



## PhD position on position on lab-on-chip based Raman spectroscopy for biomedical applications

UGent/imec - Photonics Research Group  
Sint-Pietersnieuwstraat 41, B-9000 Gent, Belgium  
<http://photonics.intec.ugent.be/>

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In recent years we have developed a photonic integration platform based on silicon nitride waveguides for the purpose of molecular sensing, in particular biosensing. The basic underlying concept is to exploit the benefits of tight optical confinement and field enhancement in high-index-contrast waveguides as well as in nanoplasmonic antennas to allow for a very efficient light-matter interaction and thereby enable the collection of Raman Stokes signals from monolayers attached to the waveguide. This work has now led to several proof of concepts.

In the new PhD project we will build upon this platform to address the needs of specific biological or medical applications. To this end the designs of the photonic integrated circuits will be optimized for maximum signal collection and minimum background generation. Especially the latter presents important challenges. Depending on the specific application we can make use of spontaneous Raman scattering, or SERS or a stimulated Raman scattering approach, such as CARS or SECARS. The work will be done in collaboration with biological or biotechnological groups.

### Profile:

- Master of Science degree in Photonics
- Master of Science degree in Electrical Engineering with a focus on photonics
- Master of Science degree in Applied Physics with a focus on photonics

### 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

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many years. The other professors in the group are P. Bienstman, W. Bogaerts, 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, Pocket and SMARTFIBER. 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.