



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

学术报告

- Title:** Dirac vs. Weyl in topological insulators: Adler-Bell-Jackiw anomaly in transport phenomena
- Speaker:** Prof. Ki-Seok Kim
(*Department of Physics, POSTECH, Korea*)
- Time:** 3:30pm, Wednesday, Dec. 18, 2013
- Venue:** Conference Hall 322, Science Building, Tsinghua University

Abstract

Dirac metals (gapless semi-conductors) are believed to turn into Weyl metals when perturbations, which break either time reversal symmetry or inversion symmetry, are employed. However, no experimental evidence has been reported for the existence of Weyl fermions in three dimensions. Applying magnetic fields near the topological phase transition from a topological insulator to a band insulator in $\text{Bi}_{1-x}\text{Sb}_x$, we observe not only the weak anti-localization phenomenon in magnetoconductivity near zero magnetic fields ($B < 0.4$ T) but also its upturn above 0.4 T only for $E \parallel B$. This “incompatible” coexistence between weak anti-localization and “negative” magnetoresistivity is attributed to the Adler-Bell-Jackiw anomaly (“topological” term) in the presence of weak anti-localization corrections.