

# Joint CQSE and CASTS Seminar

Weekly Seminar  
Oct. 28, 2011 (Friday)

TIME Oct. 28, 14:30 ~ 15:30  
TITLE Phonon-induced Damping of Exciton Rabi Oscillations in  
Optically Excited Quantum Dots  
SPEAKER Dr. Ahsan Nazir  
Department of Physics, Imperial College London  
PLACE Rm716, CCMS & New Physics Building, NTU

## Abstract

In this talk, I shall explore the interplay of quantum coherence and decoherence in quantum dot exciton dynamics. Specifically, I shall describe recent theoretical work demonstrating that the dephasing observed experimentally in single, coherently-driven InGaAs/GaAs quantum dots can be accurately described within a simple weak-coupling master equation formalism [1,2], identifying acoustic phonons as the dominant source of excitonic decoherence. I shall also briefly mention how we have extended the theoretical formalism beyond the weak-coupling regime, by developing both polaron [3] and variational [4] master equation methods.

[1] A. J. Ramsay et al., Phys. Rev. Lett. 104, 017402 (2010)

[2] A. J. Ramsay et al., Phys. Rev. Lett. 105, 177402 (2010)

[3] D. P. S. McCutcheon and A. Nazir, New J. Phys. 12, 113042 (2010)

[4] D. P. S. McCutcheon, N. S. Dattani, E. M. Gauger, B. W. Lovett, and A. Nazir, Phys. Rev. B 84, 081305(R) (2011).

