



Seminar

The Route to Pure Dissipationless Quantum Anomalous Hall State

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Time: 4:00pm, June 23, 2015 (Tuesday)

时间: 2015年6月23日 (周二) 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

Quantum anomalous Hall (QAH) effect, the last member of Hall family, was predicted to occur without the external magnetic field. The QAH effect shares a similar physical phenomenon as the integer quantum Hall (QH) effect, whereas its physical origin relies on the intrinsic topological inverted band structure and ferromagnetism. Since the QAH effect does not require an external field and the associated Landau levels, it is believed that this effect has unique potential for applications in electronic devices with low-power consumption. More recently, the QAH effect has been experimentally observed in thin films of the time reversal symmetry breaking ferromagnetic topological insulators (FMTI), Cr- and V- doped $(\text{Bi,Sb})_2\text{Te}_3$ [1, 2]. In this talk, we will introduce the route to the experimental observation of the QAH effect in these two systems, and discuss the zero magnetic field dissipationless edge mode and the origin of the dissipative channels in the high-precision QAH state of V-doped $(\text{Bi,Sb})_2\text{Te}_3$ [2,3].

References

- [1] Cui-Zu Chang et al, *Science* 340, 167(2013).
- [2] Cui-Zu Chang et al, *Nature Materials* 14, 473(2015).
- [3] Cui-Zu Chang et al, *Physics Review Letters* (2015) (in press).

About the speaker

Cui-Zu Chang is currently a postdoc associate in Massachusetts Institute of Technology (MIT). He received his BS degree in Optical Engineering from Shandong University (China, 2007), and Ph.D degree in Condensed Matter Physics from Tsinghua University (China, 2013). His research interest includes the area of quantum anomalous Hall (QAH) effect, interface superconductivity, triplet superconductivity and tunneling junctions. He is a worldwide well-known and leading young expert in the rapidly developing field of QAH effect and topological insulators. He has published more than 25 papers. As the first or a corresponding author, he published 2 in *Science*, 1 in *Nature Mater.*, 5 in *Phys. Rev. Lett.*, 1 in *Nature commun.*, 1 in *Adv. Mater.*, and 1 in *Nano Lett.*. He has given four invited talks including 2 in APS March Meeting, and tens of contributed oral talks and seminars. He also holds several awards including the Switzerland Dimitris N. Chorafas Foundation Award (2013).