

Join us this Wednesday and listen to a talk by a world-renowned scientist:

Heterogeneous Integration for Silicon Photonic Integrated Circuits

J. E. Bowers

University of California Santa Barbara, California, USA
*bowers@ece.ucsb.edu

Abstract

We review progress on using Si as a photonic platform, focusing on lasers, amplifiers, modulators and photodetectors on silicon. We review quantum well and quantum dot lasers and describe progress in silicon photonic integrated circuits.

The silicon photonics field is advancing rapidly, with many new devices demonstrated recently. Demonstrations have shown significantly improved performance that is now approaching that of devices on native InP substrates. In addition to the many passive devices, including AWGs, isolators, and circulators, active devices including lasers, modulators, amplifiers and photodetectors are reaching higher levels of integration. Over 160 devices have been integrated onto a single waveguide for applications such as integrated transmitters for datacom and telecom, true time delay PICs for phased array radars, and two dimensional swept transmitters for LIDAR.

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Recent work has focused on the epitaxial growth of III-V layers on silicon using intermediate buffer layers, typically Ge and strained superlattices, to minimize dislocations propagating into the active region. The use of quantum dot (QD) laser gain material can minimize the effect of threading dislocations on threshold and power, even after aging.

When and where: Wednesday 10/15/2014, 4pm at Spalding 106

John Bowers holds the Fred Kavli Chair in Nanotechnology, and is the Director of the Institute for Energy Efficiency and a Professor in the Departments of Electrical and Computer Engineering and Materials at UCSB. He is a cofounder of Aurion, Aerius Photonics and Calient Networks. Dr. Bowers received his M.S. and Ph.D. degrees from Stanford University and worked for AT&T Bell Laboratories and Honeywell before joining UC Santa Barbara. Dr. Bowers is a member of the National Academy of Engineering and a fellow of the IEEE, OSA and the American Physical Society. He is a recipient of the OSA/IEEE Tyndall Award, the OSA Holonyak Prize, the IEEE LEOS William Streifer Award and the South Coast Business and the South Coast Business and Technology Entrepreneur of the Year Award. He and coworkers received the EE Times Annual Creativity in Electronics (ACE) Award for Most Promising Technology for the hybrid silicon laser in 2007.

Bowers' research is primarily in optoelectronics and photonic integrated circuits. He has published ten book chapters, 600 journal papers, 900 conference papers and has received 54 patents. He has published 180 invited papers and conference papers, and given 16 plenary talks at conferences.

