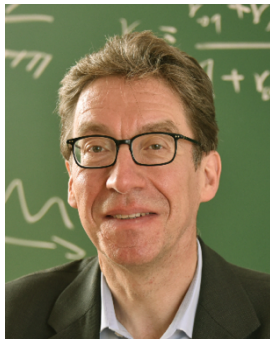
TECHNISCHE UNIVERSITÄT DRESDEN

School of Science Faculty of Physics

PHYSICS COLLOQUIUM

Speaker: **Prof. Ralf Röhlsberger**
Helmholtz Institut Jena



Topic: **Nuclear Resonances in Bright Light: Mössbauer Science with X-ray Lasers**

Time and place: Tuesday, June 20, 2023, **2:50 pm** – hybrid event
The colloquium will be held in REC/C213.
Online participation possible:
Zoom-Meeting: Meeting-ID: 631 3817 8900 / passcode: PK-SoSe23
https://tu-dresden.zoom.us/j/63138178900?pwd=RVVZM3N4azdmNmVJQ2RWUTZ0TkhXdz09

Host: Prof. Hans-Henning Klauss

Abstract: Synchrotron radiation had a profound impact on the applications of the Mössbauer effect in all natural sciences. The enormous brilliance of X-rays delivered by these sources enabled access to smallest amounts of materials under extreme conditions and allowed for studies with time resolution and polarization sensitivity that were virtually impossible in the lab. In this way it was even possible to transfer concepts of quantum optics into the regime of hard X-rays. This science field gained a further momentum by the advent of x-ray lasers. These sources deliver radiation pulses with peak brightness values to enter qualitatively new regimes in the interaction of light and matter. In this talk I will present the results of recent experiments at the European X-ray free electron laser (EuXFEL) in which we studied the Mössbauer effect under multiphoton excitation conditions. Moreover, we were able to excite the sharpest nuclear resonance line in the regime of hard x-rays, the 12.4 keV transition in Scandium-45 as a potential candidate for a nuclear clock.

Bio: Ralf Röhlsberger got his PhD in 1994 with a dissertation entitled 'Grazing Incidence Optics for Nuclear Resonant Filtering of Synchrotron Radiation'. After a Postdoc appointment at the Advanced Photon Source at Argonne National Lab until 1996, he moved back to Germany to accept academic positions at the University of Rostock and the Technical University of Munich. He then became senior scientist at Deutsches Elektronen-Synchrotron DESY in Hamburg in 2003 where he established a research group on magnetism and coherent phenomena. In parallel, he contributed to the construction of the synchrotron radiation source PETRA III and its nuclear resonant scattering beamline P01.

Since 2020 he holds a full professorship for X-ray Science at the University of Jena in common appointment with the Helmholtz Institut Jena. He is the elected Chair of the International Board on the Applications of the Mössbauer Effect (IBAME) since 2021.

Get-Together

The colloquium will be followed by a Get-Together with Prof. Ralf Röhlsberger in the room **REC/B101** (about 4:00 p.m.). **All students and staff** are invited to talk to the speaker and discuss perspectives on the academic career, work-life balance and the professional life as a professor.