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Congratulations to New ICFO PhD Graduate

Dr. Hung-Wei Sun graduated with a thesis entitled i¿½X-r y absorption fine structure with attosecond soft X-ray pulses f r condensed matter physicsi¿½

November 11, 2024

We congratulate Dr. Hung-Wei Sun who defended his thesis this morning in ICFO's Auditorium.
Dr. Sun obtained his MSc in Science at the National Tsing Hua University in Taiwan before joining the Attosecond and Ultrafast Optics research group led by ICREA professor at ICFO Dr. Jens Biegert. His thesis titled i¿½X-ray absorption fine structure with attosecond s ft X-ray pulses for condensed matter physicsi¿½ was supervised by Prof. Jens Bie

ABSTRACT:

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.

Thesis Committee:
Dr. Oliver Chalus, THALES OPTRONIQUE S.A.
Prof. Dr. Carmen Rubio Verdu, ICFO

ICFO

Dr. Matthias Baudisch, APE-BERLIN

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Attosecond and Ultrafast Optics group