



Contribution ID: 257

Type: **Parallel Talk**

## Fuzzy Qubitization of Gauge Theories

*Tuesday, 1 August 2023 14:50 (20 minutes)*

Formulating bosonic field theories for quantum simulation is a subtle task. Ideally, one wants the smallest truncation of the bosonic Hilbert space that simultaneously exhibits a high degree of universality. But many of the most straight-forward truncations probably do not exhibit much universality. Meanwhile, recent work on the so-called “fuzzy” sigma model has shown promise as a very efficient qubitization of the 1+1d sigma model, with only a 4-dimensional 1-site Hilbert space. In this talk we discuss the generalization of the fuzzy strategy to non-abelian gauge theories. We argue that a promising gauge theory can be constructed based on the Orland-Rohrlich gauge magnet, and we contrast this “fuzzy” gauge theory with the traditional Laplacian truncation strategy.

### Topical area

Quantum Computing and Quantum Information

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**Session Classification:** Quantum Computing and Quantum Information