Seminar

Machine learning quantum states and entanglement

Dong-Ling Deng

JQI, University of Maryland at College Park

Time: 4:00pm, July 11, 2017 (Tuesday)

时间：**2017年7月11日 （周二）下午4:00**

Venue: Room W563, Physics building, Peking University

地点：北京大学物理楼，西**563**会议室

Abstract

Recently, machine learning has attracted tremendous interest across different communities. In this talk, I will briefly introduce a new neural-network representation of quantum many-body states. I will show that this representation can describe some topological states, either symmetry protected or with intrinsic topological order, in an exact and efficient fashion. I will talk about the entanglement properties, such as entanglement entropy and spectrum, of those quantum states that can be represented efficiently by neural networks. I will also show that neural networks can be used, through reinforcement learning, to solve a challenging problem of calculating the power-law entangled ground state for a model Hamiltonian with long-range interactions.

References:
[1] D.-L. Deng, X. P. Li, and S. Das Sarma, arXiv: 1609.09060
[2] D.-L. Deng, X. P. Li, and S. Das Sarma, Phys. Rev. X, 7, 021021 (2017).

About the speaker

Dong-Ling Deng graduated from Nankai University in 2007 with two Bachelor degrees, one in physics and the other in mathematics. He then studied in the Chern Institute of Mathematics and got a Master degree in theoretical physics. After that, he moved to the University Michigan and obtained his Ph.D. under Prof. Luming Duan. Now, he is a Joint Quantum Institute Postdoctoral Fellow, working with Prof. Sankar Das Sarma at the University of Maryland. Dr. Deng's main research interests concern quantum information and condensed matter physics.