



Weekly Seminar

Quantum computing with near-term quantum hardware

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Peking University

Time: 3:00pm, Mar. 31, 2021 (Wednesday)

时间: 2021年3月31日 (周三) 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

摘要

Quantum computer could solve classically intractable problems. Since realizing a universal quantum computer is challenging with current technology, a more practical question before having a fully-fledged quantum computer is what we can do with current and near-term quantum hardware. Focusing on the noisy-intermediate-scaled-quantum regime, we introduce variational quantum algorithms for solving static and dynamic problems of many-body physics. We show how to suppress device errors due to implementation imperfection on both digital and analog quantum computers. The algorithms are also applicable to other tasks, including quantum machine learning, quantum sensing, and quantum error correction. With the rapid development of quantum hardware, error-mitigated variational quantum algorithms may finally enable genuine quantum advantage demonstration in the noisy-intermediate-scaled quantum era.

个人简介

Dr. Xiao Yuan is currently an assistant professor at the Center on Frontiers of Computing Studies, Peking University. He received his Bachelor in theoretical physics from Peking University in 2012 and got his PhD in physics from Tsinghua University in 2016. Then he worked as a postdoc at University of Science and Technology China in 2017, at Oxford University from 2017 to 2019, and at Stanford University from 2019 to 2020. Dr. Xiao Yuan's research interests focus on three aspects of quantum information science, including near-term and universal quantum computing, quantum foundation, and quantum cryptography.