Colloquium

Quantum Sensing of Quantum Materials

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The magnetic fields generated by spins and currents provide a unique window into the physics ofcorrelated-electron materials and devices. Proposed only a decade ago, magnetometry based on theelectron spin of nitrogen-vacancy (NV) defects in diamond is emerging as a platform that isexceptionally suited for probing condensed matter systems: it can be operated from cryogenictemperatures to above room temperature, has a dynamic range spanning from DC to GHz, andallows sensor-sample distances as small as a few nanometers. As such, NV magnetometry providesaccess to static and dynamic magnetic and electronic phenomena with nanoscale spatial resolution.While pioneering work focused on proof-of-principle demonstrations of its nanoscale imagingresolution and magnetic field sensitivity, now experiments are starting to probe the correlated-electron physics of magnets and superconductors and to explore the current distributions in low-dimensional materials. In this talk, I will review some of our recent work that uses NV centermagnetometry to image skyrmions in thin magnetic films, measure the spin chemical potential inmagnetic insulators, and image hydrodynamic electron flow in layered materials.

Monday, November 23, 2020 04:00pm - 05:00pm
Online on Zoom

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.