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Department of Medicine
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Channing Network Science Seminar

June 17 (Friday), 2022, 9AM (ET)

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Computation with Tensor Networks

Abstract: In statistical mechanics, the partition function at a finite temperature can be estimated by contracting a tensor network that is mapped from the physics problem. When equipped with the “Tropical” algebra, the tensor network contraction can compute the energy and entropy directly at zero temperature. When the interactions in the model are complex rather than real, computing the partition function acts as estimating the amplitudes of the final state of a quantum circuit. In this talk, I will present methods and algorithms for solving statistical mechanics problems, combinatorial optimization problems, and quantum circuit simulations, in an integrated framework of tensor networks, focusing on a particular application in simulating Google’s Sycamore quantum circuits.



Bio: *Dr. Pan Zhang is a professor at the Institute of Theoretical Physics, Chinese Academy of Sciences (ITP, CAS). He finished his Ph.D. at Lanzhou University and ITP, CAS in 2009 and did post-docs at spin glass theory groups in Europe and the Santa Fe Institute in the USA before joining ITP, CAS in 2015. Pan Zhang’s research interest is in the interdisciplinary field of statistical physics, machine learning, quantum many-body, and quantum computation.*

Hosted by Yang-Yu Liu

