



Photo-induced hidden states in quantum materials: from high-T_c superconductor to colossal magnetoresistant materials

Date: November 8, 2023 (Wednesday)

Time: 4:00 p.m.

Venue: MB237, Main Building, HKU



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Abstract:

In quantum materials, exotic quantum states can emerge as a result of strong many-body interaction that are of charge, magnetic, orbital and structural origins. The delicate balance among these interacting degrees of freedom engenders not only a ground state, but also many other competing metastable states with distinct macroscopic properties. Despite static tuning methods, the rapidly developing ultrafast science has now made it possible to dynamically control quantum materials at an unprecedented level, that is, the direct manipulation of elementary excitations at their fundamental time and energy scales. Here, we show examples on how ultrafast laser excitation can lead to enhanced superconductivity in copper oxide and unconventional superconductors. The other example is shot-by-shot laser control of hidden metastable states in manganite thin films, evidenced by combined methods of ultrafast terahertz spectroscopy, scanning near-field microscopy and X-ray scattering.

Biography:

Dr. Jingdi Zhang received B.S. at University of Science and Technology of China and Ph.D. in Physics at Boston University. He then moved to La Jolla, California and worked as a postdoctoral fellow at UC San Diego before joining the faculty of HKUST Physics in 2019. He is interested in dynamic control of quantum materials and metamaterials through light-matter interaction as well as developing novel spectroscopic tools, particularly at THz frequencies.

Anyone interested is welcome to attend!

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