

MATERIALS SCIENCE AND ENGINEERING GRAD STUDENT SEMINAR

Interfacing Novel Quantum Systems with Superconducting Circuits

Friday, October 23
2:30PM
IRCB 1030

Xianjing Zhou, Ph.D.

ASSISTANT PROFESSOR
Department of Mechanical & Aerospace Engineering

ABSTRACT: Solid-state quantum systems offer promising opportunities for quantum information processing by combining long quantum coherence times with the scalability and versatility of engineered devices. In this talk, I will present our recent experimental progress on two emerging quantum systems: electrons trapped on solid neon and individual rare-earth spins in oxide crystals.

In the first part, I will introduce the electron-on-neon platform, where single electrons are trapped above the surface of solid neon and coupled to superconducting microwave resonators. In the second part, I will discuss the detection and coherent characterization of individual rare-earth spins in calcium tungstate (CaWO_4) using superconducting nanowire resonators. By combining strong microwave confinement with the enhanced coherence near a magnetic clock transition, we achieve single-spin detection with cooperativity exceeding 15 and observe coherence times reaching the millisecond regime.



This event is sponsored by FAMU-FSU College of Engineering and
Department of Materials Science and Engineering

