量子材料科学中心
International Center for Quantum Materials

Weekly Seminar

Symmetry-Protected Topological Orders in Interacting Bosonic Systems

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- **Time: 4:00pm, Jan. 23, 2013 (Wednesday)**
- **时间：2013.1.23(周三)下午4:00**
- **Venue: Conference Room A (607), No. 5 Science Building**
- **地点：理科5号楼607**

Abstract

Symmetry-protected topological (SPT) phases are bulk-gapped quantum phases with symmetries, which have gapless or degenerate boundary states as long as the symmetries are not broken. The SPT phases in free fermion systems, such as topological insulators, have been experimentally discovered and classified; however, it is not known what SPT phases exist in general interacting systems. In this talk, I discuss a systematic way to construct SPT phases in interacting bosonic systems. Just as group theory allows us to construct 230 crystal structures in three-dimensional space, we use group cohomology theory to systematically construct different interacting bosonic SPT phases in any dimension and with any symmetry. We discover one bosonic topological insulator in two dimension, three kinds in three dimension and one bosonic topological superconductor in three dimension.

About the speaker

2002-2006, Bachelor degree, Tsinghua University;
2006-2012, Ph.D., Massachusetts Institute of Technology;
2012-present, Miller Fellow, University of California, Berkeley