

SEMINAR NOTICE

Preston M. Green Department of Electrical and Systems Engineering

Orders of Magnitude Enhancement of Optical Nonlinear Phenomena in Subwavelength Metal-Dielectric Gratings

MS Dissertation Defense

By

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Abstract: Nonlinear optical materials give rise to a multitude of phenomena that have important applications in technology and science. Due to small nonlinearities in naturally occurring materials, large optical fields are necessary to realize measurable nonlinear phenomena. The necessity of high intensity sources severely limits its use in practical applications, especially in low-powered devices. Several methods for enhancement of nonlinearity have been proposed, including use of conjugate polymers, resonators, and metallic nanoparticles. In this thesis, the nonlinear enhancement properties of subwavelength metal-dielectric grating are explored. Enhancement in nonlinearity by several orders of magnitude is achieved with the enhancement entirely controlled by the geometry of the structure, and independent of the wavelength of incident light. Ultimately, the nonlinear enhancement properties of metal-dielectric gratings allows for the reduction of light intensity in producing nonlinear optical phenomena, and is an important step in the design low-powered nonlinear optical applications.

DATE: Tuesday, April 24, 2012
TIME: 10:00 a.m.
PLACE: Green Hall, Room 0120

Research Advisor:
Dr. Jung-Tsung Shen

This seminar is in partial fulfillment
of the Masters Degree