UCI Samueli School of Engineering

Center for Complex and Active Materials
UCI MRSEC

UNIVERSITY OF CALIFORNIA, IRVINE

DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING

SPECIAL SEMINAR

"LOW-DIMENSIONAL QUANTUM MATERIALS DESIGN THROUGH ATOMICALLY PRECISE FILM SYNTHESIS"

QI SONG

POSTDOCTORAL SCHOLAR
CORNELL UNIVERSITY

Tuesday, April 9, 2024

2:00 - 3:30 PM

Engineering Tower, Conference Room 652

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. I will also share my vision and effort in pushing the boundaries of the MBE technique to further explore novel low-dimensional quantum materials.

Bio: Qi Song is currently a postdoctoral scholar in the Department of Material Science and Engineering at Cornell University. She earned her Ph.D. in Physics from Fudan University in China, and then spent two years as a Postdoc Scholar at Harvard University before joining Cornell. Her research is centered around the exploration of low-dimensional quantum materials through molecular beam epitaxy (MBE) assisted by spectroscopy characterization.