



Seminar

Machine Learning for Quantum Materials, Models, and Algorithms

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Time: 10:00am, June 06, 2024 (Thursday)

时间: 2024年06月06日 (周四) 上午 10:00

Venue: Room W563, Physics Building, Peking University

地点: 北京大学物理楼西563

Abstract

Today, we frequently face significant challenges due to the vast degrees of freedom of quantum many-body systems and the large-scale data acquired by our instrumentation and algorithms, which constantly defy our scientific analysis. Here, we sketch how machine learning may emerge as a novel yet natural perspective on overcoming such difficulties in quantum many-body physics. We report our developments in machine learning in analyzing quantum states from large, complex, and noisy experimental or numerical data, positively identifying exotic quantum matter such as emergent charge order and quantum spin liquid. We also introduce our machine-learning-based algorithms for compiling quantum circuits and analyzing quantum many-body Hamiltonians, pinpointing their ground-state properties and vital phase diagrams.

About the Speaker

Dr. Yi Zhang is a theoretical condensed matter physicist. He obtained his undergraduate degree at Fudan University and his Ph.D. at UC Berkeley under advisor Prof. Ashvin Vishwanath. Afterward, Dr. Zhang joined Stanford University as a SITP postdoctoral fellow and later Cornell University as a Bethe fellow. He joined the International Center for Quantum Materials at Peking University as a junior faculty member in 2019. Dr. Yi Zhang is interested in emergent phenomena and novel approaches in quantum materials and systems, including machine-learning perspectives for characterizations and analysis.