



**This project has received
funding from the European
Union's Horizon 2020 research
and innovation programme.**

Post-doc position on mid-IR photonic integrated circuits

Ghent University – imec, Photonics Research Group
Tech Lane Ghent Science Park – Campus A
Technologiepark-Zwijnaarde 126, B-9052 Gent, Belgium

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, telecommunication and sensing, as well as in other emerging fields. While silicon-on-insulator is a mature platform for 1.3-1.55um platform, there is a need for alternative waveguide platforms to address applications outside the telecommunication window. For mid-IR wavelengths (>4um) the Ge-on-Si platform stands out as very valuable platform, due to its CMOS compatibility and wide transparency window. In the past years the Photonics Research Group has been developing such a platform for the 5-8um wavelength range, obtaining low loss waveguides, passive optical functions and thermo-optic tuning. However, currently the platform lacks the possibility to integrate III-V quantum cascade lasers (through flip-chip integration) and systems should be built based on this platform that address real-life sensing applications.

Job description:

You will be working together with industrial and academic partners in the H2020 project HYDROPTICS. The project aims at making use of novel advances in photonics, to provide a set of tools and devices, which allow the reliable and cost-effective monitoring of water quality involved in up- and downstream processing in the oil industry. HYDROPTICS will make use of novel mid-IR light sources, with a focus on quantum cascade frequency combs, in order to do dual comb spectroscopy on water samples to detect the presence of oil contaminants in water. Your goal is to build a miniaturized dual-comb spectrometer, based on the Ge-on-Si waveguide platform and with flip-chip integrated quantum cascade comb sources.

You will design, fabricate and test the required photonic integrated circuits, as well as develop the processes required to enable the flip-chip integration of the quantum cascade lasers (in cooperation with CMST – another imec research group at Ghent University). Towards the end of the project you will interact with the end-users of the sensing system, in order for them to be able to do sensing experiments in real-life situations.

Profile:

You have a PhD in integrated optics, preferably in Silicon Photonics.

You have a strong track record in the design, fabrication and test of photonic integrated circuits. Experience with midIR photonic integrated circuits is a plus.

You have a broad view on photonic sensing applications, the advantages that photonic integration can bring for these applications and well as the challenges that need to be overcome.

You have a good understanding of packaging technologies, flip-chip integration in particular.

You possess strong verbal and written English communication skills allowing you to effectively communicate with industrial and academic partners, also those that are not experts in photonics and photonic integrated circuits.

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 2 year in the Photonics Research Group, imec's associated lab at Ghent University.

Application:

Please submit your expression of interest with resume and motivation letter by no later than Nov 1 2019 by applying online through the following link:

photonics.intec.ugent.be/contact/vacancies/Application.htm

For more information, please contact gunther.roelkens@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, HOT, 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.

