



Presenter

Dr. Tomoyuki Yoshie

Assistant Professor of Electrical and Computer Engineering
Fitzpatrick Institute for Photonics, Duke University
3529 CIEMAS, 101 Science Drive
Durham, NC 27708-0291
Phone: (919) 660-8448
yoshie@duke.edu



Abstract

Title: *Photonic crystal microcavity: from weak to strong coupling*

Photonic crystals are sub-wavelength optics with translational symmetry in permittivity, and produce constructive interference (photonic band) and destructive interference (photonic bandgap). Recent research activities have advanced designs of photonic crystal devices. Perturbation of photonic crystal lattices can induce localized states, which are useful for constructing optical microcavities; key components in future nanophotonic systems. They can modify optical processes in small volumes. Combined with nano-scale emitters such as quantum dots, therefore, photonic crystals can provide compact lasers, and are excellent test beds for investigating solid-state cavity quantum electrodynamics. This talk will describe photonic crystal lasers and light-matter interactions with a single quantum dot in a photonic crystal nanocavity.

Biography

DR. YOSHIE received his B.Eng. and M.Eng. degrees in Electrical Engineering from Kyoto University in 1990 and 1992, respectively, and then worked as a research engineer and later a chief research engineer at Sanyo Electric, Japan, for developing green-blue-UV semiconductor laser diodes. He received his M.S. and Ph.D. degrees in Electrical Engineering from California Institute of Technology in 2000 and 2004, respectively. He joined ECE Department as an Assistant Professor in 2005. His research interests focus on nanophotonics, optical computation, and nanofabrication.