



北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Probing Quantum Materials by X-ray Scattering Spectroscopy

Yingying Peng

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Time: 10:00am, Nov.24 2025 (Monday)

时间: 2025年11月24日 (周一) 上午10:00am

Venue: Room w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Understanding how complex electronic orders emerge and compete in quantum materials is central to condensed matter physics. Resonant X-ray scattering spectroscopy, by combining momentum resolution, element sensitivity, and ultrafast time resolution, enables direct access to symmetry breaking, competing orders, and collective excitations in strongly correlated materials. In this seminar, I will present an overview of our group's studies on quantum materials using advanced X-ray scattering techniques. I will highlight two representative examples enabled by resonant scattering: charge order in cuprate superconductors and electronic chirality in 1T-TiSe₂, discussing both their static properties and nonequilibrium, photoinduced dynamics. I will conclude with perspectives on how next-generation X-ray methods can further uncover and control emergent quantum states in complex materials.

About the speaker

Yingying Peng is an Assistant Professor at the International Center for Quantum Materials, Peking University, China. Her research focuses on uncovering the mechanisms of high-temperature superconductivity and emergent quantum phenomena in strongly correlated materials, using advanced X-ray spectroscopic techniques such as resonant inelastic and elastic X-ray scattering. She has contributed to developing cutting-edge instrumentation, including the high-resolution RIXS spectrometer at the European X-ray Free Electron Laser. She has also contributed to understanding charge, spin, orbital, and lattice excitations in unconventional superconductors. She has authored over 70 peer-reviewed publications, including articles in Science, Nature family journals, and Physical Review Letters, with more than 6,000 citations.