Position for postdoctoral researcher:

Yield Prediction for Silicon Photonic Circuits

Context:

Silicon Photonics is becoming increasingly industrialized, with the first applications already in the market. It holds a great promise because the CMOS manufacturing infrastructure and the submicrometer waveguides can scale up to very large photonic circuits. However, because there is always an intrinsic variability, today's photonic circuits generally consist of only a small number of components. For larger circuits, it becomes very difficult to predict how the circuit will actually behave when the many components exhibit some variability, and it is impossible to assess how many circuits on a silicon wafer (or in a batch of wafers) will actually work within specifications.

The MEPIC project is a collaboration between *Luceda Photonics* (a startup-company building design solutions for photonic integrated circuits) and two groups in Ghent University: The *Photonics Research Group* (PRG) is a world leader in silicon photonics, and the *Surrogate Modelling* (SUMO) group is well known for its extensive toolbox for modelling real-world processes in different fields. In the MEPIC project they develop together the techniques to build models for photonic circuits that encapsulate the effect of variability and allow the prediction of fabrication yield. The company *Caliopa* (a Ghent University spin-off, now part of Huawei) is an end-user in this project.

Vacancy:

The *Photonics Research Group* (PRG) is looking for a postdoctoral researcher in the context of the MEPIC project. Your primary role will be the coordination of the MEPIC work on the side of the PRG, and be responsible for the translation of general research results to specific target of MEPIC. Your focus will be to coordinate (as well as execute part of) the work on model building for basic photonic building blocks, by describing the ideal behavior as well as the stochastic variability. This will involve the complete process: simulation, design, fabrication (through multi-project-wafer services in IMEC) and characterization. Based on these models, it is the objective to build a framework for yield prediction based on stochastic simulation (e.g. Monte-Carlo). This will also be experimentally validated. Within the PRG, you will be part of the small team of prof. Wim Bogaerts which works on the overall challenges for large-scale photonic integration.

The work in the context of MEPIC will be in close collaboration with the team of Luceda Photonics, so you will also be able to experience the operations of a young start-up company.

Profile:

You have obtained a PhD in photonics, applied physics or electrical engineering. You have a solid background in the field of photonics, and preferably integrated photonics: you are familiar with the concepts of waveguides, directional couplers, and other elemental photonic building blocks. You have experience with some commonly used modelling and design tools (e.g. Luceda, Lumerical, Phoenix, Photon Design.). You should have some affinity for scripting and/or programming, as this will be at the heart of the work: the primary toolkits are based on Python and Matlab. The work in MEPIC fits in the context of a larger team and will interface between different groups and companies (PRG, SUMO, Luceda and Caliopa). Good communication skills and a healthy interest beyond the pure academic research is essential. Experience with project management and team management are relevant, and there will be opportunities to develop these skills further in this position.

Contact:

Prof. Wim Bogaerts (Photonics Research Group)

wim.bogaerts@ugent.be

Start Date: 1 September 2016

Duration: 2-3 years