

Heterogeneously integrated III-V/Si lasers based on DVS-BCB bonding

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The main interest in silicon-based photonic stems mostly from the expectation that the maturity and low cost of CMOS-technology can be applied for advanced photonics products. Other driving forces for silicon photonics include the design richness associated with high refractive index contrast as well as the potential for integration of photonics with electronics. Building light sources, and in particular laser sources, on integrated silicon circuits is a long sought goal, on one hand in order to complete the functionality of the integrated circuit with one or several light sources but on the other hand also as a manufacturing approach for lasers on large wafers in CMOS-fabs. The most successful approach to date is definitely the hybrid (also called heterogeneous) III-V on silicon laser. Two main technologies are used to heterogeneously integrate III-V epitaxial layer stacks on a silicon waveguide circuit: molecular bonding and adhesive bonding. In the Photonics Research Group – Ghent University / Imec, we focus on adhesive die-to-wafer and wafer-to-wafer processes, based on DVS-BCB as a bonding agent, given the relaxed requirements on the III-V wafer surface quality. In these approaches, unstructured InP-based dies are bonded, epitaxial layers down, on an SOI waveguide circuit wafer, after which the InP growth substrate is removed and the III-V epitaxial film is processed. The laser cavity gets its gain from the III-V layers but couples its output light into a silicon waveguide. Often part of the cavity structure is implemented by means of patterning in silicon, thereby taking advantage of the resolution and accuracy of lithography tools in CMOS fabs. In the recent years a lot of progress has been made in the field of hybrid silicon lasers, in particular with respect to the type of the cavity, the type of light coupling between the silicon layer and degree of the light confinement in the gain layer. In this presentation we will outline our work on the integration of III-V laser sources on a silicon waveguide platform.

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Ottawa Welcomes the Photonics World

We would like to invite you to join us in Ottawa at the [Ottawa Convention Centre](http://ottawaconventioncentre.com/) (<http://ottawaconventioncentre.com/>) for the 15th Photonics North Conference on June 3 – 5, 2013.

Photonics North is now the sole Canadian meeting point between the academic community and the industrial/government sector. This unique gathering will offer many opportunities to share and exchange views and ideas about academic discoveries and industrial needs. Most importantly, sessions on many themes will further facilitate the orientation and design of future strategic research directions for Photonics in Canada.

As in previous years, the program will include the participation of a stellar group of invited researchers representing the latest worldwide trends in photonic research and industry. Finally, Photonics North will also be the main "marketplace" for photonic talent in Canada, from the point of view of job seekers (especially graduate students and postdocs) and offerers (industry, government, academic institutions).

Don't stay in the dark! Start planning now to visit Ottawa next June and help us "Make Light Work for Canada"!

Jacques Albert, Conference Co-Chair – Canada Research Chair in Advanced Photonic Components, Carleton University

Important Dates

January 19th, 2013

-Abstract submission deadline

February 28th, 2013

-Notice of acceptance

April 3rd, 2013

-Early bird registration:

May 31st-June 2nd, 2013

-The International OSA Network of Students

June 3-5, 2013

-Conference

Program Online

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Registration Is Now Open

Belanger, Michel – Ciena, Canada
Software defined coherent transceivers

Cartledge, John C. – Queen's University, Canada
Pulse shaping and pre-compensation in optical systems

Djordjevic, Ivan – University of Arizona, USA
Coding techniques for fiber optic transmission

Essiambre, René-Jean – Alcatel-Lucent, USA
Fiber Capacity and Spatial Multiplexing in Multicore and Multimode Fibers

Glesk, Ivan – University of Strathclyde, UK
Energy aware networks and optical interconnects for data centers

Kavehrad, Mohsen – Penn State University, USA
Free-space optical communications

Krummrich, Peter – Technical University Dortmund, Germany
Optical amplifiers and filters for spatial mode multiplexing

Lu, Zhenguo – National Research Council, Canada
InAs/InP Quantum Dot Comb Sources for Coherent Optical Communications

Maier, Martin – Institut national de la recherche scientifique, Canada
Smart Grid Communications over Next-Generation PONs

Ryf, Roland – Alcatel-Lucent, USA
Transmission over few-mode fiber

Slavik, Radan – University of Southampton, UK
Synthesis of Quadrature Amplitude Modulated (QAM) signals by direct modulation of simple semiconductor lasers under injection locking

Simon, Jean-Claude – École Nationale Supérieure des Sciences Appliquées et de Technologie, France
Quantum well microcavities saturable absorbers and quantum dot mode-locked laser diodes for signal regeneration and clock recovery

Ten, Sergey – Corning, USA
Optical fiber for long haul capacity systems

Wu, Kuang-Tsan – Infinera, Canada
Digital signal processing for super channel optical transmission

Yao, Jianping – University of Ottawa, Canada
UWB an 60 GHz transmission over WDM-PONs

Optoelectronics and Integrated Optics

Hochberg, Michael – University of Delaware, USA / National University of Singapore, Singapore
Integrated Photonics in Silicon

Keyvaninia, Shahram – Ghent University / IMEC, Belgium
Heterogeneously integrated III-V/Si lasers based on DVS-BCB bonding

Knights, Andy – McMaster University, Canada
40Gbps optical link using silicon photonics

Krause, David – Infinera Canada, Canada
Dense III-V Integration: Enabling Optical Superchannels and Flexible Coherent Networks

Moss, Dave – CUDOS, University of Sydney, Australia
CMOS compatible platforms for nonlinear optics in the telecom band

O'Brien, Peter – Tyndall National Institute, Ireland
Review of packaging and integration technologies for Silicon Photonics and implementation of an advanced foundry service

Pinguet, Thierry – Luxtera, USA