chemisch
physikalische
gesellschaft

Gegründet im Jahre 1869 von H. Hlasiwetz, J. Loschmidt, J. Petzval und J. Stefan

EINLADUNG

zum Vortrag
von

Dr. Anna Niggas

Loschmidt-Preisträgerin 2024
für ihre an der Technischen Universität Wien durchgeführte Dissertation

On the interaction of slow highly charged ions with free-standing two-dimensional materials

Betreuer: Univ.Prof. Dr. Richard Wilhelm
Institut für Angewandte Physik

am Dienstag, 25. März 2025, um 17:30 Uhr

Ort: Lise-Meitner-Hörsaal, Fakultät für Physik, Universität Wien,
1090 Wien, Strudlhofgasse 4 / Boltzmanngasse 5, 1. Stock
Barrierefreier Zugang: Boltzmanngasse 5, Lift, 1. Stock rechts über den Gang zum Hintereingang des Hörsaals

Abstract:
What sets ion beams apart from experiments with electrons, neutrons, or photons is an additional parameter besides the (kinetic) energy, which can be independently varied: By removing more and more electrons from an initially neutral atom, a potential energy is stored. For highly charged ions, e.g., Xe^{40+}, this potential energy can reach up to 40 keV and – in the case of very slow projectiles – may even exceed the amount of available kinetic energy in the interaction process with a sample.
Upon approaching a material surface, slow highly charged ions deposit their potential energy within the very first layers of a material, leading to the neutralisation of the projectile and the emission of secondary electrons and photons. Using two-dimensional materials as targets in transmission geometry, we can now investigate not only this secondary particle emission but also detect the projectiles themselves after the interaction. For these experiments, we apply a coincidence spectroscopy technique, i.e. we measure correlated pairs of transmitted ions and emitted electrons, allowing us to unravel complex charge exchange processes. In this presentation, I will discuss how fast the neutralisation of a slow (highly charged) ion happens *within* the material and how different electronic sample properties may influence these dynamics.

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