

## PhD position on III-V-on-silicon electroabsorption modulators for co-packaged optics

Ghent University – imec, Photonics Research Group  
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### Job context:

Silicon photonics is a field that is maturing and attracting strong interest from industry and academia to realize miniaturized photonic systems for applications in datacommunication and telecommunication, as well as in other emerging fields, such as sensing. For the field of datacommunication, there is a need for highly integrated transceivers, densely integrated with the electronic ASICs. Silicon photonics is well suited for that purpose. However, the platform currently lacks electroabsorption modulators in the O-band. This requires the integration of III-V semiconductors on silicon photonic integrated circuits in a way that is mass manufacturable. The Photonics Research Group, an associated lab of imec, is at the forefront of the research in this area.

### Job description:

As a PhD researcher, you will work in the framework of the FWO project 'Optical I/O as an enabler for the high-performance computers of the future'. The focus of the project is the development a new approach for intra-datacenter optical communication that makes use of co-packaged optics, optical switching and coherent data reception.

A key component in such a system is a high-performance transmitter. It is the goal of this PhD project to realize a prototype of such a device, by integrating an array III-V electroabsorption modulators (EAMs) on a silicon photonic platform, to realize a 56GBaud PAM-4 transmitter that can be densely integrated with a CMOS driver. The III-V devices will be integrated on the silicon photonic integrated circuit by a novel integration method called transfer printing enabling the dense and high throughput integration of III-V opto-electronic devices on a silicon photonic integrated circuit. While the silicon photonic integrated circuits will be processed in the imec 200mm CMOS pilot line, the transfer printing process will be developed by the PhD student in the UGent cleanrooms. After the prototype has been realized it will be first characterized using state of the art measurement facilities at Ghent University, in close collaboration with the high-speed electronics group (IDLAB\_design), after which the device will be packaged and used in a system test bed to demonstrate the new intra-datacenter interconnect concept.

### Profile

You are an ambitious, passionate and talented student. You have recently obtained a master degree in Photonics, Optical communication or Electrical engineering. You have a good understanding of photonic integrated circuit technology and optical networks. You possess good verbal and written English communication skills allowing you to effectively communicate with industrial and academic partners. As an equal opportunity employer, UGent encourages women to pursue careers in science and strongly welcomes female candidates.

## Our offer

In exchange for your talent, passion and expertise, you will get an interesting position in a multicultural and high-tech institute, with challenges for the taking. This is your opportunity to contribute to the technology that will determine the society of tomorrow. We offer a position of 4 year in the Photonics Research Group, imec's associated lab at Ghent University, starting as early as April 2020.

## Application

Please submit your expression of interest with resume and motivation letter by no later than March 1<sup>st</sup> 2020 by applying online through the following link:

[photonics.intec.ugent.be/contact/vacancies/Application.htm](http://photonics.intec.ugent.be/contact/vacancies/Application.htm)

For further information, please contact:

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Photonics Research Group

[www.photonics.intec.ugent.be](http://www.photonics.intec.ugent.be)

## About the Photonics Research Group

The Photonics Research Group (about 85 people) is associated with imec and is part of the Department of Information Technology of Ghent University. The group is headed by Prof. R. Baets and has been active in photonics device research for many years. The other professors in the group are P. Bienstman, W. Bogaerts, B. Kuyken, N. Le Thomas, G. Morthier, G. Roelkens and D. Van Thourhout. The main research directions are silicon nanophotonics, heterogeneous integration, optical communication, photonic (bio) sensors and photonic integrated circuits for biomedical applications in the near-infrared and mid-infrared wavelength range. More in particular, the silicon nanophotonics work focuses on the design and fabrication of SOI - based photonic devices using standard lithographic techniques compatible with CMOS processing. The Photonics Research Group has been coordinating the network of excellence ePIXnet and is involved in a number of EU - projects, including the H2020 projects OMT, TOPHIT, TeraBoard, PIX4Life, MIRPHAB, AQUARIUS and Phresco. Furthermore, the group is partner of the Center for Nano- and Biophotonics of Ghent University and the group has been awarded four ERC Independent Researcher Starting Grants, one ERC Consolidator Grant and one ERC Advanced Investigator Grant.

