

PHD POSITION ON III-V-ON-SILICON TRANSCEIVERS FOR NEXT GENERATION WIDEBAND OPTICAL NETWORKS

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 telecommunication, there is a need for highly integrated coherent transceivers, combining all passive and active functionality on a single chip. 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 MSCA ITN 'Wideband Optical Networks' (WON). WON is a large scale European Training Network sponsored by the Horizon 2020 Marie Skłodowska-Curie actions in which academic and industrial partners provide research training on next generation wideband optical networks. The focus of the project is the development of the optical devices and sub-systems for the network of the future that allow operating over the entire O-band to L-band (1260nm to 1625nm), thereby enabling up to 250 Terabit/s optical communication over a single mode optical fiber.

A key component in such a wideband optical network is an O to L-band coherent transceiver. It is the goal of this PhD project to realize a prototype of such a device, by integrating an array of widely tunable lasers on a silicon photonic integrated circuit that implements the coherent transmitter (dual polarization I/Q modulator operating from O to L-band) and the coherent receiver (90 degree hybrid + high speed photodetectors). Operation at 64 GBaud / 16-QAM is targeted, to reach 400Gbit/s capacity per transceiver. The III-V widely tunable lasers 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, including a coherent testbed, after which the device will be packaged and a field test in a real network will be carried out together with WON consortium partners. The program also offers the opportunity for a longer term stay at one of the consortium partner laboratories.

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.

To be eligible for an ITN PhD position, the candidate should not have worked or studied in Belgium for more than 12 months in a period of 3 years before the start of the PhD project (January 2019). Compensation is according to the rules applicable for Marie Skłodowska - Curie actions. Marie Curie Fellows enjoy the benefits of full social security, competitive monthly living, mobility and family allowance. 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 soon as possible.

APPLICATION

Please submit your expression of interest with resume and motivation letter by no later than March 1st 2019 by applying online through the following link: <http://photonics.intec.ugent.be/contact/vacancies/Application.htm>

MORE INFORMATION:

Contact Prof. Gunther Roelkens
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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 FP7 projects ActPhast, PLAT4M, Cando, and Pocket and the H2020 projects MORPIC, TOPHIT, TeraBoard, PIXapp, PIX4Life, MIRPHAB 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.