

Nanoscale Magnetic Imaging of Condensed Matter Systems using Diamond Spins

Ania Bleszynski Jayich
University of California Santa Barbara

The nitrogen vacancy (NV) center in diamond, an emerging quantum technology, is an atom-sized defect in diamond that is a remarkably good sensor of magnetic fields on the nanoscale. In this talk, I describe a novel, state-of-the-art magnetic imaging tool we have developed: we use a single NV spin sensor at the tip of a diamond scanning probe cantilever to image magnetic fields with nanoscale spatial resolution (6 nm) and high sensitivity ($3 \mu\text{T}/\text{Hz}^{1/2}$) at cryogenic temperatures. We have applied this tool to image vortices in an iron pnictide superconductor as well as topological defects in skyrmion-hosting systems.