



PhD Position in Experimental Dosimetry for MR-Guided Ion Therapy

We are seeking an ambitious and motivated PhD candidate to join an exciting research project in the field of **experimental dosimetry for MR-guided ion therapy** at the Medical University of Vienna in collaboration with the MedAustron ion therapy center, Austria. This position is part of the cross-institutional, international project **DosiMagic**.

Project Overview:

Ion beam therapy offers superior dose precision and biological effectiveness over photon therapy, improving tumor targeting while sparing healthy tissues. However, its potential is limited by the available image guidance. Integrating Magnetic Resonance (MR) imaging could transform this field by enabling real-time adaptation with excellent soft-tissue contrast, enhancing precision for anatomical changes. The **DosiMagic** project aims to **overcome** the **technical challenges** in MR-guided ion beam therapy, focusing on the perturbative effects of **magnetic fields on dose distribution and detector responses**. Its goals include studying magnetic field impacts on beam quality of ion beams, developing correction factors for accurate dosimetry, and creating best practices for particle therapy dosimetry in magnetic fields. Collaborating across five German and Austrian institutions, the project combines advanced **ion beam experiments** with **Monte Carlo simulations**.

The **PhD candidate** will be involved in cutting-edge research focused on extending **experimental dosimetry** techniques for ion beams in **magnetic fields** at the **MedAustron Iontherapy Center**. The study will evaluate detectors for dosimetry tasks in MR-guided particle therapy. Experiments will investigate different influence factors on the detector reading due to e.g. detector orientation, magnetic field strength, particle type or energy. Correction factors will be derived, and changes in recombination and polarity effects will be analyzed. The experiments will be complemented by Monte Carlo simulations to support understanding the influence of measurement conditions and magnetic fields.



Key Responsibilities:

- Design, prepare, conduct and evaluate dosimetry experiments with ion beams in a magnetic field environment at the MedAustron ion therapy center
- Adapt, design and manufacture phantoms and detector mounting devices
- Work with a diverse set of active and passive dosimetry detectors
- Collaborate with other researchers from multiple institutions and contribute to writing scientific publications
- Assist in Monte Carlo modelling of the experiments and the translation of research findings into practical clinical guidelines for MR-guided particle therapy



Requirements:

- A Master's degree in (Medical) Physics, Biomedical Engineering (with Physics background) or a related field
- Experience in experimental laboratory work, ideally in radiation measurements
- Knowledge of Monte Carlo simulation codes (Geant4, FLUKA, ...) and Python is an advantage
- Experience in 3D manufacturing technologies and design is an advantage
- Good communication skills and the ability to work in a collaborative environment
- Analytical skills and ability to work independently on a project basis
- Fluent in English (oral and written)

We Offer:

- A PhD position funded by the Austrian Science Fond (FWF), covering all research costs, work-related travel expenses, salary and health insurance for 3 years
- Enrollment in the Doctoral PhD program N094 at the Medical University of Vienna
- Access to state-of-the-art research facilities at MedAustron, including a dedicated research beam line and advanced dosimetry equipment
- Opportunities to collaborate with leading researchers in radiation physics from multiple universities in Germany and Austria
- A stimulating international environment with opportunities for professional growth

Location:

The position will be based at the labs of the Medical University of Vienna located at the **MedAustron ion therapy center** in Wr. Neustadt, Austria.

If you are enthusiastic about contributing to the future of **MR-guided particle therapy and experimental dosimetry** and would like to be part of an interdisciplinary research team working at the forefront of cancer treatment technology, we encourage you to apply.

Please submit your **CV, a motivation letter, and a letter of support** to Hermann Fuchs (hermann.fuchs@meduniwien.ac.at).