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# Quantum computing of gauge fields

*Thursday, 10 September 2026 11:00 (40)*

This talk aims to explore the relation between gauge fields, which are at the basis of our understanding of fundamental interactions (including gravity) and quantum information. Our primary focus is on SU(2) gauge fields, where a spin network representation of gauge-invariant states is possible. The spin network framework offers a unique perspective on the entanglement structure inherent in gauge theories. Additionally, representing these states through quantum circuits paves the way for simulating non-abelian field theories using quantum computers. We will present the results from quantum simulations of simple SU(2) gauge field configurations on IBM's 5-qubit (Yorktown) and 15-qubit (Melbourne) superconducting quantum computers.

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