Invited talks

Tensor Network States for the study of quantum many-body systems

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The term Tensor Network (TN) States designates a number of ansatzes that can efficiently represent certain states of quantum many-body systems. In particular, they can be used to study numerically ground states and thermal equilibrium of local Hamiltonians, and, to some extent, real time evolution. Quantum information theory explains why they are suitable for physically relevant states, and why there are limitations connected to the simulation algorithms.

We can say that TN methods constitute quantum inspired algorithms for classical simulations. At the same time, they can be decisive tools to design and verify the near term quantum simulators. While originally introduced in the context of condensed matter physics, where they have become a state-of-the-art technique for strongly correlated one-dimensional systems, in the last years it has been shown that TNS are also suitable for a broad variety of problems.