UNIVERSITÄT LEIPZIG

Fakultät für Physik und Geowissenschaften

Prof. Dr. C. Schnohr
Prof. Dr. J. Vollmer

Physik-Kolloquium

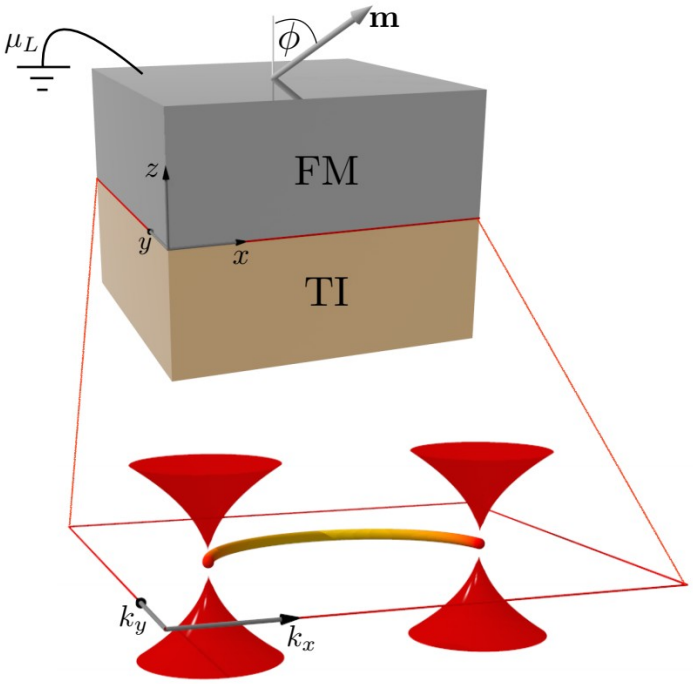
Tuesday, 03 November 2020 at 17.15

Prof. Dr. Jan Budich

Technische Universität Dresden

Exceptional Topology of Non-Hermitian Systems

In a broad variety of physical scenarios ranging from classical meta-materials to open quantum systems, non-Hermitian (NH) Hamiltonians have proven to be a powerful and conceptually simple tool for effectively describing dissipation. Motivated by recent experimental discoveries, a major focus of research has developed on investigating the topological properties of such NH systems. In this talk, we give an accessible overview of this rapidly growing field, and present our latest results. Specifically, we discuss the occurrence of novel gapless topological phases unique to NH systems. There, the role of spectral degeneracies familiar from Hermitian systems such as Weyl semimetals is played by exceptional points at which the effective NH Hamiltonian becomes non-diagonalizable. Furthermore, we show how guiding principles of topological matter such as the bulk boundary correspondence are qualitatively changed in the NH realm. Finally, we demonstrate that this sensitivity of NH systems to small changes in the boundary conditions may be harnessed to build novel high-precision sensors.



Venue: Hörsaal für Theoretische Physik, Linnéstraße 5