Biomolecular sensing with quantum sensors

There is a growing global effort to harness the distinctive properties of quantum physics for transformative advances in metrology, computing, and communication—commonly referred to as the pursuit of “engineered quantum systems.” Among the leading contenders in this field are diamond color centers, especially nitrogen-vacancy (NV) centers, which enable ultra-sensitive magnetometry and hold the potential for nanoscale magnetic resonance imaging (MRI) of individual complex biomolecules. In this talk, I will share our recent progress toward developing an imaging platform for tracking mimicked neuronal activity, along with our efforts to engineer localized quantum sensors capable of detecting biomolecular signals.