

Nebraska Center for Materials and Nanoscience

2017 Fall Seminar Series

Dr. Jigang Wang

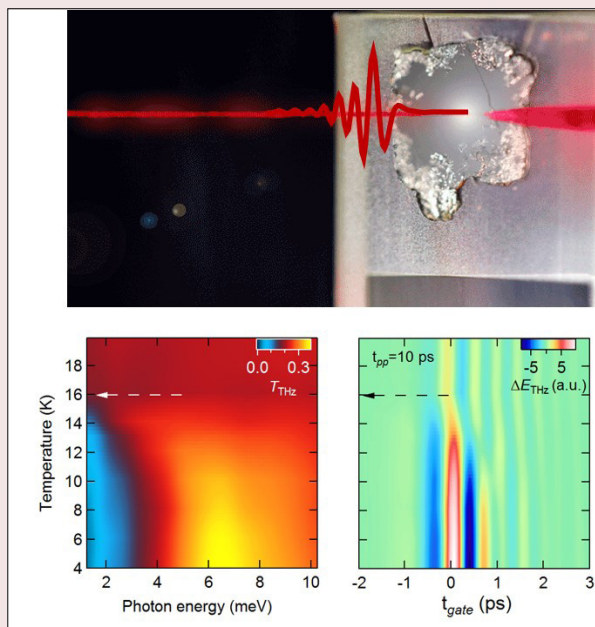
Department of Physics and Astronomy
Professor, Iowa State University

Non-Equilibrium Materials Discovery: Terahertz Light-Quantum-Tuning of Hidden Electronic Phases

Observation of “sudden” quantum quench of dominant phases without heating of other degrees of freedom in the system can provide transformative opportunities for accessing and controlling new, thermodynamically forbidden, phases of matter. These states are not accessible by traditional adiabatic tuning methods: chemical substitution, temperature, pressure, or magnetic field that reach exotic phases, often with serendipity, via spontaneous coherence.

In his talk, Dr. Wang will discuss several examples using terahertz (THz) light-matter coherence for non-adiabatic

Hamiltonian design in superconductors, which expose new phases and collective modes hidden in equilibrium by the dominant competing SC order. Finally, he will present the outlook for applying the THz quantum control strategy in topological insulators and spectroscopy nano-imaging. The insights obtained have clear implications for the entire field of emergent materials phase discovery and manipulation across correlated electron matter, unconventional superconductivity, topologically-nontrivial materials, and nano-electronics.



Jigang Wang is currently a full professor in the Department of Physics and Astronomy at Iowa State University and a staff scientist in the Ames laboratory of the US Department of Energy. He received his Ph.D. from Rice University at 2005 and joined Lawrence Berkeley National Laboratory as a postdoctoral fellow from 2005-2008. His research is broadly concerned with non-equilibrium quantum dynamics and ultrafast spectroscopy nano-imaging of complex materials. He is a recipient of the NSF CAREER award and a lead PI in the M. W. Keck Initiative on Quantum Microscopy.



October 25 | 4 p.m. | 136 Jorgensen Hall
Refreshments in 1st floor vending area at 3:45 p.m.

Host: Xiaoshan Xu
Department of Physics and Astronomy

