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Quantum technologies for lattice gauge theories

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Recently there have been a boost in the research activities related to quantum simulations: on the one hand, recent experimental results showed how the field is becoming mature to provide interesting simulations of many-body physics. On the other hand, following the original idea put forward by Feynman, it has become clear that quantum simulators could be applied to a long-standing problem, namely the study of lattice gauge theories in cases where standard lattice calculations are hindered by the sign problem, e.g. finite chemical potential and real-time evolutions.

Here, we review some of the latest developments in the field and report on recent theoretical proposals and numerical results which are exploring the path towards the quantum simulation of lattice gauge theories.

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