Universität Bielefeld Fakultät für Physik

Condensed Matter Theory

Seminar

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Correlation-Enhanced Neural Networks as Interpretable Variational Quantum States

Variational methods have proven to be excellent tools to approximate ground states of complex many body Hamiltonians. Generic tools like neural networks are extremely powerful, but their parameters are not necessarily physically motivated. Thus, an efficient parametrization of the wave-function can become challenging. In this presentation I will explain neural network quantum states in general and introduce a physically motivated neural-network based variational ansatz allowing for a tunability with respect to the relevant correlations governing the physics of the system. The success of this approach is illustrated on topological, long-range correlated and frustrated models. Additionally, I will introduce compatible variational optimization methods for exploration of low-lying excited states without symmetries that preserve the interpretability of the ansatz.

Thursday, 01.07.2021, 14:15 Uhr
zoom/online