北京大学量子材料科学中心

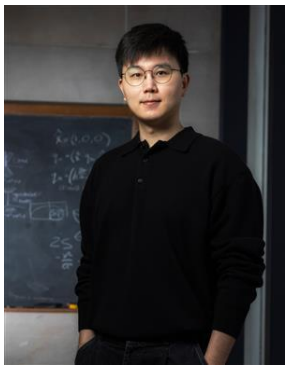
International Center for Quantum Materials, PKU

Seminar

Defining non-equilibrium phases of matter

Jong Yeon Lee

UIUC



Time: 3:00 pm, May 21, 2026 (Thursday)

时间：2026年5月21日（周四）下午3:00

Venue: Room w563, Physics building, Peking University

地点：北京大学物理楼，西563会议室

Abstract

In this talk, I will present recent works that establish a systematic framework to study mixed-state phases of matter. This is achieved by identifying three information-theoretic quantities that can play the role analogous to the spectral gap in the study of quantum phases of matter. These three conditions correspond to (i) local recoverability, (ii) no long-range correlations, and (iii) spatial uniformity. States obeying them exactly are fixed points, while only approximately are phases of matter away from fixed points. I will discuss how approximate versions of these conditions provide robust topological data. Taking further steps, I will introduce the notion of “information critical phase”, which is characterized by continuously tunable fractional amount of remaining information.

About the speaker

Jong Yeon Lee is an Assistant Professor at UIUC, affiliated with the Anthony Leggett Institute of Condensed Matter Theory and IQUIST. He received his Ph.D. from Harvard University under Ashvin Vishwanath and was previously a Moore Fellow at KITP and a Research Scholar at UC Berkeley. His research explores non-equilibrium quantum matter, mixed-state phases, decoherence, topological order, and quantum information.