

Spring 2026 Colloquium

Thursday, January 29, 2026

4pm to 5pm

127 McFarland Science Building

(Refreshments available at 3:50pm)

Quantum Computers as “Discovery” Machines

Dr. Talal Chowdhury

University of Kansas

Abstract

Quantum computers are poised to revolutionize computation, with profound implications for science, technology, finance, and society. Their unique ability to simulate complex quantum systems represents a breakthrough in understanding dynamics that are often beyond the reach of traditional experiments. In this talk, I will showcase how quantum computers can be harnessed as powerful programmable platforms to accurately prepare and investigate intricate quantum many-body systems, and describe how their quantum simulation capabilities not only offer substantial computational advantages over classical computers but also serve as a discovery tool, uncovering new quantum phenomena. To illustrate my point, I will draw on examples from quantum spin systems, fermionic models, and black hole physics and show that current quantum computers are already making significant strides in deepening our understanding of fundamental physics.

Dr. Talal Chowdhury is a quantum computing scientist and theoretical high-energy physicist at the University of Kansas. Currently, he is the research project coordinator for the Inter-American Network of Networks of Quantum Chromodynamics Challenges (I.ANN QCD) within the Department of Physics and Astronomy at KU. He was also an assistant professor in the Department of Physics at the University of Dhaka. His research interests include quantum computing, quantum information science, and theoretical high-energy physics.

