

Joint CQSE and CASTS Seminar

Weekly Seminar
Dec. 19, 2014 (Friday)

TIME Dec. 19, 14:30 ~ 15:30
TITLE Hybrid quantum systems: towards non-classical states with artificial atoms coupled to mechanical resonators
SPEAKER Prof. Signe Seidelin
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PLACE Rm716, CCMS & New Physics Building, NTU

Abstract

An exciting challenge of modern physics is to investigate the behavior of a material object -for instance a mechanical oscillator - placed in a non-classical state. Many impressive quantum states, including entangled states, have been achieved worldwide with single atoms, molecules and photons, and larger quantum states, such as Bose-Einstein condensates, with dilute atomic gasses. So far, however, only extremely few quantum physics experiments based on macroscopic material objects have been performed, not because of lack of interest, but largely due to the difficulty of such endeavour. One approach consists of exploiting a so-called “hybrid quantum system” in which a mechanical resonator is coherently manipulated via a two-level system (an atom, a quantum dot, a solid-state emitter ...). This system is the “solid-state” analogous to a trapped atomic ion. In this seminar, I will present some approaches towards controlling such mechanical hybrid quantum systems, and I will discuss new and exciting ideas for the future.

