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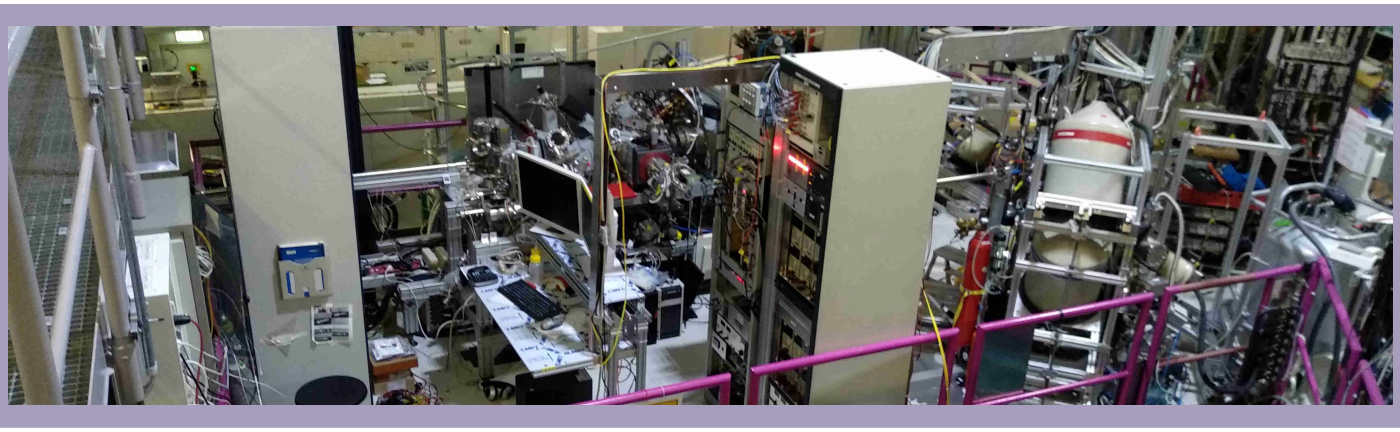
The NEutron-induced POsitron source MUniCh (NEPOMUC) at FRM II at the TUM provides the worlds most intense anti-matter beam. In addition, the positron physics research group operates further β^+ emission sources in its TUM laboratories. Our research covers a wide range of topics ranging from basic to material science.

Master's Thesis

Electrostatic Positron Beam Guiding

The mono-energetic positron beam at TUM allows state-of-the-art depth dependent measurements of open void defects and chemical composition by measuring the Doppler broadening of the 511 keV annihilation line as well as investigation of the formation of positronium. In the current experimental setup, magnetic fields guide the positron beam and an increase in the field strength provides focusing onto a sample surface. However, the presence of a magnetic field at the sample location is not necessarily desirable, since it can limit the sample geometry and material. Furthermore, in cases where positronium is studied, the magnetic field can complicate data analysis since it can suppress positronium formation.

To address this issue, this project will replace the existing magnetic focusing with an electrostatic focusing system. The work will involve design and simulation of a new electrostatic lens and magnetic field termination and will include initial experimental benchmarking of the constructed setup. The project is carried out within the TUM research group Physics with Positrons.



In our group you will have the chance to experience applied physics research first hand. You will collaborate with both scientist and engineers and gain insight into the way a large research facility is operated.

Please send applications to Dr. Danny Russell. If you apply online, please send the documents collected in one PDF file.