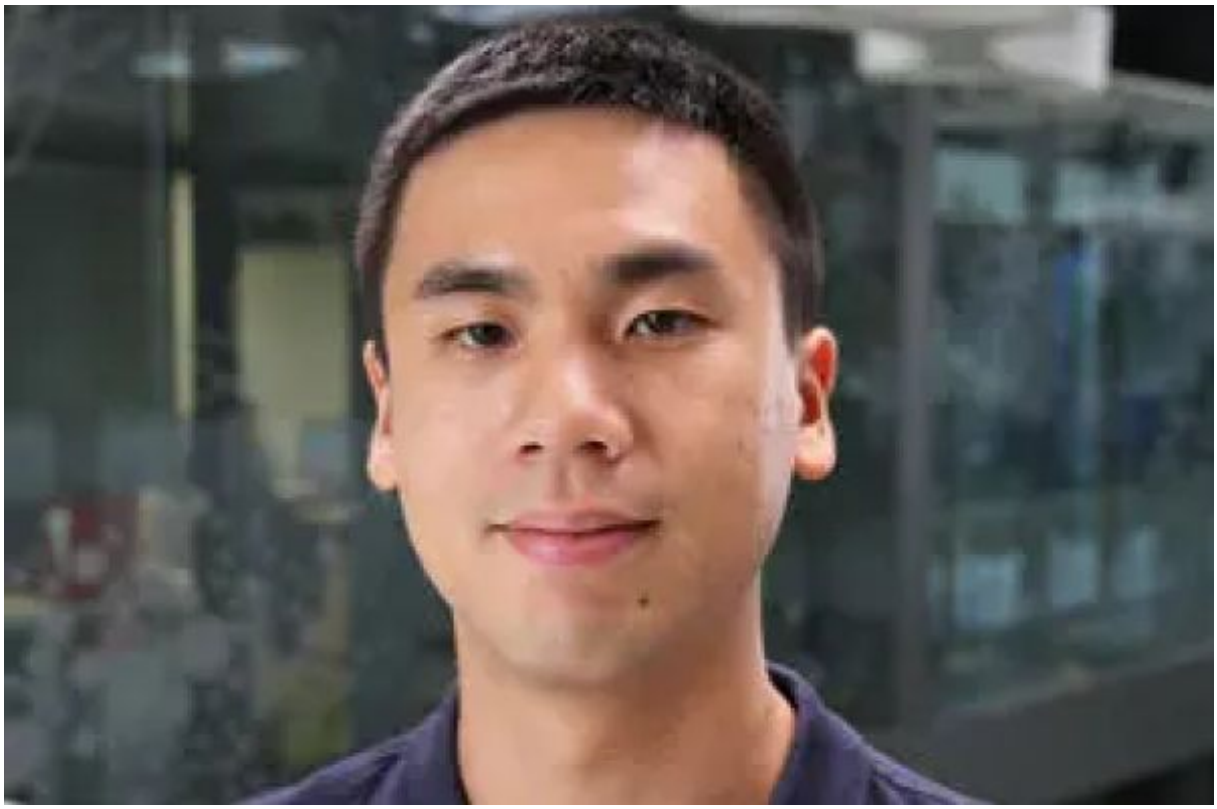


PhD THESIS DEFENSE: X-ray absorption fine structure with attosecond soft X-ray pulses for condensed matter physics

HUNG-WEI SUN

November 11, 2024

10:00

ICFO Auditorium

Understanding electron behavior in solids and their interactions with the lattice is crucial for exploring exotic phenomena in condensed matter. Traditional techniques often provide limited insights, focusing on either carriers or lattice structures independently. In contrast, X-ray absorption spectroscopy can simultaneously measure electrons and phonons, especially with the broadband continuum soft X-ray spectrum generated through high harmonic generation, facilitating simultaneous electron and phonon physics exploration. However, the strong absorption by solid-state samples necessitates extended measurement times. This thesis introduces the upgrades to the laser system and the attosecond soft X-ray

beamline at ICFO, which enhance the detectable photon flux and improve the spectral resolution of the soft X-ray spectrograph. These advancements allow for detailed investigations of phase transition phenomena in materials such as Titanium diselenide (TiSe?), providing an exceptional tool for understanding material properties at the microscopic level and paving the way for more precise studies of dynamic processes in condensed matter.

Monday November 11, 10:00 h. ICFO Auditorium

Thesis Director: Prof. Dr. Jens Biegert

Hosted by: Academic Affairs