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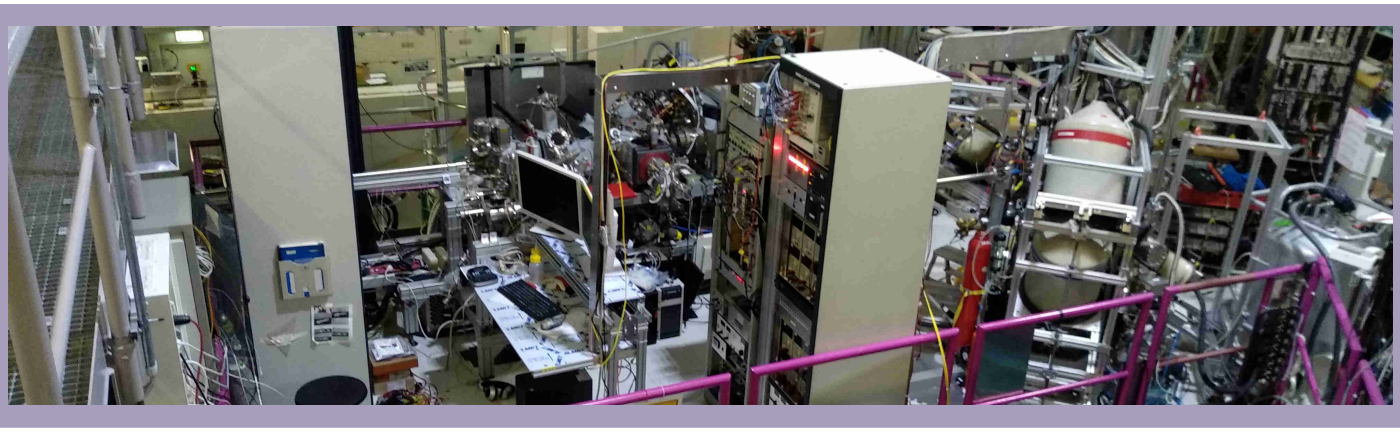
The NEutron-induced POsitron source MUniCh (NEPOMUC) at FRM II at the TUM provides the worlds most intense anti-matter beam. In addition, the positron physics research group operates further β^+ emission sources in its TUM laboratories. Our research covers a wide range of topics ranging from basic to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

Bachelor's Thesis

Imaging Positronium by Coincident Gamma Detection

Positronium (Ps) is the bound state of an electron and its antiparticle, the positron. It can be emitted from the surface of a solid sample when bombarded with slow positrons. Due to its simplicity, Ps is used in many investigations of fundamental physics including QED and matter/antimatter symmetry. These applications require a large number of Ps atoms with a controllable kinetic energy. Achieving this remains an active field of research.

This project will investigate the energy distribution of Ps emitted from different sample surfaces. Pixelated scintillation detectors will be used to image the annihilation radiation from Ps as it travels away from the sample surface in vacuum. Since the lifetime of Ps in vacuum is know (142 ns) the Ps velocity distribution can be calculated. The work will include the design of a new, heated sample holder and surrounding vacuum components and measurements using a pair of pixelated scintillation detectors. 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.