UCI Samueli School of Engineering

Department of Materials Science and Engineering UCI

UNIVERSITY OF CALIFORNIA, IRVINE

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

IS PROUD TO HOST A SEMINAR BY

"PHOTON SOURCES AND SPIN QUBITS BASED ON LOW-DIMENSIONAL SEMICONDUCTORS"

XUEDAN MA

ASSOCIATE PROFESSOR
DEPARTMENT OF MATERIALS SCIENCE AND NANOENGINEERING
RICE UNIVERSITY

Thursday, May 7, 2026

2:00 PM - 3:20 PM

McDonnell Douglas Engineering Auditorium

Abstract: Quantum photon sources and electronic spin qubits are two of the most ubiquitous and essential building blocks of hybrid quantum networks. Optical photons are ideal information carriers for communication and memory applications due to their long coherence times and their ability to travel over long distances. Electronic spins, in contrast, are natural candidates for qubits, as their states can be efficiently initialized and coherently controlled.
In this talk, I will present our recent efforts in developing solid-state quantum photon sources and electronic spin qubits based on low-dimensional semiconductor materials. Leveraging the versatility of low-dimensional systems, we demonstrate wavefunction engineering as an effective approach for tailoring the emission properties of quantum photon sources. I will also discuss our exploration of electronic spin qubits and tunability of spin states using self-assembly structures.

Bio: Dr. Xuedan Ma is an Associate Professor in the Department of Materials Science and NanoEngineering at Rice University. Prior to joining Rice University, she was a Scientist in the Nanoscience and Technology Division at Argonne National Laboratory, a Senior Scientist in the Pritzker School of Molecular Engineering at the University of Chicago, and a Fellow of the Northwestern-Argonne Institute of Science and Engineering at Northwestern University.
Her research focuses on applying advanced spectroscopic methods to investigate semiconducting and magnetic materials, with an emphasis on their electronic structures under external stimuli across diverse light-matter interaction regimes. Her research group also develops novel spectroscopic and microscopic techniques for the detection and characterization of individual nano-objects.