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Topological quantum states visualized by ARPES: From topological kondo insulator to Weyl semimetal

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Recently, topological classifications of quantum phases have been extended from non-interacting insulators to strongly correlated insulators, and further to semimetals. In this talk, I will introduce our recent results on direct visualizations of several topological quantum states with angle-resolved photoemission spectroscopy (ARPES), including:

- The direct observation the metallic surface states on strongly correlated Kondo insulator SmB₆ and its helical spin texture of as compelling evidences for the predicted topological kondo insulator.
- Direct observation of 3D Weyl cones in the bulk states of topological semimetal TaAs, as experimental evidence of Weyl semimetal states.
- Discovery simple Weyl semimetal TaP, where only single type of Weyl fermions contributing the exotic transport properties.
- Observation of Fermi arc states in MoTe₂ as evidence of type-II Weyl semimetal state.

Biography

Nan Xu has completed his PhD in 2013 from Institute of Physics, Chinese Academy of Sciences, working with Prof. Hong Ding. Afterwards, he conducted his Postdoctoral studies at Swiss Light Source, Paul Scherrer Institut in 2013-2015 working with Prof. Ming Shi, and with Prof. Joel Mesot at Ecole Polytechnique Federale de Lausanne (EPFL) from 2015 to now. His academic interests are using angle-resolved photoemission spectroscopy to study the strongly correlated systems and novel quantum states. He has published 35 papers (including 1 invited review article) in reputed journals over past 5 years, and been invited speaker in more than 6 international conferences.

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