

# Joint CQSE and CASTS Seminar

Weekly Seminar  
Mar. 25, 2016 (Friday)

TIME Mar. 25, 2016, 14:30 ~ 15:30  
TITLE An all-optical cavity QED system & an optomechanical interface between x-ray and optical photons  
SPEAKER Prof. Wen-Te Liao  
Department of Physics, National Central University  
PLACE Rm716, CCMS & New Physics Building, NTU

## Abstract

1st Part: Cavity quantum electrodynamics (CQED) serves as an elegant model for achieving strong coupling between light and matter. In this talk, we will theoretically demonstrate a novel way of controlling the reflectance of an atomic mirror and the finesse of a cavity [1]. Also, an application of manipulating the quasi-1D matter wave emitting superradiance when transversely flying through the atomic cavity will be presented.

2nd Part: We envisage for the first time an optomechanical system that bridges optical photons and x-rays with the aim to control the latter. The x-ray-optical interface system comprises of an optomechanical cavity and a movable microlever interacting with both an optical laser and with x-rays via resonant nuclear scattering. We show that x-ray absorption spectra of nuclei can be tuned optomechanically, which reveals, e.g., optomechanically induced transparency of x-rays.

[1] arXiv:1508.04878 (2015).

[2] arXiv:1508.06769 (2015).

