

Friday, March 31, 2017

4:10 – 5:00 PM

Barnard/EPS 103

**Quantum Simulation with
Circuit Quantum Electrodynamics**

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Mark received his B. S. in Physics from MSU in 1981

Abstract:

Quantum computing is, perhaps, the most novel method of calculation yet invented by man. Feynman's initial inspiration and warning, "by golly, it doesn't look so easy," has proven prophetic. I will review the history and key concepts of quantum computing, and describe the status of qubit technologies. I will describe in particular superconducting (SC) qubits and circuit quantum electrodynamics, focusing on the difficulties of controlling and entangling qubits while minimizing decoherence- the unintended loss of quantum information. Returning to Feynman's speculation that quantum computers would be required to simulate molecules and other quantum phenomena, I will describe how qubits can be used to solve the electronic structure problem and show our early results using a seven-qubit device to solve the electronic structure problem for di- and tri-atomic molecules.

Host: Rufus Cone

***** Refreshments served in the Barnard/EPS second floor atrium at 3:45 *****