

ECEE Department Seminar

Tuesday, November 17, 2009

3:30 pm, ECCR 265

Silicon nanophotonics, optoelectronics and light-forces-based optomechanics for telecommunication and computing applications

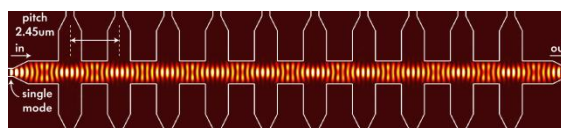
Dr. Milos Popovic

UCB and MIT

Nanophotonic circuits based on high index contrast (e.g. silicon or SiN) support strong confinement of light in wavelength-scale components and strong light-matter interaction. They raise the prospect of dense photonic integration on a chip, and of new device concepts with superior performance for applications in communication and computation. Major challenges to widespread assimilation of nanophotonics into mainstream technology are their enormous sensitivity, and limited scalability and complexity. I will describe work on strong-confinement nanophotonic devices that circumvent these challenges. First, I will address the design of dynamical nanophotonic devices, including switches and modulators, for high energy efficiency – a key requirement for chip-scale tunable optical add-drop multiplexers, future photonic on-chip interconnects for multi-core CPU and CPU-memory interfaces, and other emerging applications. Second, I will describe a new category of devices that merges silicon nanophotonics and nanomechanics into a new class of devices that makes use of light forces to cause nano-scale motion. In turn the motion changes the optical properties thus creating feedback. I will describe some of the exciting new device concepts and design opportunities made possible in this new field of research, and their implications for solving some of the existing challenges of classical nanophotonics.

Milos Popovic is an Assistant Professor of Electrical, Computer and Energy Engineering at the University of Colorado, Boulder (USA), and Principal Investigator of the Nanophotonic Systems Laboratory. Previously, he was a postdoctoral associate and independent investigator at Massachusetts Institute of Technology (USA). He obtained his PhD/MS from MIT in 2007/2002 and B.Sc. from Queen's University, Canada in 1999. His research interests include nano-optomechanics, energy-efficient nanophotonic circuits, nanoscale device design and photonic circuit theory.

For more information, see: <http://ecee.colorado.edu/~popovicm/>



Light refreshments will be served.