Seminar

Machine Learning meets Quantum Many-body Physics

Di Luo
Massachusetts Institute of Technology & Harvard University

Time: 10:00am, February 20, 2024 (Tuesday)
时间：2024年02月20日（周二）上午10:00
腾讯会议链接： https://meeting.tencent.com/dm/9ZmjZGETeH1c
腾讯会议ID：943-145-623

Abstract

The simulation of quantum many-body physics, pivotal in uncovering ground state properties and real-time dynamics, is essential in the study of quantum science. In this talk, I will focus on how neural network quantum states, enriched with symmetries and physics principles, provide new opportunities for tackling challenges in quantum many-body simulations. I will introduce the pioneering work of designing anti-symmetric and gauge equivariant neural wavefunctions, which provides new tools for exploring exotic phases of quantum matter in two-dimensional quantum materials and quantum gauge theories. Furthermore, I will discuss how neural network generative models can be used to simulate real-time open quantum systems based on quantum information theory, and applied in quantum experiments and computation. I will conclude with a discussion on the new possibilities of AI for physics, as well as how physics theories can help advance AI.

About the Speaker

罗迪，麻省理工学院和哈佛物理博士后与AI Institute for Artificial Intelligence and Fundamental Interactions 研究员（IAIFI Fellow）。他2016年在香港大学获得物理和数学双学士学位，2021年从伊利诺伊大学香槟分校UIUC获得数学硕士和物理博士。他的研究兴趣为AI+Science和量子计算，包括发展AI和量子算法用于量子物态，高能物理和量子信息的科学模拟和发现，以及利用量子物理和统计物理发展构建AI理论和模型。