

# Tensor networks for Lattice Gauge Theories and Atomic Quantum Simulation

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**Reference:**

ArXiv:1312:3127

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<http://arxiv.org/abs/1312.3127> [2]

We show that gauge invariant quantum link models, Abelian and non-Abelian, can be exactly described in terms of tensor networks states. Quantum link models represent an ideal bridge between high-energy to cold atom physics, as they can be used in cold-atoms in optical lattices to study lattice gauge theories. In this framework, we characterize the phase diagram of a (1+1)-d quantum link version of the Schwinger model in an external classical background electric field: the quantum phase transition from a charge and parity ordered phase with non-zero electric flux to a disordered one with a net zero electric flux configuration is described by the Ising universality class.

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