PHYSIKALISCHES KOLLOQUIUM

Sommersemester 2025

Das Kolloquium findet (soweit nicht anders angegeben) **jeweils montags um 14:15 Uhr in Präsenz im Röntgen-Hörsaal** des Physikalischen Instituts, Hubland Campus Süd, Universität Würzburg **und online via Zoom statt**.
Zugangsdaten siehe https://www.physik.uni-wuerzburg.de/aktuelles/veranstaltungen-aus-der-physik/physikalisches-kolloquium/

26.05.2025

Prof. Dr. Christoph Keitel
Ruprecht-Karls-Universität Heidelberg und Max-Planck-Insitut für Kernphysik

Quantum Dynamics in Extreme Electromagnetic Fields at the Limit: From fast Particles to New Physics

Abstract

The talk introduces into the research area of quantum dynamics in extremely strong electromagnetic fields with a focus on intense laser pulses and highly accelerated lepton beams. For this purpose, effects like quantum radiative reaction and vacuum polarization will have to be taken into account and explained. The extreme parameter domain for high-energy lepton beams counter-propagating extreme laser pulses, but also very highly charged ions and nuclei in extreme environments are then shown to offer new territories for quantum dynamics with potential The talk introduces into the research area of quantum dynamics in extremely strong electromagnetic fields with a focus on intense laser pulses and highly accelerated lepton beams. For this purpose, effects like quantum radiative reaction and vacuum polarization will have to be taken into account and explained. The extreme parameter domain for high-energy lepton beams counter-propagating extreme laser pulses, but also very highly charged ions and nuclei in extreme environments are then shown to offer new territories for quantum dynamics with potential for testing fundamental equations at the limit and thus for the search of new physics. In addition various applications are presented such as for the generation of high-quality polarized high-energy particle and gamma-ray beams

Für die Dozentinnen bzw. Dozenten der Fakultät

Prof. Dr. Hankiewicz, Prof. Dr. Hinkov, Dr. Meyer, Dr. Feichtner, Hr. Baumbach