



清华大学高等研究院

Institute for Advanced Study, Tsinghua University

学术报告

- Title:** Imaging Strongly Interacting Electrons in One Dimension
- Speaker:** Shahal Ilani
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- Time:** 3:30pm, Monday, June 3, 2019
- Venue:** Conference Hall 213, Science Building, Tsinghua University

Abstract

When quantum mechanics and Coulomb repulsion are combined in a perfectly clean solid, some of the most fascinating electronic phases in nature can emerge. However, real solids are never perfect, and thus their interesting behavior is often swamped by the presence of disorder. In this talk I will describe recent technological breakthroughs that allow us to create extremely clean electronic devices based on carbon nanotubes. We utilize these devices as a powerful laboratory for studying quantum mechanics of electrons ‘on a wire’, and as a new type of a scanning probe, capable of imaging electrical charge with unprecedented sensitivity and minimal invasiveness. I will show how using such platforms we were able to obtain the first images of the long-sought quantum crystal of electrons[1], to image many-body tunneling, and to observe attraction between electrons that is generated only by Coulomb repulsion[2].

[1] I. Shapir et al., Science 364, 870-875 (2019).

[2] A. Hamo et al., Nature 535, 395-400 (2016).

