

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

CONTROLLING LIGHT AT SUBWAVELENGTH SCALES IN NANO-PHOTONIC SYSTEMS: SINGLE-PHOTON DIODE, NANOPARTICLE SENSING, AND SUPER-RESOLUTION IMAGING

PhD Preliminary Research Examination

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Abstract: The capability of controlling light at a scale that is much smaller than the operating wavelength enables new optical functionalities, and opens up a wide range of applications. Such a capability is out of the realm of conventional optical approaches. My research aims to explore the light-matter interactions at nanometer scale, and investigate the novel scientific and industrial applications. In particular, I will describe a photonic diode which generates a unidirectional flow of single photons; I will also explain how to detect nanoparticles using an ultra-sensitive nano-sensor; finally, I will introduce a mechanism to achieve super-resolution to discern fine features that are orders of magnitude smaller than the illuminating wavelength. These research projects synthesize recent advances in quantum nano-photonics, nanotechnologies, imaging reconstruction techniques, and rigorous numerical simulations.

DATE: Thursday, July 24, 2014
TIME: 9:10 a.m.
PLACE: Green Hall, Room 0120

Thesis advisor:
Dr. Jung-Tsung Shen

This seminar is in partial fulfillment
of the Doctor of Philosophy degree