

Title:

Ultra-Low Loss Integration Platform for Passive and Active Components for Next Generation Photonic Integrated Circuits and Terabit Optical Interfaces and Interconnects

Abstract:

There has been progress towards the realization of a new class of ultra low loss waveguide (ULLW) PIC technologies and building blocks that leverage reduced on-chip optical waveguide losses as low as 0.45dB/m and can be integrated with Silicon Photonics and InP PICs to address important system scaling issues like bandwidth, form factor, power density, the power spreading problem and power management, system design, bandwidth management and manufacturability.

The ULLW platform opens up a wide array of functions and applications that require very low loss integrated optical circuits to perform equivalent functions at lower power consumption than purely electronic solutions. A wide range of passive and active components have been demonstrated including long delay and tunable delay lines, 3D stacking technology, low kappa long gratings, ultra high extinction ratio tunable filters, gain blocks, waveguide amplifiers, AWGRs, resonators, switches, vertical couplers and mode matchers and component applications including 1.55 and 1.31  $\mu\text{m}$  and narrow linewidth lasers for coherent communications, adaptive dispersion compensators and transversal optical filters, optical regenerators, optical signal processing elements as well as components compatible with fiber attach and device packaging. We will also talk briefly about next generation technology ... what lies beyond Silicon Photonics and what advantages might exist further down the road.

Bio:

Daniel J. Blumenthal is Professor of ECE at UCSB, Director of the Terabit Optical Ethernet Center and heads the Optical Communications and Photonics Integration (OCPI) group ([ocpi.ece.ucsb.edu](http://ocpi.ece.ucsb.edu)). He co-Founded Packet Photonics and Calient Networks, holds 18 US patents and has over 400 publications in optical communications, optical packet switching, gyro sensors, InP/silicon-photonic integration, ultra low-loss waveguides and integration technology, nano-photonic devices and optical signal processing. He co-authored Tunable Laser Diodes and Related Optical Sources (IEEE–Wiley, 2005). Dr. Blumenthal holds a PhD from the University of Colorado Boulder. He is Fellow of the IEEE and OSA and is recipient of a Presidential Early Career for Scientists and Engineers (PECASE) award and National Science Foundation Young Investigator and Office of Naval Research Young Investigator Program awards. He served on the National Lambda Rail Board of Directors and held an elected Researcher Seat on the Internet-2 Architecture & Operations Advisory Council.