

PHD POSITION ON OPTOMECHANICAL COUPLING OF 2D-MATERIALS AND INTEGRATED PHOTONIC DEVICES

Ghent University – IMEC, Photonics Research Group
Tech Lane Ghent Science Park – Campus A
Technologiepark – Zwijnaarde 15, B-9052 Gent, Belgium

As a PhD researcher, you will work within the framework of the H2020 OMT Project on “Optomechanics Technologies”. OMT 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 the physics and implementation of Optomechanics Technologies. The ETN research focuses on new technologies based on cavity optomechanical interactions that allow to read out and control mechanical oscillators at the quantum level using optical fields. (further details can be found on the project website, see <http://www.omt-etn.net>). Your task in this project will be to investigate the interaction of novel 2D-materials such as graphene, MoS₂ and others with integrated photonic devices.

Electromechanical actuation of graphene and TMD (transition metal dichalcogenides) membranes have already been investigated for some time. We will integrate membranes of 2D-materials with photonic waveguides and cavities and study the optomechanical coupling between the optical field and 2D-membranes, which are promising because of their low mass, high force sensitivity, large zero-point motion and high- nonlinearity. You will thereby rely on the vast experience of the Photonics Research Group in the conception, design, fabrication and characterization of novel integrated photonic devices. Coupling to a 2D membrane from an integrated photonic device will allow to increase the optomechanical coupling strength, reduce the dimensions of the membrane and address novel effects (e.g. lifting of thin membranes has been proposed). You will work closely with other partners in the network and the ETN OMT network will offer the opportunity for a long-term research stay in a partner laboratory, including regular training activities organized by the network (see website).

PROFILE:

To be eligible, the candidate should not have worked nor studied in Belgium for more than 12 months in a period of 3 years before the start of the PhD project. 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.

APPLICATION:

Applications including a motivation letter, CV and BSc and MSc transcripts should be submitted through the online application form at: <http://photonics.intec.ugent.be/contact/vacancies/Application.htm>

MORE INFORMATION:

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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 OMT, TOPHIT, TeraBoard, 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 three ERC Independent Researcher Starting Grants, one ERC Consolidator Grant and one ERC Advanced Investigator Grant.