



IFMP Seminar

Date Monday, July 14, 2025, at 14:50

REC/C213

Zoom: 688 4227 2214, Passcode: IFMP2024-5

Speaker **Helmut Schultheiß**

HZDR

Title **Floquet magnons in a periodically-driven magnetic vortex**

Abstract Magnetic vortices are prominent examples for topology in magnetism with a rich set of dynamic properties. They exhibit an intricate magnon spectrum and show a special eigen-resonance of the vortex texture itself, the gyroscopic motion of the vortex core. While there have been studies about magnon-assisted reversal of the vortex core polarity, the impact of the vortex-core motion on the magnon spectrum wasn't addressed so far. These excitation types are clearly separated by one order of magnitude in their resonance frequencies, where magnons are in the lower-GHz range and the vortices typically gyrate at a few hundred MHz. This clear separation allows for experiments studying the temporal evolution of the magnon spectrum when the motion of the vortex core is driven by an external stimulus. We present experimental and numerical studies on how the magnon eigenstates are transformed into Floquet bands, when the vortex ground state is periodically modulated in time by the gyroscopic motion of the vortex core. The existence of the Floquet bands is evidenced by the appearance of magnon frequency combs, where the comb spacing is determined by the frequency of the gyroscopic motion.

Host: A. Singha