

Integrated Photonics

By John Bowers, Ph.D.,

May 26, 2016

6:30 pm (pizza and networking), 7 pm talk

California State University Channel Islands, room to be announced

Meetings are free and open to the public



Photonics has transformed our experience with the Internet through low-cost, high-bandwidth fiber optic transmission. The next level of evolution, integrated optics or “silicon photonics” combines electrical and optical components on the same silicon-based substrates that are used in the fabrication of a semiconductor chip. Lasers, photodetectors, beam splitters, isolators, filters, prisms, modulators and optical switches can be designed into the same microchip.

Optical switches have the potential to reduce the energy required to switch data by factor of 10,000. Silicon photonics have the potential to reduce the energy require to transmit data on and off chips by a factor of ten or more. A recent collaboration between UCSB and Intel led to the development of hybrid silicon lasers, which resulted in a prototype, a 50 Gbps high-speed optical data link, which was integrated onto silicon.

JOHN E. BOWERS, Ph.D is a world-leading researcher in the areas of silicon photonics, optoelectronics, energy efficiency and the development of novel low power optoelectronic devices for the next generation of optical networks. Dr. Bowers holds the Fred Kavli Chair in Nanotechnology, and is the Director of the Institute for Energy Efficiency and a Professor in the Department of Electrical and Computer Engineering at UCSB. 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, a fellow of the IEEE, OSA and the American Physical Society, and a recipient of the OSA Holonyak Prize, the IEEE LEOS William Streifer Award and the South Coast Business and Technology Entrepreneur of the Year Award. He has published eight book chapters, 450 journal papers, 700 conference papers and has received 52 patents. He and coworkers received the EE Times Annual Creativity in Electronics (ACE) Award for Most Promising Technology for the hybrid silicon laser in 2007.

