Universität Karlsruhe (TH)
Forschungsuniversität · gegründet 1825

Institut für Photonik und Quantenelektronik

Vortrag

Zeit: 14.00 Uhr
Ort: HS 9, Geb. 20.40 (Architekturgebäude)

Dr. ir. Wim Bogaerts
Ghent University - IMEC
Department of Information Technology

Silicon Photonics at IMEC

Kurzbiografie

Wim Bogaerts graduated in engineering (applied physics) at Ghent University in June 1998. He joined the department of information technology (INTEC) at both Ghent University and IMEC as a PhD student in the photonics research group of prof. Baets, where he specialised in the modelling, design and fabrication of nanophotonic components, and especially photonic crystals. He expanded his research into the gereral field of silicon nanophotonics, co-ordinating the activities between the photonics group and the silicon process technology group in IMEC for the fabrication of SOI photonic nanostructures with advanced CMOS tools. On this subject, he attained his PhD in April 2004.
Currently he is still active in the photonics group as a postdoctoral researcher of the Flemish Science Foundation (FWO), coordinating the silicon photonics work, with a stronger focus on active elements and integration of silicon photonics with other technologies.
He keeps a strong interest in telecommunications, information technology and applied sciences. He is a member of IEEE-LEOS, Optical Society of America (OSA) and the Flemish Engineering Society (KVIV).

Zum Inhalt

In the last decade, silicon photonics has grown from a niche research field to a technology which is now getting increasingly industrial relevance. This is because of two key features of silicon photonics: The Silicon/SiO2 material system has proven to be ideal for scaling down optical waveguides, because of the high refractive index contrast. This allows waveguides with submicron core sizes, but also strong diffractive structures such as photonic crystals. The high refractive index contrast of silicon waveguides has been used to demonstrate many new phenomena which require a very strong optical confinement of light in a waveguide. The second strong point of silicon photonics is that the photonic circuits can be made with the same tools as used for microelectronics fabrication. These tools are exceptionally optimized for high-volume-low-cost fabrication of deep submicron patterns with high accuracy and yield. As a a world-leading microelectronics research center with state-of-the-art CMOS clean-rooms, IMEC is ideally positioned to explore the bàoundaries of silicon photonics. The photonics research group, which has been breaking ground for several decades in different fields of integrated optics, has started the silicon photonics activity in IMEC ten years ago, by developing processes based on high-end optical projection lithography at 248nm and 193nm (so-called deep UV lithography) for the fabrication of optical circuits in silicon-on-insulator. Since then, IMEC has been pioneering the field of silicon photonics, not only by introducing new silicon waveguide devices and functionalities as well as integrating the worlds of silicon and III-V semiconductors. Also, from the beginning IMEC has been working to use its tools to the maximum extent, opening its fabrication capabilities to new partners. This has led to ePIXfab, a joint initative between IMEC and LETI, where advanced CMOS-compatible fabrication facilitites are used for photonic circuits designed by a multitude of research groups and even companies worldwide.

Prof. J. Leuthold, Prof. W. Freude
Institute of Photonics and Quantum Electronics

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