



Liuyan Zhao

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Venue: Room M212, Physics Building, Peking University

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Abstract

Iridium oxides are electronic systems that combine two central threads of modern quantum materials research - correlated electron physics that underlies phenomena such as high- T_c superconductors, and spin-orbit physics that describes systems such as topological insulators. The perovskite iridate Sr_2IrO_4 is of particular interest owing to its remarkable analogy to high- T_c cuprates, including its striking structural and electronic similarities to the cuprate parent compound La_2CuO_4 and recent observations of pseudogap and d -wave gap behaviors upon doping. In this talk, I will describe the nonlinear optical spectroscopy and microscopy techniques that we developed recently to identify unconventional multipolar ordered phases. I will show the experimental evidences for an odd-parity non-dipolar ordered phase in both undoped and hole-doped Sr_2IrO_4 , and discuss the potential relevance of this novel phase to pseudogap and superconductivity in both Sr_2IrO_4 and high- T_c cuprate $\text{YBa}_2\text{Cu}_3\text{O}_y$.

About the Speaker

Liuyan Zhao received her B.S. degree from USTC and Ph.D. degree in Physics from Columbia University. During her thesis work, she used scanning tunneling microscope and spectroscopic methods to characterize and control chemical doping in monolayer graphene with atomic precision. She is currently a Prize Postdoc Fellow in Experimental Physics at Caltech, where she is developing new spectroscopic imaging methods to detect novel electronic order in correlated materials and high-temperature superconductors. Starting from 2017, she will join the University of Michigan as an Assistant Professor in Physics.