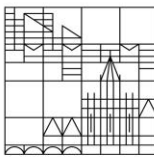


# Physikalisches Kolloquium

Universität  
Konstanz



Di 19.12.23

15:15 Uhr

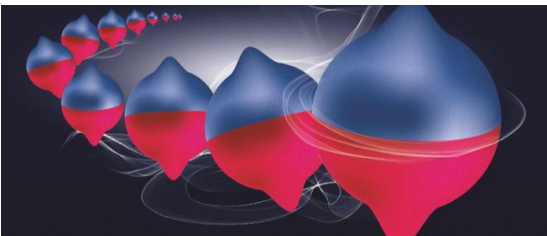
P 603

im Anschluss Getränke und Snacks



**Prof. Stefano Bonetti**  
Ca' Foscari University of Venice

## Terahertz surprises in condensed matter: nutating magnets and nonlinear phononics



The interaction between light and matter has been and is at the heart of the understanding of condensed matter physics. Historically, the development of previously unavailable light sources, extending both the achievable wavelength and brightness ranges, have greatly impacted fundamental research and eventually technology, such as for the case of the laser. In this talk, I will focus on coherent THz radiation of large amplitude, i.e. with electric fields of the order of 1 MV/cm and magnetic fields in the 0.1 – 1 Tesla range. Thanks to these novel light sources, we have recently been able to experimentally discover two novel and elusive phenomena in condensed matter: the evidence of magnetic "nutating", predicted over 10 years ago, and the observation of dynamical multiferroicity, i.e. of magnetic order coexisting with an electric polarization, recently proposed in literature, obtained by driving phonons in the nonlinear regime. I will discuss those two studies in detail. Finally, I will show some unpublished data where we have observed the excitation of a theoretically forbidden phonon mode, and of a previously unreported broad spectral feature. Both observations are intriguing and puzzling, and point towards novel opportunities of studying and controlling materials using intense terahertz radiation.

**Host:**  
**Dr. Bossini**

**Organisation:**  
**Prof. Bechinger**