

Research focus of the department of “Physics of Molecular Imaging Systems” (**PMI**) of the University RWTH Aachen is on exploring the physical limits of current and future molecular imaging technologies. These areas range from simulations of new detector concepts, hardware prototypes, high-speed data processing, image reconstruction algorithms and applications using our research imaging prototypes. Our group consists of students and researchers from different disciplines: physics, engineering, computer science and medicine. PMI is part of a large international network with a close link to industry, especially Philips Research.

PhD/Postdoc for whole body Time-of-Flight-PET-MRI for Radiotherapy

Hybrid simultaneous acquisition of Positron Emission Tomography (**PET**) and Magnetic Resonance Imaging (**MRI**) data has gained interest in clinical and preclinical research, due to their complementary information. PET allows imaging of metabolic processes down to the molecular level while MRI provides anatomical information with high soft tissue contrast and physiological parameters. Our group developed the world’s first small bore MR-compatible PET insert on basis of **fully digital Silicon Photomultipliers (dSiPM)** that enables true simultaneous Time-of-Flight(TOF)-PET/MRI studies in clinical MRI scanners. Recently, attempts have been made to combine PET-MRI with MR-LINAC for the next generation radiation therapy including therapy planning and simulation.

Scope of the project is to develop an ultra-high integrated TOF-PET detector for a next generation clinical PET-MRI system to offer outstanding imaging performance at highest patient comfort. This system will be developed as an ultimate therapy simulation/planning device for radiotherapy with an high-field MR-LINAC systems. The project will be executed in a consortium with another leading university and Philips as industrial partner. First tests, which addresses the interference of the two very complex imaging modalities, were already successful. Target of the project is to push the physical limits on TOF-PET.

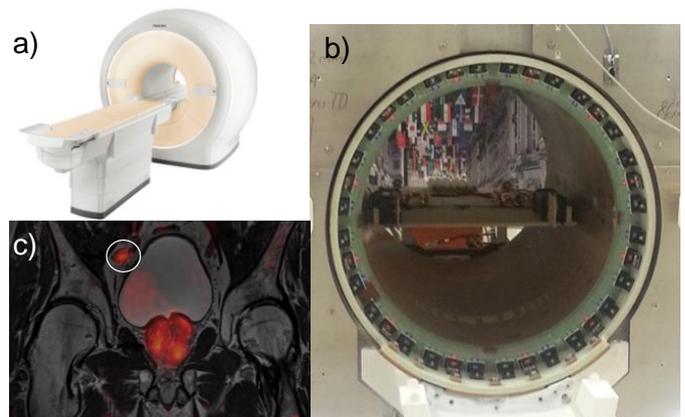


Fig: a) Clinical MRI system; b) prototype PET-detector; c) PET-MRI with PET positive lymph node.

New group members should be highly motivated and creative, show an exceptional track record, and have a strong background in mechanical engineering, electrical engineering, or related fields, and be interested in working in an interdisciplinary environment at the interface of imaging physics and medicine. In particular, you should have an interest in the design of MR-compatible electronics or mechanics and in the overall engineering of imaging systems. You will work in a project team of about 12 very experienced scientists at PMI with close cooperation to leading university groups, to the Radiology and Nuclear Medicine departments of the University clinic RWTH Aachen and to leading industry.

The positions are fully funded (100% employment). In order to apply, please submit a complete application, consisting of a cover letter, your CV, university transcripts, and the coordinates of at least two referees as a single PDF file via email to Prof. Dr.-Ing. Volkmar Schulz (schulz@pmi.rwth-aachen.de) with “[pmi-application: WB-TOF-PET]” in the subject line. The preferred starting date for these positions is Q4-2017 - Q1-2018.