PhD position on III-V-on-silicon integrated spectroscopic gas sensors

UGent/imec - Photonics Research Group
Technologiepark-Zwijnaarde 15, B-9052 Ghent, Belgium
http://photonics.intec.ugent.be/

We are looking for a highly motivated PhD candidate with a background in photonics and or sensing with an interest to do research towards a III-V-on-silicon integrated spectroscopic gas sensors. The project aims at integrating multiple III-V semiconductor lasers operating in the 1.5-2.5 um wavelength range to realize the on-chip detection of several gases (CO2, CO, HCl, HF,...). The project involves the design of the silicon photonic integrated circuit and the integration of multiple III-V layer stacks for realizing the integrated lasers and photodetectors. Wavelength modulation spectroscopy will be used for the sensitive detection of gases. The project also involves the development of the electronic circuits around the optical chip to drive the lasers and read out the integrated photodetectors.

In the context of an INTERREG project these sensors will be evaluated for fire risk assessment. The goal is to realize a small, low weight and robust spectroscopic sensor that can be mounted on a drone to fly over a fire / accident site to assess the amount of toxic gases that are being released, in order to assist firefighters.

We offer you the opportunity to perform cutting-edge research in a challenging, motivating environment, working within a multidisciplinary team consisting of both photonic integration, sensing and electronics experts. A willingness to tackle challenges coming from these multi-disciplinary collaborations is a must.

Application:

Apply by filling in the **application form**.

More information:

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About Photonics Research Group

The Photonics Research Group (about 70 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

applications under study are silicon nanophotonics, heterogeneous integration, optical interconnect, WDM optical communication, silicon photonics biosensors 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 group is also strongly involved in the development of heterogeneous technologies, whereby the silicon photonics platform is combined with other materials such as III-V semiconductors for efficient sources, nanocrystals and polymers.

The photonics research group has been coordinating the network of excellence ePIXnet and is currently involved in a number of EU-projects, including the FP7 projects ActPhast, PLAT4M, Cando and Pocket; and the H2020 projects PIX4life, MIRPHAB, Teraboard and Phresco. Furthermore, the group is partner in the Center for Nano- and Biophotonics of Ghent University and the group has been awarded with three ERC Starting Independent Researcher Grants and one ERC Advanced Investigator Grant.

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