北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Weekly Seminar

Correlated electron systems with strong spin-orbit coupling --- ARPES studies on iridates

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Time: 4:00pm, Nov. 11, 2020 (Wednesday)

时间: 2020年11月11日 （周三）下午4:00

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼，西563会议室

Abstract

Many emergent quantum phenomena may appear when spin-orbit coupling and electron correlation coexist in a material system. Prominent examples in this class of materials are iridates. In this talk, I will mainly focus on Ruddlesden-Popper iridates (Sr_2IrO_4 and $Sr_3Ir_2O_7$). On one hand, the cooperation between spin-orbit coupling and on-site Coulomb interaction gives rise to a "J_{eff} =1/2" Mott state, which serves as a unique platform to investigate the universality of many exotic phenomena seen in cuprates. On the other hand, the strong spin-orbit coupling and moderate electron correlation would also drive exotic quantum states that are unique to this group of materials. Finally, I will expand the discussion to several different types of iridates.

References:

Yong Hu and J.-F. He* et al., "Spectroscopic evidence for electron-boson coupling in electron-doped Sr_2IrO_4". Physical Review Letters 123, 216402 (2019).

Shuting Peng and J.-F. He* et al., "Electronic nature of the pseudogap in electron-doped Sr_2IrO_4". Under review (2020).

J.-F. He et al., "Spectroscopic evidence for negative electronic compressibility in a quasi-three-dimensional spin-orbit correlated metal". Nature Materials 14, 577-582 (2015).

About the speaker

何俊峰，中国科学技术大学特任教授，博士生导师。2013年在中科院物理所获得凝聚态物理博士学位，2013-2015年在波士顿学院从事博士后研究，2015-2018年在斯坦福大学从事博士后研究。2018年担任日本广岛大学客座教授。主要从事量子材料的电子结构研究，在包括Nature，Science，Nature Materials，Science Advances，PRL，PNAS，Nature Communications等国际重要学术期刊上发表论文40余篇。