



Topological States of Bosons and Fermions in Synthetic Magnetic Field

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Venue: Room w563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

The study of topological phases has been a central topic of condensed matter physics since the observations of the quantum Hall effect. The discovery of topological insulators signifies that the interplay between topology and symmetry can lead to interesting new phenomena. In this talk, I will describe the physics of two-component bosons or fermions in synthetic magnetic field where the field strengths for the two components may be tuned separately. A variety of states, including topologically ordered states and symmetry-protected topological states, are proposed and characterized using trial wave functions and Chern-Simons field theories. It is confirmed by numerical calculations that these states can be realized using simple Hamiltonians defined in continuum or lattice. Our work suggests that a rich set of topological states can be created using specially designed artificial gauge fields.

About the speaker

Dr. Yinghai Wu obtained his bachelor degree from University of Science and Technology of China in 2009. He was a graduate student at Pennsylvania State University from 2009 to 2014 and completed his Ph. D. degree under the supervision of Prof. J. K. Jain. He has been a postdoc in the theory group of the Max Planck Institute of Quantum Optics since 2014.