

**Date:**

December 7, 2006

**Title**

Measurement and control of spin and charge interactions in a single quantum dot molecule

**Speaker**

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**Abstract**

I will discuss recent experiments in which we electrically manipulate coupled exciton states (neutral and negatively charged single excitons) in individual QD-molecules (QDMs). The samples investigated consist of a single pair of vertically stacked, self assembled In<sub>0.5</sub>Ga<sub>0.5</sub>As QD-molecules (QDMs) embedded into the intrinsic region of an n-type GaAs Schottky photodiode. This device enables us to control the coherent coupling between excitonic states in the upper and lower dots by tuning the electric field oriented along the axis of the QD-molecule via the gate voltage. New information is obtained on the charge distribution and spin structure of negatively charged trions in coupled quantum dot nanostructures and we directly probe Coulomb and Pauli blockade effects and inter-dot tunnel coupling using fully optical techniques.

