University of California, Irvine

THE DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

MSE 298 SEMINAR

FALL 2025: MSE IN THE SPOTLIGHT

Assitant Professor
Qi Song
Materials Science and Engineering

RESEARCH TALK:
LOW-DIMENSIONAL QUANTUM MATERIALS DESIGN THROUGH ATOMICALLY PRECISE FILM SYNTHESIS

SHORT CAREER TALK:
EVERYTHING HAPPENS FOR THE BEST

Abstract: Low-dimensional quantum materials are at the forefront of scientific exploration due to their extraordinary electronic and magnetic characteristics, distinct from those observed in bulk systems. Among the various synthesis techniques,Molecular-beam epitaxy (MBE) emerges as a leading technique for developing these innovative materials. This thin-film deposition approach enables precise engineering of quantum materials, unlocking fascinating properties such as superconductivity, quantum magnetism, and topological states. In this talk, I will discuss how to utilize MBE, along with characterization tools such as angle-resolved photoemission spectroscopy (ARPES) and resonant x-ray scattering (RXS), to unveil a completely new antiferromagnetic (AFM) metal phase in transition metal oxide nickelate. Additionally, I will cover the exploration of the superconductivity in nickelates and iron-based chalcogenide.

Bio: Qi Song is currently an Assistant Professor in the Department of Materials Science and Engineering at UC Irvine. Song received her Ph.D. in Physics from Fudan University in China, during which she participated in a collaborative program at MIT as a visiting student. She then pursued postdoctoral research in the Department of Physics at Harvard University, followed by a postdoctoral position in the Department of Materials Science and Engineering at Cornell University in 2020.
At UCI, Qi's research focuses on the discovery and development of novel low-dimensional quantum materials, where every atom holds the potential to unlock profound quantum phenomena. Her group employs molecular beam epitaxy (MBE) to precisely engineer material structures and tune their chemical potential, enabling and enhancing extraordinary behaviors such as superconductivity and quantum magnetism.
https://songlab.eng.uci.edu/

DATE: Thursday, October 9, 2025
TIME: 2:00 - 3:20 PM
LOCATION: McDonnell Douglas Engineering Auditorium