



CRC 1227
Designed Quantum States of Matter



BLOCK LECTURE

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(Guest of Prof. Piet Schmidt and Prof. K. Hammerer)

Leibniz Universität Hannover
Welfengarten 1
30167 Hannover

09 November 2023, 10:00 am
Welfengarten 1, Building 1101, Seminar room D326

and

10 November 2023, 10:00 am
Callinstraße 36, Building 3406, Seminar room 317

Title: "Probing Nuclear Structure and Fundamental Interactions by Laser Spectroscopy at Accelerators"

Laser spectroscopy is a unique and sensitive tool to probe the electronic structure of atoms and ions. If measurements are performed with high resolution, the resonance frequencies provide also access to details of the nuclear structure and may provide hints on new physics beyond the standard model. This is of particular interest if species are investigated that are only available at accelerator facilities. In this lecture I will present a selection of activities in this field. The first block will be devoted to nuclear structure studies of short-lived isotopes. General production techniques of the exotic particles, their preparation and spectroscopy and the extraction of the nuclear properties from the spectra will be exemplified. Results of such experiments are important benchmarks for nuclear structure theory but have also applications in astrophysics or particle physics. The second block will be concerned with laser spectroscopy of highly charged ions at storage rings. The main topic here are tests of fundamental symmetries but lasers can also be used to address and modify the ions outer and inner degrees of freedom.

All DQ-mat members and all interested are cordially invited to attend.