北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar

Dynamics of Quantum Many-body Systems

Dr. Pengfei Zhang

Burke Fellow, California Institute of Technology

Time: 3:30pm, Dec. 23, 2021 (Thursday)

时间: 2021年12月23日 （周四）下午3:30

Venue: Room W563, Physics building, Peking University

地点: 北京大学物理楼, 西563会议室

Abstract

Understanding the dynamics of quantum many-body systems is one of the most important topics in modern quantum physics. In this talk, I will present two recent theoretical works on quantum dynamics in AMO systems and holographic quantum matters. On the AMO side, we study a novel platform for controlling atom-photon interactions, the quantum atomic array with subwavelength lattice constant. Using the diagrammatic approach, we analyze the effect of fractional filling and trapping, as observed in experiments. On the holographic quantum matter side, we study the information scrambling in many-body systems using Sachdev-Ye-Kitaev-like solvable models. We give a fundamental bound on the stability of the quantum Lyapunov exponent, which also has implications in sub-AdS holography.

About the speaker

Pengfei Zhang is a Burke Fellow postdoc at Caltech in the group of Prof. Alexei Kitaev. He got his B.Sc. from the Department of Physic, Tsinghua University, in 2015, and his Ph.D. in Physics from the Institute for Advanced Study, Tsinghua Univeristy in 2019, under the supervision of Prof. Hui Zhai. His main research areas include holographic quantum matter, cold atoms, and quantum machine learning.