

# LECTURES ON FRONTIERS OF QUANTUM MATTERS

量子物质前沿讲座



TITLE |

## Symmetry Protected Topological Phases and Phase Transitions

SPEAKER |

**Yi-Zhuang You**  
(University of California, San Diego)



TIME |

15:00-16:30 July 17, 18, 19, 2018



VENUE |

Room 104, Science Building  
Tsinghua University

主办方：清华大学高等研究院

ABSTRACT

Symmetry protected topological (SPT) phases are quantum phases that go beyond Landau's paradigm. In the past few years, much progress has been made in classifying and characterizing SPT phases. Recently, more interest is also shifted to study the exotic quantum phase transitions between SPT phases. The development of SPT physics not only deepens our understanding of quantum phases of matter in the condensed matter community but also generates impact on the field theory duality and lattice gauge theory in the high energy community. The unique features of SPT phases and phase transitions are being tested in the on-going numerical simulations and may also find experimental realizations in the near future. I will give three lectures on SPT-related topics, from the basic ideas of SPT phases to the latest development in understanding SPT transitions.

The three lectures will cover examples of fermionic and bosonic SPT phases in one, two and three dimensions; the relation between fermionic and bosonic SPT states and interaction reduced classification; bosonic SPT transitions in two dimension, deconfined quantum criticality and the mini web of duality; symmetric mass generation and its relation to SPT physics.