

14:20PM-15:10PM **A Silicon Photonics Platform with Heterogeneous III-V Integration**

Wim Bogaerts *Ghent University, Belgium*

Abstract: We will present an overview of the work by Ghent University and imec on a multipurpose photonic platform based on silicon technology with heterogeneous integration of III-V materials. Silicon photonics is widely considered to be the most promising technology to realize a high-performance, low-cost and high-volume photonic platform that can enable complex VLSI photonic functionality. One of the key enablers for silicon photonics is the possibility leverage existing silicon processing technology. Silicon as a material is exceptionally suited for compact passive waveguide circuits, but for light detection, and especially generation, III-V materials are by far superior. Heterogeneous integration of III-V materials on silicon photonic circuits has already been demonstrated in working lasers and efficient photodetectors. We will discuss the recent progress in adhesive III-V-on-silicon bonding technology, with working lasers, microlasers and different types of photodetectors, and how these devices can be used for different purposes. III-V integration can only be successful if integrated in a fully functional silicon photonics platform. III-V materials are typically not used in a silicon process environment. To accommodate the III-V materials inside a silicon process flow, careful considerations have to be made for contamination and temperature budget. Imec is constructing a full silicon photonics platform which not only integrates passive silicon photonics, but also modulators, germanium photodetectors, thermal tuning, III-V integration and 3-D integration with electronics



Biography: Wim Bogaerts received a PhD in 2004 from Ghent University in 2004, on the design and fabrication of nanophotonic components, and especially photonic crystals using silicon technology. He continued to work on the subject of silicon photonics, co-ordinating the activities between the photonics group and the silicon process technology group in IMEC for the fabrication of SOI photonic nanostructures with advanced CMOS tools. This work spurred collaborations with tens of partners all over the world to combine nanophotonic designs into multi-project-wafer runs in IMEC, an activity which is now running as the silicon photonics platform ePIXfab. Currently he is still active in the photonics group as a postdoctoral researcher of the Flemish Science Foundation (FWO), active in both Ghent University and imec, coordinating the silicon photonics work, with a strong focus on active elements (modulators, detectors, tuners) and integration of silicon photonics with other technologies using 3D integration. He keeps a strong interest in telecommunications, information technology and applied sciences. He is a member of IEEE-LEOS and the Optical Society of America (OSA).

Workshop on Frontiers in Silicon Photonics Program

Venue: Multifunction Hall, 2nd Floor
Jadepalace Hotel Beijing China

AM, August 29 Session Chair : Zhiping Zhou	8:30-8:50	Opening Remarks
	8:50-9:40	Communication Technology Roadmap Jurgen Michel <i>Massachusetts Institute of Technology, USA</i>
	9:40-10:30	Optical Communication Evolution Li Zeng <i>Huawei Technologies Co., China</i>
	10:30-10:50	<i>Tea break and group photo at the entrance of Jadepalace Hotel</i>
	10:50-11:40	Scaling Size & Power in Silicon Photonics Tom Koch <i>Lehigh University, USA</i>
	11:40-12:30	Chip-to-Chip Optical Interconnects Mehdi Asghari <i>Kotura, Inc., USA</i>
	12:30-13:30	<i>Lunch (The Gallery Coffee Shop, 2nd Floor)</i>
PM, August 29 Session Chair : Mehdi Asghari	13:30-14:20	Si MEMS Photonics for Electronics and Photonics Convergence on Si CMOS Platform Kazumi Wada <i>Tokyo University, Japan</i>
	14:20-15:10	A Silicon Photonics Platform with Heterogeneous III-V Integration Wim Bogaerts <i>Ghent University, Belgium</i>
	15:10-15:30	<i>Tea break</i>
	15:30-16:20	Silicon Photonic Devices for on-chip Microsystems Zhiping Zhou <i>Peking University, China</i>
	16:20-17:10	Lotus Surface Structure with ZnO Nanowires for Low Reflection High Efficiency Solar Cells Ching Ping Wong <i>Georgia Institute of Technology, USA</i>
	17:30-20:00	Dinner speech: Si Photonics and China Speaker: Andrew Richman, Chairman, Kotura Inc. (Chao Fu Gong Shi Fu, 2nd Floor)
AM, August 30 Session Chair : Tom Koch	8:30-9:20	A High Speed 4-Channel Integrated Silicon Photonics WDM Link with Hybrid Silicon Lasers Haisheng Rong <i>Intel Corporation, USA</i>
	9:20-10:10	Silicon Based On Chip Photonic Quantum Dots and Photonic Molecules Kunji Chen <i>Nanjing University, China</i>
	10:10-10:30	<i>Tea break</i>
	10:30-11:20	Phosphorus and Boron Doping of Silicon Nanocrystals Deren Yang <i>Zhejiang University, China</i>
	11:20-12:10	Si Nanodot Photonics Lorenzo Pavesi <i>University of Trento, Italy</i>
	12:10-13:30	<i>Lunch (Korean Restaurant, 2nd Floor)</i>
	13:30-14:20	Silicon Based Organic/inorganic Optoelectronic Materials and Application Wei Huang <i>Nanjing University of Posts and Telecommunications, China</i>
	14:20-15:10	Chemical and Biological Sensing with Photonic Crystal Devices Made of Silicon

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29-30 August, 2010

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