NANOMATERIALS SPEAKER SERIES

NONLINEAR OPTICAL EFFECTS IN SEMICONDUCTOR MICROCAVITIESAND HYBRID TWO-DIMENSIONAL LIGHT EMITTERS

October 21, 2016 at 12:30pm

Engineering Bulding 2, Rm W122

Nonlinear optical effects in micro-cavity structures has been utilized for hyper-spectral light generation in wide-bandgap semiconductor system. Nano-antennas coupled to the nonlinear micro-cavities can extract second harmonic or multiphoton generated light confined within a strongly coupled system which can be used for beam steering. These novel nonlinear optical process can result in tunable coherent light generation as well as white light generation due to mixing of second harmonic and multiphoton luminescence process. In another material system, modulation of carrier density due to metal nanoparticles within a layered two-dimensional material system can also be used for enhanced light generation using nonlinear optical effects. A competition between resonant plasmonic interaction and electrostatic Coulomb attraction can result in a modification in the light emission from the semiconductor. The intensity of photoluminescence as well as the wavelength of emission can be modified by the modulation of carrier density.

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SPEAKER BIO

Dr. Arup Neogi is a Professor of Physics at the Department of Physics, University of North Texas. He is a Fellow of Japan Society for Promotion of Sciences and a Fellow of Optical Society of America. His area of interest involves Nanophotonics and Ultrafast Optical effects for Optoelectronics and Biophotonics. He is also affiliated with Shimane University Japan and Institute of Frontier and Fundamental Sciences, University of Electronic Science and Technology of China.

Contact Professor Jiming Bao at jbao@uh.edu if you would like to arrange for a time to meet with Dr. Neogi.

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