

# Cavity Quantum Electrodynamics with Quantum Dots

**Date** → Monday, **Dec 2<sup>nd</sup>**, 2013

**Time** → **15:30-16:20**

**Location** → **R833**  
Dept. of Physics / Center for Condensed Matter  
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**All Are Welcome!**

## Abstract

Cavity quantum electrodynamics explores quantum optics at the most basic level of a single photon interacting with a single atom. By placing a double quantum dot inside of a high quality factor microwave cavity, we have been able to explore cavity-QED in a condensed matter system. Our results show that measurements of the cavity field sensitively probe charge and spin dynamics within the nanowire quantum dot.<sup>1,2</sup> We can explore non-equilibrium physics by applying a finite source-drain bias across the double quantum dot, which results in sequential tunneling. We observe significant gain in the cavity field when the energy level detuning of the double dot matches the cavity frequency. These results will be discussed in the context of single atom lasing.

