



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
SEMINAR

HEP Opportunities in the Quantum Computing Era

by

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Date: May 14, 2024 (Tuesday)

Time: 4:00 - 5:00 p.m.

Place: L2, Science Centre, CUHK

ALL INTERESTED ARE WELCOME

Abstract

Quantum simulation of High Energy Physics (HEP) has seen remarkable growth in recent years. Nevertheless, there is a continuous need for advancements in the overall simulation framework. In my talk, I will first motivate the critical need for quantum computing in HEP and discuss recent developments. Then I will focus on a specific element - digitization, the step to encode field variables into qubits. This is particularly relevant for gauge theories with local symmetry and field variables of infinite dimension. I will explore the connection between gauge theory digitization methods and approximate error correction codes, present the existence of error thresholds below which gauge-redundant digitizations combined with error correction has better fidelity than removing these redundancies.