



# 清华大学高等研究院

Institute for Advanced Study, Tsinghua University

## 学术报告

- Title:** Lattice Construction of Duality with Non-Abelian Gauge Fields in 2+1D
- Speaker:** Chao-Ming Jian (UCSB)
- Time:** 2:00pm, Thursday, July 12, 2018
- Venue:** Conference Hall 322, Science Building, Tsinghua University

### Abstract

The lattice construction of Euclidean path integrals has been a successful approach of deriving 2+1D field theory dualities with a  $U(1)$  gauge field. In this work, we generalize this lattice construction to dualities with non-Abelian gauge fields. We construct the Euclidean spacetime lattice path integral for a theory with strongly-interacting  $SO(3)$  vector bosons and Majorana fermions coupled to an  $SO(3)$  gauge field and derive an exact duality between this theory and the theory of a free Majorana fermion on the spacetime lattice. We argue that this lattice duality implies the desired infrared duality between the field theory with an  $SO(3)$  vector critical boson coupled to an  $SO(3)$  Chern-Simons gauge theory, and a free massless Majorana fermion in 2+1D. We also generalize the lattice construction of dualities to models with  $O(3)$  gauge fields.