Postdoc position on III-V on silicon modelocked lasers for microwave photonics applications

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

RF frequency downconverters are of key importance in communication satellites. Classically, they are implemented using an electronic mixer. In this project we explore the use of photonic technology to realize the same functionality. The potential advantages of such an approach compared to the classical microwave solutions are that it is lighter weight, has lower power consumption and can be made smaller if photonic technology is used. An additional advantage is the fact that the optical local oscillator (LO) reference can easily be transported over longer distances than the equivalent LO signal in the microwave domain due to the large bandwidth and low loss and dispersion of optical fiber. Another big advantage is that one can envision the use of short pulse trains as the LO – starting off from a sinusoidal RF reference – in order to exploit subsampling. Subsampling avoids the need for high frequency LO references, which is especially valuable if a downconversion over several 10s of GHz is required. For this functionality compact short pulse laser sources are required with low phase noise (jitter). In this project such modelocked laser sources will be implemented on a silicon photonic integrated circuit, using a bonded III-V semiconductor layer for the implementation of the gain and saturable absorber section.

This vacancy is related to a European Space Agency project geared towards the evaluation of photonic technology for telecommunication satellite payloads. The work encompasses the full chain from design of the modelocked laser, over the fabrication of the devices in the Ghent University cleanroom, to the characterization of the device. The detailed RF characterization of the devices is done in collaboration with Antwerp Space, a Belgian company developing high performance demodulators and RF converters.

Application:

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

More information:

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Application deadline: Jan 1, 2015

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, 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.

INTEC Department of Information Technology

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