



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

物理学学术报告 Physics Seminars (biweekly)

Title: Interacting surface states of topological insulators

Speaker: Joseph Maciejko (*University of Alberta*)

Time: 4:00pm, Wednesday, Jan 6, 2016
(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: Conference Hall 322, Science Building, Tsinghua University

Abstract

The standard theory of topological insulators ignores electron-electron interactions, which are nevertheless present to some degree in all topological insulator materials. In this talk I will discuss extensions of this theory to describe the effects of electron-electron interactions on the topological surface states of 3D topological insulators. First, I will describe an extension of the phenomenological Landau theory of Fermi liquids to the surface states of 3D topological insulators, leading to the concept of helical Fermi liquid. Second, I will present exact results for certain transport properties of the topological surface states at a strongly interacting quantum critical point for a continuous transition between a Dirac semimetal and a superconductor.