



# 清华大学高等研究院

Institute for Advanced Study, Tsinghua University

## 学术报告

**Title:** First-principles design and characterization of exotic quantum materials

**Speaker:** Zheng Liu  
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**Time:** 3:00pm, Thursday, 2014-02-13

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

### Abstract

An important goal of modern condensed matter physics is to search for new phases of matters. After nearly half a century's development, the density-functional-theory-based first-principles calculation has become a powerful tool to bridge innovative theoretical models with experimentally accessible materials. In this talk, I will discuss three our recent works as examples to demonstrate the applications of first-principles calculation on designing and characterizing exotic quantum materials. The topics include: (1) enhancing electron-phonon interaction in graphene by strain; (2) realizing flat Chern bands in organometallic frameworks; and (3) constructing effective models of frustrated magnets.