

**Montag, 14.05.2018 um 16:15 Uhr**  
**Ort: Seminarraum 87, Wilhelm Klemm-Straße 10**

## When THz meets X-rays: An Ultrafast View on Magnetism

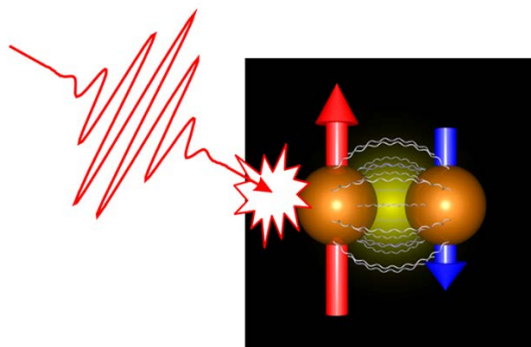


**Dr. Ilie Radu**

Max-Born Institute for Nonlinear Optics and Short Pulse Spectroscopy  
Berlin

The fundamental interactions and excitations governing magnetism and correlated matter occur on nanometer length-scales and femtosecond time-scales [1, 2]. Examples are phonons, magnons and electrons as well as their mutual interactions. A direct and selective excitation of these quasiparticles is possible with electromagnetic pulses at THz frequencies, whereas space-, element- and spin-resolved probing is provided by X-rays. Combining these two techniques will allow us to explore magnetic materials with unprecedented temporal, spatial and elemental resolution and to obtain quasiparticle-specific information, these being the key ingredients for understanding ultrafast magnetic phenomena.

Here, I will review the latest developments in our projects on ultrafast magnetism using both X-rays [3, 4] and THz radiation with a focus on magnetization switching phenomena.



### References

- [1] A. Kirilyuk, A. Kimel and Th. Rasing, *Rev. Mod. Phys.* **82**, 2731 (2010)
- [2] K. Carva, P. Balasz and I. Radu, *Handbook of Magnetic Materials* **26**, 291-463 (2017)
- [3] I. Radu et al, *Nature* **472**, 205-208 (2011)
- [4] I. Radu et al., *SPIN* **5**, 1550004 (2015)