

# Physikalisches Kolloquium



**Thursday, 06.12.2018, 16:15, HS 100**  
**Reception with coffee & cookies 15:45**  
 (For university staff: please bring your own cup for sustainability reasons)

**Prof. Dr. Stefan Eisebitt**, Max Born Institute for Nonlinear Optics and  
 Short Pulse Spectroscopy im Forschungsverbund Berlin e. V.:

## *Tickling Magnetization with Electrons and Light*

### Abstract

Nanometer magnetic domains oriented by magnetic fields are currently the dominating (mass) data storage technology. Alternatively, magnetic domains can be switched in their orientation by spin currents as well as by light pulses, suggesting novel approaches for future data manipulation and storage. Yet, our current understanding of many of the underlying fundamental mechanisms of these processes is far from complete. This is due to the fact that the systems showing appropriate magnetic functionality are typically complex and we have to study their static and dynamic properties over a range of relevant time- and lengthscales.

I will discuss some novel magnetic data storage concepts, such as the use of domains or skyrmions in racetrack memory (tickling with electrons/spins) and all-optical switching via laser pulses (tickling with light). Towards this end, the techniques allowing us to study magnetization dynamics with ultrafast temporal and nm spatial resolution are introduced. They make use of short "light" pulses over a wide spectral range from THz to x-rays in combination with spectroscopy, scattering and imaging. The focus is on the fundamental processes allowing to generate and manipulate chiral spin textures such as skyrmions and our quest to understand how and why magnetization can be switched with light pulses.

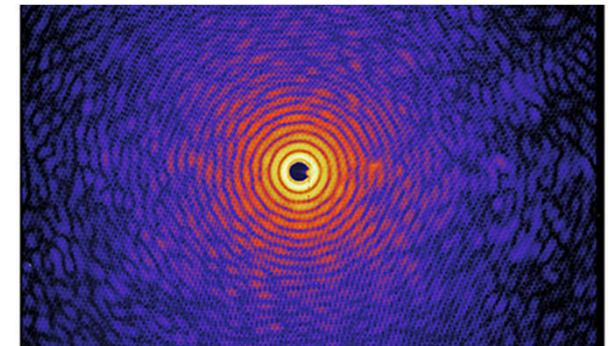


Photo: Dichroic X-ray holograms allow us to image nanometer-size magnetic domains and follow their dynamics.

All of you interested in physics are cordially invited!