

Massachusetts Institute of Technology
Department of Physics

Condensed Matter Theory Seminar

"Variational Approach for Quantum Simulation"

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Abstract: Many non-trivial quantum states, such as quantum critical points or topological phases, can potentially be realized in synthetic quantum systems, such as trapped ions or superconducting circuits. However, finding efficient and realizable approaches for such state preparation is challenging. I will show how a variant of the Quantum Approximate Optimization Algorithm (QAOA), originally introduced as a variational approach for solving classical optimization problems, serves as an efficient and general approach for realizing non-trivial quantum states. I will then show how long-range interactions, for example those in trapped ions systems, can further facilitate quantum state preparation. These techniques can be generalized for finite temperature quantum simulation; I'll present a method to prepare thermofield double states.

12:00pm noon
Friday, March 1, 2019
Duboc Room (4-331)

Host: Liang Fu