北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Pursuing novel electronic states in two-dimensional chalcogenides, perovskite oxides, and their heterostructures

Ke Zou

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Time: 10:00am, April 9, 2018 (Monday)

时间：2018年4月9日 （周一）上午10:00

Venue: Room W563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

Realizing enhanced or novel electronic states in two-dimensional transition metal chalcogenides and perovskite oxides with atomic thickness, which result from reduced dimensionality and interfacial interactions with the nearby substrate, is of great interest from both fundamental and technological perspectives. AT UBC, we employ a dual- molecular beam epitaxy system, capable of synthesizing both materials and their heterostructures with atomic-scale precision. Two examples showing we achieve enhanced superconductivity in monolayer FeSe and transport through topological surface states in SnTe, respectively, will be presented in the seminar. We determine the surface structure of $SrTiO_3$ that is used to achieve superconducting FeSe films in experiments. The existence of a double TiO_2 layer helps to transfer electrons to FeSe films, and leads to a band structure characteristic of superconducting samples. In topological crystalline insulator SnTe, we find that the surface-state carriers are buried and protected from depletion at the SnTe/$SrTiO_3$ interface and dominate the measured conductance at thicknesses smaller than 40 unit cells.

About the speaker

Dr. Ke Zou is an Assistant Professor in the Department of Physics and Astronomy & Stewart Blusson Quantum Matter Institute at the University of British Columbia. His group at UBC is currently recruiting motivated candidates of postdoctoral fellows and graduate students. He was a Postdoctoral Associate in the Department of Applied Physics at Yale University. He received his Ph.D. in Physics from the Pennsylvania State University in 2012, and his B.S. in Materials Physics from University of Science and Technology of China in 2006.