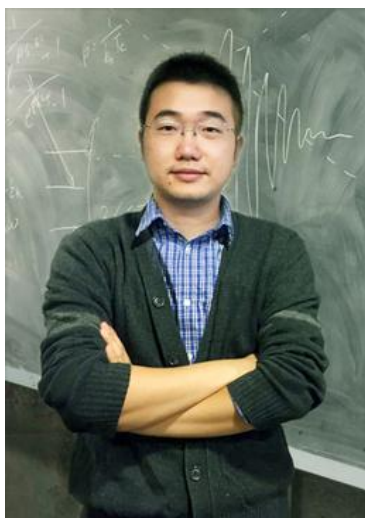




Explore Strongly Correlated Electron Materials with Advanced IR and THz Spectroscopy



Prof. Mengkun Liu

Stony Brook University, United States

Time: 2:00pm, July 27, 2016 (Wednesday)

时间: 2016年7月27日 (周三) 下午14:00

Venue: w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

In strongly correlated electron materials (CEMs), the delicate interplay between spin, charge, and lattice degrees of freedom often leads to extremely rich phase diagrams exhibiting intrinsic phase inhomogeneities. The key to studying and disentangling such complexities usually lies in the characterization and control of these materials at fundamental energy, time and length scales. I will use this opportunity to report the recent advances in the IR and THz spectroscopy and explain how they can be used to probe electronic/structural phase transitions with unprecedented spatial and temporal resolutions. Specifically, with scanning near-field infrared microscopy we resolved the insulator to metal phase transitions with ~ 10 nm resolution over a broad spectral range. Using ultrafast terahertz pump terahertz probe spectroscopy we can unambiguously demonstrated the insulator to metal transition at picosecond time scales via electric field-induced electron liberation. These results set the stage for future spectroscopic investigations to access the fundamental properties of complex materials.

About the Speaker

Mengkun Liu (Ph.D. 2012 Boston University) is an assistant professor at the Physics Department of Stony Brook University (since 2015). His post doc research is at UC San Diego from 2012-2014. His research interests include: physics of correlated electron systems, two-dimensional materials, infrared nano-optics and ultrafast time domain spectroscopy. Prizes include Seaborg Institute Research Fellowships at Los Alamos National Lab.