



**Southeastern Michigan Section
"Chapter IV" Speaker Series
Thur., April 1, 2010, 4:30 pm
Appetizers and Networking at 4:00 pm
Room #1005 , EECS Bldg,
North Campus, University of Michigan
1301 Beal Ave, Ann Arbor, MI**



" Cantilever couplers for intra-chip coupling to silicon photonic integrated circuits"

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Abstract:

Silicon photonics is a promising candidate for large-scale integrated optics. It is compatible with well-developed and cost-efficient CMOS technology and can be integrated with electronic devices monolithically. A single-mode silicon strip waveguide designed for operation in the infrared has a typical submicron cross-section of 450 nm by 250 nm. Highly confined optical modes allow for high density integration and waveguide bends with micrometer scale radii of curvature. The high confinement, however, also produces major challenges when attempting to efficiently couple light between silicon strip waveguides and optical fibers. Mode conversion from a single-mode fiber, with mode field diameter equal to 10 micrometers, results in a coupling loss that is greater than 20 dB. In this talk, I will discuss this long standing challenge and our group's approach to solving this problem using bilayer cantilever couplers. We have experimentally demonstrated 1.6 dB coupling loss for transverse electric polarization and 2.0 dB coupling loss for transverse magnetic polarization. The approach enables broadband coupling from 1500 nm to 1600 nm wavelength and direct access to devices on an entire chip surface without dicing or cleaving the chip.

Speaker's Biography:

Ronald M. Reano received his M.S. and Ph.D. degrees in electrical engineering from the University of Michigan, Ann Arbor, in 2000 and 2004, respectively. He studied under Prof. Linda P. B. Katehi and Dr. John F. Whitaker in the Radiation Laboratory and Center for Ultrafast Optical Science. His postdoctoral research was in the area of nanotechnology with Prof. Stella Pang in the Solid-State Electronics Laboratory at Michigan. He is currently an assistant professor in the Department of Electrical and Computer Engineering at The Ohio State University, Columbus. His current research interests involve integrated optics, electro-optics, and hybrid RF/optical devices for innovation in sensors, communications systems, and computing. He was the recipient of the DARPA Young Faculty Award in 2008, the ARO Young Investigator Award in 2009, and the NSF CAREER Award in 2010.

Public Invited

Appetizers and Networking at 4:00 pm