POSTDOC POSITION ON SILICON-PHOTONICS-BASED HIGH-ACCURACY LIDAR SYSTEMS FOR QUANTUM IMAGING

Ghent University – IMEC
Tech Lane Ghent Science Park – Campus A
Technologiepark-Zwijnaarde 126, B-9052 Gent, Belgium

Context

Imaging and remote sensing protocols in the classical domain are fundamentally limited by the diffraction limit and detection noise. To move beyond these boundaries photonic quantum technologies provide new paradigms for achieving unprecedented sensing performance. The Horizon 2020 SURQUID project aims to achieve both super-resolution below the Rayleigh diffraction limit and super-sensitivity below the shot noise limit for light detection and ranging (lidar) applications, see https://surquid.eu/project/

The imec-UGent Photonics Research Group will be responsible for designing and characterizing the silicon-photonics-based multi-channel receiver chip forming the basis for the quantum homodyne detection system (QHD). Combined with non-classical illumination using entangled coherent states (ECS), this will allow to build a quantum lidar system for multi-scale quantum imaging with unparalleled accuracy and precision.

Job description

As a postdoctoral researcher, you will work in the framework of the H2020 SURQUID project during at least two years.

You will be responsible for the photonic integrated circuit (PIC) design and testing of the multi-channel receiver chip on which project partners will then integrate superconducting single photon detectors. The chip should include highly efficient input couplers and a multiplexing network, compatible with a cryogenic system. You will collaborate intensively with the international project partners to define the chip specifications and, following fabrication, to setup the whole system for characterizing the QHD system.

Profile

- You have a Ph.D. degree in photonics, applied physics or electrical engineering (or equivalent experience).
- You have experience in silicon photonic integrated circuit design

About the Photonics Research Group (PRG)

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 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 two ERC Advanced Investigator Grants.

Application

Use the online form: http://photonics.intec.ugent.be/contact/vacancies/Application.htm

More information

- Prof. Dries Van Thourhout (dries.vanthourhout@ugent.be, see also: http://photonics.intec.ugent.be/contact/people.asp?ID=50)
- https://surquid.eu/project/