USC Dornsife College of Letters, Arts and Sciences
Department of Physics and Astronomy

Ming Hsieh Institute - Physics

Joint Seminar Series

USC Viterbi School of Engineering
Ming Hsieh Department of Electrical and Computer Engineering

Gate Model Quantum Computing with Atom Arrays

Mark Saffman

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Friday, December 6, 2024
SSL 202
2:00 pm

Abstract:
Quantum computing with neutral atom qubits has advanced rapidly with the development of large 2D arrays and high-fidelity entangling gates. We have used atomic qubits for a variational simulation of the Lipkin-Meshkov-Glick model incorporating noise mitigation techniques. The talk will provide an overview of architectural options for neutral atom qubit arrays and present new approaches for implementing nonlocal QEC codes and fast measurements, as well as progress towards photonic remote entanglement.

Bio sketch:
Mark Saffman is an experimental physicist working in the areas of atomic physics, quantum and nonlinear optics, and quantum information processing. His research team was the first to demonstrate a quantum CNOT gate for the deterministic entanglement of a pair of neutral atoms. This was done using dipole mediated interactions between highly excited Rydberg atoms. He is currently developing scalable arrays of neutral atoms for quantum computation, communication, and sensing applications.
He is the Johannes Rydberg Professor of Physics at the University of Wisconsin-Madison and has been recognized with an Alfred P. Sloan fellowship, a Vilas Associate Award, the WARF Innovation Award, and is a fellow of the American Physical Society, and Optica. He has been active in professional service including two decades as an Associate Editor at the Physical Review and is the director of The Wisconsin Quantum Institute. He also serves as Chief Scientist for Quantum Information at Infleqtion, Inc.

Hosted by
Quntao Zhuang, Eli Levinson-Falk, Jonathan Habif, Daniel Lidar, Kelly Luo, Todd Brun, Tony Levi, Stephan Haas