



Seminar

Exotic phase transitions discovered via ARPES and precise sample manipulation

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Venue: Room W563, Physics Building, Peking University

地点: 北京大学物理楼 西563



Abstract

Angle-resolved photoemission spectroscopy (ARPES) has been developed into a powerful technique to study quantum materials. To further improve its capability, we put forwards an “ARPES+N” technique which adapts ARPES to various in-situ sample tuning techniques. By doing this, electronic state manipulating and probing can be done simultaneously in our ARPES system. In this talk, I will show you few examples of how our “ARPES+N” techniques could help us to discover new exotic phase transitions in “old” well-studied materials. This includes the discovery of Band-insulator-to-Mott-insulator transition in 1T-TaS₂, the discovery of exotic metal-to-insulator transition in 2H-MoTe₂, the discovery of doping-controlled transition from excitonic-insulator to semi-metal in Ta₂NiSe₅, the discovery of nematic superconducting phase in Ba_{1-x}K_xFe₂As₂, etc. The future directions of ARPES will also be discussed.

About the Speaker

Dr. Yan ZHANG works as an assistant professor in the International Center for Quantum Materials, School of Physics, Peking University since 2014. He received his Ph. D in Fudan University in 2012 and worked as a postdoc in Stanford University from 2012 to 2014. His research interest is in utilizing the angle-resolved photoemission spectroscopy (ARPES) and in-situ sample tuning techniques to study novel electronic phases in quantum materials. He has published 60 papers in Nature Physics, Nature Materials, PRL, PRB, etc. The topics of his research include high-T_c superconductivity, topological materials, low-dimensional materials, strongly-correlated materials, etc.