

[Plenary Talk |] 20 years of Silicon Photonics – Lessons learned, lessons to be learned

Date & Time	July 3 (Tue.) / 09:15-10:00 (45')	Place	Halla Hall, 3F
Speaker	Roel Baets (Ghent University - imec)		

Biography

Roel Baets is full professor at Ghent University (UGent) and is also associated with IMEC. He received an MSc degree in Electrical Engineering from UGent in 1980 and a second MSc degree from Stanford University in 1981. He received a PhD degree from UGent in 1984. From 1984 till 1989 he held a postdoctoral position at IMEC. Since 1989 he has been a professor in the Faculty of Engineering and Architecture of UGent where he founded the Photonics Research Group. From 1990 till 1994 he has also been a part-time professor at Delft University of Technology and from 2004 till 2008 at Eindhoven University of Technology.

Roel Baets has mainly worked in the field of integrated photonics. He has made contributions to research on photonic integrated circuits, both in III-V semiconductors and in silicon, as well as their applications in telecom, datacom, sensing and medicine. Web of Science reports over 600 publications with an h-index over 60.

As part of a team of 8 professors Roel Baets leads the Photonics Research Group. With about 90 researchers this group is involved in numerous (inter)national research programs and has created four spin-off companies. The silicon photonics activities of the group are part of a joint research initiative with IMEC.

Roel Baets has led major research projects in silicon photonics in Europe. In 2006 he founded ePIXfab, the globally first Multi-Project-Wafer service for silicon photonics. Since then ePIXfab has evolved to become the European Silicon Photonics Alliance. Roel Baets is also director of the multidisciplinary Center for Nano- and Biophotonics (NB Photonics) at UGent, founded in 2010. He was co-founder of the European MSc programme in Photonics.

Roel Baets is an ERC grantee of the European Research Council and a Methusalem grantee of the Flemish government. He is a Fellow of the IEEE, of the European Optical Society (EOS) and of the Optical Society (OSA). He is also a member of the Royal Flemish Academy of Belgium for Sciences and the Arts.

Abstract

In less than 20 years silicon photonics has evolved from a research curiosity to an industry-relevant field with products in the marketplace. Silicon photonics takes advantage of the maturity and existing manufacturing infrastructure of the silicon CMOS world to implement photonic functions, including wavelength-selective functions, high speed modulators or detectors, fiber-coupling structures, sensing structures etc. One of the key challenges in this field has been to develop photonic structures with nanometer-level geometric accuracy, a requirement which is different from the electronic IC world. The key business driver for silicon photonics is the high speed optical transceiver for short-reach interconnect with aggregate data rates of 100 Gb/s and higher. However increasingly other products are emerging, on one hand in high-end telecom products and on the other hand in a variety of sensing applications.

In spite of these exciting developments important challenges still lay ahead, not only with respect to unsolved technical issues such as wafer-level light source integration, but also in the barriers that at photonics-agnostic end-users experience when accessing the silicon photonics supply chain.