



Münchner Physik- Kolloquium

Sommer
2019

Broadband ferromagnetic resonance spectroscopy: The “Swiss Army Knife” for understanding spin-orbit phenomena

Dr. Justin M. Shaw, *National Institute of Standards and Technology, Boulder, Colorado, USA*

Monday, 3 June 2019, 17:15 h

Hörsaal 2, Physik-Department der TUM, James-Franck-Straße 1, Garching

Modern spin-based technologies rely on multiple, simultaneous phenomena that originate from the spin-orbit interaction in magnetic systems. These include damping, magnetic anisotropy, orbital moments, and spin-orbit torques. Recent advances in broadband and phase-sensitive FMR techniques have allowed to study these phenomena with improved accuracy and new measurement capability. In fact, broadband FMR techniques can now precisely measure spin-orbit torques at the thin-film level without the requirement of device fabrication. Broadband FMR measurements have also improved our fundamental understanding of magnetic damping. Numerous extrinsic relaxation mechanisms can obscure the measurement of the intrinsic damping of a material. This created a challenge to our understanding of damping because experimental data were not always directly comparable to theory. As a result of the improved ability to quantify all of these relaxation mechanisms, many theoretical models have been refined. In fact, this has recently led to both the prediction and discovery of new materials with ultra-low magnetic damping that will be essential for future technologies based on spintronics, magnonics, spin-logic and high-frequency devices.

Student event: Meet the speaker

We invite you to a **student-only** discussion-round with Dr. Justin M. Shaw before his Munich Physics Colloquium talk.

Be curious and feel free to ask any question.

Monday, 3 June 2019, 16:00 h,

Seminar room PH 3268 (upper floor), Physik-Department der TUM, James-Franck-Straße 1, Garching

