

## ***Nanoscale Magnetic Imaging using Single Spins in Diamond***

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The nitrogen-vacancy (NV) center in diamond has emerged as an exceptional system for a variety of sensing applications in areas ranging from mesoscopic physics to materials science and biology. A single electronic spin localized to the NV defect is sensitive to physical quantities such as magnetic and electric fields, pressure, and temperature, and offers potentially atomic-scale spatial resolution with stable, robust operation over a wide temperature range. Our work focuses on magnetic imaging with an NV center embedded in a diamond AFM probe, which enables quantitative imaging of magnetic fields with a spatial resolution of tens of nanometers. I will present recent results in two materials systems: antiferromagnetic domains in  $\text{Cr}_2\text{O}_3$  films, and vortices in the superconductor  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ .