



Seminar

Superconducting States in Doped Topological Materials



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Time: 4:00pm, Nov. 20, 2014 (Thursday)

时间: 2014年11月20日 (周四) 下午4:00

Venue: Conference Room 607, Science Building 5

地点: 理科五号楼607会议室

Abstract

There are considerable interests in topological superconductivity in condensed matter physics. In this talk, I will present our recent works on topological superconductors and the related phenomena. In particular, I will discuss how topological non-trivial structures in normal states may arise non-trivial quantum phenomena in the superconducting states. As examples, I will discuss odd parity superconductors [1], superconducting states in Cu-doped Bi₂Se₃[2, 3], and doped Weyl semi-metal[4]. In the latter two cases, I will show that topological surface states in the normal states give rise to novel topological quantum phenomena in superconducting states.

[1] M. Sato, Phys. Rev. B81, 220504(R) (2010)

[2] A. Yamakage, K. Yada, M. Sato, Y. Tanaka, Phys. Rev. B85, 180509(R)

[3] T. Mizushima, A. Yamakage, M. Sato, Y. Tanaka, arXiv:1311.2768.

[4] L. Bo, K. Yada, M. Sato, Y. Tanaka, arXiv:1406.3804.

About the Speaker

Prof. Masatoshi Sato received his Ph.D in 1996 in Department of Physics, Kyoto University. From 1996 to 1997 and from 1997 to 1999, he worked as postdoctoral fellow and JSPS Fellow in Kyoto University and University of Tokyo, respectively. Between 1999 and 2007 he worked as a research associate in Institute of Solid State Physics, University of Tokyo, and after 2007 he became an assistant professor in the same institute until Jun 2012 when he joined as an associate professor the faculty of department of applied physics, Nagoya University. Currently Prof. Sato focuses his research on topological materials including topological superconductors and topological insulators. He made important theoretical contributions to topological superconductors, particularly in realizing non-Abelian Majorana modes through an s-wave pairing order in the presence of Rashba spin-orbit coupling and Zeeman field.