



# 清华大学高等研究院

Institute for Advanced Study, Tsinghua University

## 学术报告

**Title:** **Discovering topological edge state in superconducting FeSe: a synergistic collaborative effort**

**Speaker:** **Feng Liu**  
*University of Utah / Tsinghua University*

**Time:** **10:00am, Monday, July 18, 2016**

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

### Abstract

Superconducting and topological states are two most intriguing quantum phenomena in solid materials. The entanglement of these two states, the topological superconducting state, will give rise to even more exotic quantum phenomena. While many materials are found to be either a superconductor or a topological insulator, it is very rare that both states exist in one material. Here, we demonstrate by first-principles theory as well as scanning tunnelling spectroscopy and angle-resolved photoemission spectroscopy experiments that the recently discovered ‘two-dimensional (2D) superconductor’ of single-layer FeSe also exhibits 1D topological edge states within an energy gap of  $\sim 40$  meV at the M point below the Fermi level. It is the first 2D material that supports both superconducting and topological states, offering an exciting opportunity to study 2D topological superconductors through the proximity effect.

This talk is based on Nature Materials (2016) [doi:10.1038/nmat4686].

**About the speaker:** Professor Feng Liu is the Department Chair of MSE in University of Utah, and the "Thousand Talents Plan" visiting professor in Tsinghua University. He was elected as the APS Fellow in 2011 for his “contributions to the theory of nanostructures and strain-induced nanoscale self-assembly.” Currently, he also serves as the Divisional Associate Editor of PRL.