清华大学高等研究院

Institute for Advanced Study, Tsinghua University

物理学术报告

Physics Seminars (biweekly)

Title: **Discrete scale invariance and Efimov bound states in Weyl systems with coexistence of electron and hole carriers**

Speaker: **Haiwen Liu** ***(Beijing Normal University)***

Time: **4:00pm, Wednesday, April 19, 2017**
(3:30~4:00pm, Tea, Coffee, and Cookie)

Venue: **Conference Hall 322, Science Building, Tsinghua University**

Abstract

In this talk, I will discuss that both the two-body Weyl Hamiltonian with Coulomb attraction and the three-body Schrödinger Hamiltonian with 2-body resonant scattering condition can give rise to Efimov bound states with discrete scale invariance. In both cases, the magnetic field introduces a new length scale and breaks the discrete scale invariance of the system down to approximate discrete scale invariance. The formation and dissolution of Efimov bound states largely change the densities of mobile carriers, and further give rise to log-B periodic magneto-resistance oscillations beyond the quantum limit. Due to the ultralow carrier density and small Fermi velocity of recent Dirac semimetal materials, the results of two-body Weyl model are more relevant to the experimental results.

Refs: arXiv:1704.00995