

# CU Physics Department Colloquium

Monday, October 26, 2009 4:10 PM 428 Pupin Hall

## Entanglement and Quantum Algorithms with Superconducting Circuits

By using the unique properties of quantum physics, such as entanglement and superposition, quantum computers are predicted to be vastly more powerful than their classical counterparts for certain tasks. While some technologies, such as NMR and trapped ions, have succeeded in making and manipulating a handful of quantum bits (qubits), they look quite different from a conventional computer, and there are many obstacles to building large-scale processors. At Yale, we use superconducting circuits to make macroscopic, solid-state qubits which are controlled and measured entirely by a sequence of electronic pulses on wires. These devices have advanced to the point where we can generate and highly-entangled states, and perform universal quantum gates. I will describe recent experiments showing the operation of Grover's search algorithm, and a measurement of entanglement by a Bell-type experiment on two qubits.

**Robert Schoelkopf, Yale University**

Hosted by Boris Altshuler - Meet the Speaker at 1:30 pm in 705 Pupin

