

POSTDOC POSITION ON SILICON-PHOTONICS-BASED CHIP-TO-SYSTEM DEVELOPMENT FOR LASER DOPPLER VIBROMETRY IN MEDICAL APPLICATIONS

Ghent University – IMEC
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Context

The H2020 PhotonicLEAP project will develop a disruptive production technology for Photonic IC (PIC) based systems using advanced glass packaging materials and fully automated wafer-level packaging and test processes that can be scaled to very large volumes. PhotonicLEAP will use this disruptive technology to produce a Surface Mount Technology (SMT) PIC package, based on a Ball Grid Array (BGA) design. This approach will reduce the cost of PIC packaging, module integration, and test production by over 10 times, opening up many new markets, overcoming the prohibitively expensive packaging solutions used today.

The imec-UGent Photonics Research Group will be responsible for implementing a silicon-photonics-based demonstrator using the SMT package. This demonstrator uses the PhotonicLEAP package to develop a low-cost multi-beam Laser Doppler Vibrometry (LDV) module for biomedical applications, in particular for the screening of arterial stiffness, detection of stenosis, and heart failure. The LDV system is implemented on a well-developed Silicon Photonics platform, where a hybridly integrated laser is used as an on-chip source. The LDV design will include multiple output optical channels to form a multi-beam interferometric system. The multi-channel LDV system will be packaged using the SMT package and a demonstrator will be made at the end of the project.

Job description

As a post-doc researcher, you will work in the framework of the H2020 PhotonicLeap project during at least two years.

You will be responsible for the photonic integrated circuit (PIC) design and testing for the multi-beam LDV. That includes the gds design of the LDV PIC using IPKISS and sample measurement.

You will also be responsible for the design and implementation of an optical system that is compatible with the multi-beam LDV. The optical system will include micro-optics, which can be fabricated by project partners. You will need to simulate the optical system using Zemax, realize a test bench of the optical system, and do the test after fabrication.

You will also be responsible for the implementation of the demonstrator system, which includes driver electronics preparation and demonstration setup implementation.

During the project, you will also be involved in the development of the packaging process design rules.

Profile

- You have a Ph.D. degree in photonics or electrical engineering (or equivalent experience).
- You have experience in silicon photonic integrated circuit design, preferred using IPKISS.
- It is a plus if you have experience in optics design using ray-tracing software (e.g. Zemax) or experience in electronics design, e.g. for TIA.

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

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