



Einladung zum  
**Physikalischen Kolloquium**  
**Wintersemester 2022/2023**

Physikzentrum der Technischen Universität Braunschweig

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**Prof. Dr. Wilfried Nörtershäuser**

(TU Darmstadt)

will give a talk on

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**November 8<sup>th</sup>, 16:45, MS 3.1**

**Collinear Laser Spectroscopy of Highly  
Charged Ions for Nuclear Structure and  
Fundamental Research**

Abstract: Collinear laser spectroscopy has been applied on beams of highly charged ions from the keV to the GeV range. Helium-like systems of light isotopes are studied at the Collinear Apparatus for Laser Spectroscopy and Applied Science (COALA) at TU Darmstadt to extract nuclear charge radii and nuclear moments of stable isotopes. This approach is based on nonrelativistic QED calculations with the highest currently achievable accuracy. At the Experimental Storage Ring (ESR) at GSI Darmstadt, heavy highly charged ions were studied to test QED in the strongest magnetic fields available in the laboratory. Here, laser spectroscopy is performed on hydrogen-like  $\text{Bi}^{82+}$  and lithium-like  $\text{Bi}^{80+}$  ions at about 70% of the speed of light. I will present the status of these experiments and provide an outlook for further studies on short-lived species and at higher accuracy.