ICFO

SEMINAR: Imaging modalities for multifunctional quantum scanning microscopy

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Blue Lecture Room

The remarkable quantum properties of the nitrogen-vacancy (NV) center in diamond have led to the creation of quantum sensing platforms capable of sensitive and nanoscale magnetic field measurements. One prominent quantum sensing platform is scanning NV microscopy, where a single NV center is scanned above a sample using atomic force microscopy to simultaneously image magnetic fields and sample topography. In this talk, I will present some recent developments that improve and expand the scanning NV toolbox. This includes detection schemes based on AC dynamical decoupling which improve sensitivity, as well as a multiplexed detection scheme that enables covariance measurements. These improvements led to the direct imaging of room-temperature electron hydrodynamics in graphene, the magnetic characterization of antiferromagnetic atomic steps, and the first non-perturbative electric field imaging of ferroelectric domains. Collectively, these examples demonstrate the broad scope of samples, devices, and nanoscale phenomena that can be explored with scanning NV microscopy.

Hosted by: Prof. Dr. Frank Koppens