



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

学术报告

- Title:** What makes magic: high-order Fermi surface singularity
- Speaker:** Noah F. Q. Yuan (MIT)
- Time:** 3:30pm, Wednesday, May 8, 2019
- Venue:** Conference Hall 322, Science Building, Tsinghua University

Abstract

Recently, unconventional superconducting phase and correlated insulating phase in twisted bilayer graphene have attracted a lot of attention, which occurs at specific fillings and within a narrow range of twist angles (so-called magic angle). In this talk, I would like to address the following questions.

1. What are the suitable models to describe the electronic states in twisted bilayer graphene?
2. Why is the “magic angle” so special?
3. What are the possible superconducting and insulating phases at half filling?

Related topics such as strain effect and other superlattices will also be discussed.

References:

1. Noah F. Q. Yuan, Hiroki Isobe, Liang Fu, Magic of high-order van Hove singularity, arXiv: 1901.05432 (2019).
2. Noah F. Q. Yuan and Liang Fu, Model for the metal-insulator transition in graphene superlattices and beyond, Phys. Rev. B 98, 045103 (2018). Editors' Suggestion & Featured in Physics.
3. M. Koshino, Noah F. Q. Yuan, T. Koretsune, M. Ochi, K. Kuroki, L. Fu, Maximally-localized Wannier orbitals and the extended Hubbard model for the twisted bilayer graphene, Phys. Rev. X 8, 031087 (2018).
4. H. Isobe, Noah F. Q. Yuan, L. Fu, Superconductivity and Charge Density Wave in Twisted Bilayer Graphene, Phys. Rev. X 8, 041041 (2018).
5. Zhen Bi, Noah F. Q. Yuan, L. Fu, Designing Flat Band by Strain, arXiv: 1902.10146 (2019).