

Integrated Silicon Photonic Systems in Future Cyber-infrastructure

GUEST SPEAKER

Prof. S. J. Ben Yoo

Electrical and Computer Engineering
University of California, Davis

When: **8th July 2011, 10.30 a.m. to 11.30 a.m.**

Where: **Institute of Microelectronics, Singapore**
11 Science Park Road Singapore Science Park II Singapore 117685

Abstract

This talk will cover advanced integrated silicon photonic technologies that will significantly impact the performance and energy-efficiency of future computing and communications systems. InP based integration platform allows integration of lasers, modulators, and detectors using MOCVD and HVPE. In particular, we have developed a 1000 GHz coherent optical transmitter and receiver on a monolithically integrated InP platform containing 1200 active devices. On the other hand, CMOS-compatible silicon photonics offer a practical platform for routing and transporting multi-wavelength optical signals interconnecting electronic processors and memories. Potentially, such a system can grow to a ~1000 core system optically interconnected by 100~1000 wavelengths where a flat-hierarchy computing architecture becomes possible. We will give a number of device and system examples, and conclude by projecting the future cyber-infrastructure filled with integrated chip-scale photonic networking and computing systems. We will first discuss future networking and computing systems enabled by nanophotonic and nanoelectronic technologies. Then, we will discuss recently developed silicon CMOS-photonic integrated circuits capable of reconfigurable signal processing, switching, modulation, and detection. The talk will conclude by addressing the future prospects on photonic-electronic-integrated circuits on a CMOS-compatible SOI platform and their impacts on future Information and Communication Technology (ICT).

About the Speaker



S. J. Ben Yoo is Director of Institute of Intelligent and Integrated Information Technology (I⁴T) and Professor of Electrical Engineering at University of California at Davis (UC Davis). His research at UC Davis includes high-performance optical switching systems, nano photonic-electronic systems integration for next generation networking and computing systems. His recent demonstrations included CMOS photonic lattice filter systems, optical label switching routers scalable to 42 Petabit/sec aggregate capacity with 1000 times improvement in performance/power efficiency. Prior to joining UC Davis in 1999, he was a Senior Research Scientist at Bellcore, leading technical efforts in optical networking research and systems integration. His research activities at Bellcore included optical-label switching for the next-generation Internet, reconfigurable optical networks, wavelength interchanging cross connects, wavelength converters, vertical-cavity lasers, and high-speed modulators. He also participated in the advanced technology demonstration network/multi-wavelength optical networking (ATD/MONET) systems integration, and a number of standardization activities. Prior to joining Bellcore in 1991, he conducted research on nonlinear optical processes in quantum wells, a four-wave-mixing study of relaxation mechanisms in dye molecules, and ultrafast diffusion-driven photodetectors at Stanford University (BS'84, MS'86, PhD'91, Stanford University). Prof. Yoo has served as an Associate Editor for IEEE Photonic Technology Letters, Guest Editors for IEEE/OSA Journal of Lightwave Technology, IEEE Journal of Special Topics in Quantum Electronics. Prof. Yoo is Fellow of IEEE and OSA, and a recipient of the DARPA Award for Sustained Excellence in 1997, the Bellcore CEO Award in 1998, and the Mid-Career Research Faculty Award (UC Davis) in 2004. Prof. Yoo is a Co-Chair of Photonics in Switching conference 2007, 2008, and 2010.

Registration

Pre-registration is required. Closing date is 27th June 2011. To register, please log on:
http://easstar.eventshub.sg/ems_wb_Details.aspx?CallID=28&EventID=290117

Location Map

