



Tsinghua University
Department of Physics

Physics Colloquium

2012

Fall

Orbital dance beyond standard optical lattices

Abstract

Since the 1995 observation of Bose-Einstein condensation, the field of ultracold gases has advanced dramatically, driven to a large extent by rapid development of experimental techniques. Among them, the use of interfering laser beams to form periodic potentials, now widely known as optical lattices, has significantly impacted on the landscape of condensed matter research. In this talk, I will try to present some of the most exciting progresses in two different angles. One is the remarkable success in using optical lattices to model important problems in condensed matter physics. Another is the reach of conceptually new regimes of many-body physics by implementing novel lattice geometries (checkerboard, hexagonal, and double-well). The latter leads to the unprecedented control of population of atoms in the higher orbital bands and opens an avenue towards studying orbital-related topological or correlated phases of matter that have no prior analogues in electronic solids.

Speaker

W. Vincent Liu received his B.S. from Jinlin University in 1991 and M.S. in Beijing Normal University in 1994. He got his Ph.D. in University of Texas at Austin in 1999. He worked in Department of Physics, University of Illinois at Urbana-Champaign as Postdoctoral Research Associate from 1999 to 2001. He was the Postdoctoral Fellow in Department of Physics, MIT during 2001-2004. In 2004, he joined in the Department of Physics and Astronomy, University of Pittsburgh and became Associate Professor with tenure in 2009.



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Zheng Yu-Tong Lecture Hall, New Science Building

W. Vincent Liu

University of Pittsburgh