Einladung zum Physikalischen Kolloquium

12.11.2021  Patrick Maletinsky, Universität Basel
»Quantum sensing and imaging of magnetism on the nanoscale«

Einführung: D. Hunger

Quantum two-level systems offer attractive opportunities for sensing and imaging at the nanoscale. In the fifteen years since its inception, this idea [1] has advanced from proof of concept [2] to a mature quantum technology [3], which already finds applications in condensed matter physics, materials science and engineering. In this talk, I will present the key engineering challenges [4] we have addresses in this development and highlight particularly rewarding applications of single-spin, scanning probe microscopy. Specifically, I will discuss how we employ single electronic spins in diamond for nanoscale probing of antiferromagnetic systems [5-9] and high-resolution imaging of atomically thin “van der Waals” magnets [10,11]. For both, the combination of sensitivity, spatial resolution and quantitative imaging enables unprecedented insights such as quantitative imaging of nanoscale domains [8] and domain-walls [9] in antiferromagnets and nanoscale imaging of spin textures in magnetic systems down to the atomic monolayer limit [11]. I will conclude with an outlook of future developments of single spin magnetometers for extreme conditions, such as high magnetic fields, millikelvin temperatures or for high-frequency sensors to probe the dynamics of nanomagnetic systems.


Der Vortrag findet um 16:00 Uhr im Otto-Lehmann-Hörsaal, Physik-Flachbau (Geb. 30.22), statt. Bitte beachten Sie, dass das Betreten des Hörsaals nur unter Einhaltung der „3G-Regel“ erlaubt ist.