

Towards quantum simulation of gauge/gravity duality and lattice gauge theory



Queen Mary University of London: Mar 4-6, 2024

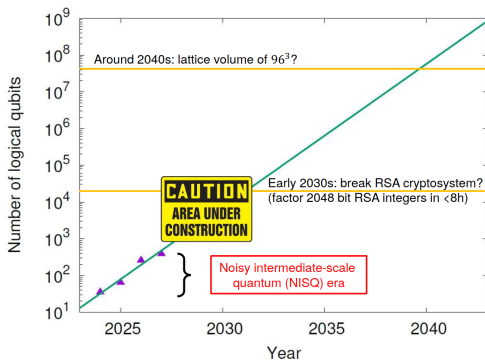
Workshop goal

The workshop aims to bring together recent approaches for quantum simulation related to gauge and gravitational theories. The main focus is the related to the context of gauge/gravity duality. This includes besides lattice gauge theory also supersymmetric theories, SYK models, and classical gravity.

<https://indico.tpi.uni-jena.de/event/359/>

Advantages of the more general topic not focused on lattice QCD simulations

- no direct competition with well-established algorithms
- one can choose in a larger set of problems the ones that provide clear advantages or are a good playground
- more general viewpoint helps to find new approaches



Broad range of topics in the program

Registration	.....
Welcome	.....
Real time evolution of a $SU(2)$ pure gauge lattice theory on a IBM quantum hardware	..
Thermalization and hadronization of $SU(N)$ gauge theories	.....
Canonical Momenta in Digitized $SU(2)$ Lattice Gauge Theory	.....
Simulating fermionic scattering using a digital quantum computing approach (remote)	..
Towards simulating the large N QCD string on a quantum computer	.....
SNAQs - Spin-Network Algorithms for Q -deformed Gauge Theories	.....
Cold-atom quantum simulators of gauge theories	.....
Real-time dynamics of SYK model on a noisy quantum computer (remote)	.....
Talk 9	.....
Talk	.....
Quantum algorithms from algebraic Hilbert spaces.	.....
Talk 11	.....
Geometry from Quantum Field Theories – “AdS/CFT” by a conformal flow –	.....

- invite speakers to use the longer time of their talk to provide more detailed introduction
- larger breaks should be useful to stimulate the discussions