



THE CHINESE UNIVERSITY OF HONG KONG
Department of Physics
COLLOQUIUM

Quantum Computation in Semiconductor Quantum Dot Systems

by

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Time: 4:00 - 5:00 p.m.
Place: L2, Science Centre, CUHK

(Light refreshments will be served 20 minutes prior to the colloquium.)

ALL INTERESTED ARE WELCOME

Abstract

As the size of transistors quickly and inevitably approaches the atomic scale as predicted by Moore's law, quantum effects become more relevant and will subsequently hinder further progress in classical computation. The concept of the quantum computer embraces the physics that governs the quantum mechanical nanoscale world. Rather than adhering to the notion that a computational bit must be either 0 or 1, the quantum bit (qubit) can be 0, 1, or any superposition thereof. These results in a massive parallelism in computation that makes certain quantum algorithms excel above their classical counterparts. A semiconductor quantum dot system is one of many potential candidates for the realization of a physical quantum computer. I will discuss in this talk the implementation of a one-qubit and two-qubit quantum gates using ultrafast optical excitations in single semiconductor quantum dot systems.