

**Dr. Chii-Dong Chen**

**Title: Quantum gates for 1D arrays of directly coupled transmon qubits**

Abstract:

I will present our recent study on 1D arrays of directly coupled transmon qubits. The devices have undergone simulation, design, and fabrication in our laboratory. I will delve into the specifics of the design parameters and outline our testing procedures for both single-qubit and two-qubit logic gates. I will then discuss our experiments involving five qubits, demonstrating and confirming their entanglement. Following that, I will elucidate our utilization of parametric amplifiers to read the quantum states of individual qubits and assess the accuracy of our logic gates. Lastly, I will elaborate on how we established connections to the external world through a control unit, allowing external users to interact with our quantum computer.