northwestern Univ., Chicago**, am **07.07.2022** um **18Uhr**.

das IMPS



**ZOOM Zugangsdaten**

Meeting ID: 829 6689 1755

Kenncode: 006601

das Seminar



### **Toward implant-friendly MRI: How novel MRI hardware, new surgical techniques, and AI-powered risk assessment are changing the landscape**

More than 20 million European/American currently carry a form of orthopedic, cardiovascular, or neuromodulation device and the number grows by 100,000 annually, driving medical implant market to reach \$160 billion by 2021. It is estimated that 50%-75% of patients with active electronic implants will need to undergo MRI during their life time, with some needing repeating examination. Recent advances in device engineering have led to a new generation of electronic implants that are largely immune to MRI-generated static and gradient fields. Tissue heating from radiofrequency (RF) excitation fields, however, remains a major issue.

This talk will give an overview of recent advances in development of specialized MRI hardware for implant-friendly imaging with a focus on patients with deep brain stimulation implants. We then discuss the unique role of computer modeling in MRI safety assessment and recent success stories in guiding the surgical practice toward MR-friendly device implantation, and novel insights into RF heating of implants in new MRI platforms (e.g., vertical scanners). Finally, we will talk about feasibility of applying machine learning for real-time risk assessment of MRI in patients with conductive implants.