



Seminar

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

Ke Zou

Department of Physics and Astronomy & Stewart Blusson Quantum Matter

Institute, University of British Columbia



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

2018 4 9

10:00

Venue: Room W563, Physics building, Peking University

563

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 SrTiO₃ that is used to achieve superconducting FeSe films in experiments. The existence of a double TiO₂ 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/SrTiO₃ interface and dominate the measured conductance at thicknesses smaller than 40 unit cells.

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.