

# SEMICON® EUROPA

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## Integrated Photonics

**Advanced Photonic Integrated Circuits solutions with integrated lasers for ultimate optical connectivity in Datacenters, HPC and 5G**



P. Langlois  
Chairman of the board  
Scintil Photonics, management, Grenoble, France



### Abstract

**Scintil Photonics develops and markets Photonic Integrated Circuits (PICs): integrated laser arrays, multiples of 800 Gbit/sec transmitters and receivers, tunable transmitters, and receivers, as well as optical I/O for near chip and chip-chip communication). Its circuits are fabricated on a proprietary III/V-Augmented Silicon Photonics technology manufactured in a multi-customer silicon foundry. For accelerated adoption, the company also delivers the control electronics and reference package implementations. Based in Grenoble, France, and Toronto, Canada, Scintil is currently taking its innovative product to industrial level as it gears up for mass production. [www.scintil-photonics.com](http://www.scintil-photonics.com)**

### Unique value proposition

Scintil Photonics is focusing its efforts on ultra-high speed optical communication circuits for Datacenter interconnect and High-Performance Computing cloud systems. We deliver sustainable data rate, high volume production capability, while offering 40 percent power reduction.

### Value chain

As a supplier of optical components, our circuits integrate all the optical components required to make an optical communication (lasers, modulators) We sell our circuits to equipment manufacturers in networking or high-performance computing equipment or we can sell them customers which integrate our circuits into modules. Our customers directly sell their equipment or modules to datacenters and telecom operators

### Unique technology

We develop Disruptive Photonic Integrated Circuits for ultra-high-speed optical communications, exploiting a technology developed at Cea Leti. We have demonstrated high performance prototypes fabricate from our commercial foundry over the last 3 years. Some successful reliability tests were performed on our prototypes have proven reliability of the technology. SCINTIL circuit technology combines the best of III-V material and silicon photonics by molecular bonding III-V material at the backside of an already processed silicon photonic wafer. This makes us uniquely capable of integrating multiple lasers on advanced silicon photonic circuits and because one laser can carry 100 Gbit/sec and more, we can deliver ultra-high speed performances and our circuit technology leverages silicon photonic processes available in several commercial foundries. Therefore, our circuits can be supplied in volume.

**Biography**

Pascal LANGLOIS cofounded Scintil Photonics on November 2018 with Sylvie Menezo president and CEO. He is serving as chairman of the board. Most recently, Langlois was President and CEO of Tronics Microsystems, a Mems company he introduces in 2015 on Euronext Stock market, and which was acquired by TDK Group end of 2016. Prior to that he was Chief Sales and Marketing Officer at ST-Ericsson and from 2006, Founder of NXP and part of the executive management team responsible for global sales. He was previously with Philips Semiconductors BV, where he served in various capacities, including Senior VP of Sales and Marketing for multimarket products and VP of the automotive global market segment. He also worked with VLSI Technology, where his last position was VP for Europe, Asia Pacific and Japan operations. Pascal graduated with a Bachelor in technology from the University of Paris, and attended strategy and organization executive program from Stanford University. Langlois is also Chairman of supervisory board of Teem Photonics, an industrial laser company and Director of Yole Development, a market research firm.

## Spectral sensing with photonic chips



A. Fiore  
Professor  
Eindhoven University of Technology, Applied  
Physics, Eindhoven, The Netherlands



### Abstract

In this talk I will present an integrated photonic technology for near-infrared spectral sensing, and its applications in the agrofood and recycling sectors

### Biography

Andrea Fiore holds a PhD degree in Optics from the University of Orsay, and has previously worked in Thales Research and Technology (Orsay, France), at the University of California at Santa Barbara, at the Italian National Research Council (Rome, Italy), and at the Ecole Polytechnique Fédérale de Lausanne (Switzerland). Since 2008 he holds a chair at the Eindhoven University of Technology, The Netherlands. Prof. Fiore has been the recipient of the 'Professeur boursier' (Switzerland) and 'Vici' (The Netherlands) personal grants, and has been awarded the 2006 ISCS 'Young Scientist' Award (International Symposium on Compound Semiconductors). He has acted as principal investigator in several national projects, team leader in six EU projects, coordinator of EU-FP6 project 'SINPHONIA' and of the Dutch FOM national program 'Nanoscale Quantum Optics'. He is presently leading a large NWO Gravitation program on Integrated Nanophotonics. He has coauthored over 180 journal articles and given around 60 invited talks at international conferences. He is also the cofounder of two TU/e spin-offs, nanoPHAB and MantiSpectra.

## Heterogeneously integrated InP-laser on Silicon Photonics realized by micro-transfer printing



S. Ghosh  
Researcher  
Tyndall National Institute, III-V Materials and  
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### Abstract

Silicon photonics have gained immense commercial interest in data-center market and soon it will enter other domains as well including biomedical, space applications and so on. Silicon being an indirect bandgap semiconductor efficient lasing cannot be achieved. Therefore, hybrid or heterogeneous integration techniques are normally used to incorporate laser with silicon photonics (SiP) platform. These techniques of integrating lasers on SiP platform are far from ideal in-terms of volume, cost and yield. Micro-transfer printing is an emerging technology which enables massively parallel integration with high yield and hence bring the cost down. In this talk transfer printing of InP-based laser on SiP chip will be presented.

### Biography

Samir Ghosh obtained his Ph.D. degree in Photonics Engineering from Ghent University, Gent, Belgium in 2013. Afterwards he worked at various academic institutes as a postdoctoral researcher including McGill University – Canada, University of California - Davis, The University of Tokyo - Japan, and Nanyang Technological University - Singapore. Since October, 2020 he is working as a researcher at Tyndall National Institute, Cork, Ireland where his primary interest lies on heterogeneous integration of InP, LN-based devices on Si-Photonics platform utilizing micro-transfer printing technology. He has (co-) authored of 30 publications in referred journals and in international conference proceedings. His broad research interests include large-scale photonic integrated circuit for communication, sensing and imaging applications.

## Next generation microchips, powered by light



R. Penning de Vries  
Chairman of the Supervisory Board  
PhotonDelta, Eindhoven, The Netherlands



### Abstract

Coming soon

### Biography

René Penning de Vries, PhD, has been employed by Royal Philips NV and subsequently NXP Semiconductors as Chief Technology Officer and as CEO of NXP Netherlands.

Since 2012 René has taken up various public sector roles with the aim of fostering of innovation. René has acted a Chairman of various initiatives such as Dutch Digital Delta, Health Valley and the BOM (Regional Development Agency for the province of Brabant).

Currently René is chair of the SVB of the St Maartenskliniek, a specialized clinic for posture and movement. Next to this, René is involved with the Novio Tech Campus in Nijmegen and advises the Knowledge and Innovation Committee (KIC) in NWO (Netherlands Organisation for Scientific Research).

Since early 2018, René is the Chairman of the Supervisory Board of PhotonDelta, which oversees the national initiative on Integrated Photonics.

## **Silicon Nitride based low loss Photonics Integrated Circuits**

T. Hessler  
CEO  
Ligentec SA, Ecublens, Switzerland

### **Abstract**

SiN has been in discussion for a long time as the perfect material for integrated photonics due to its low propagation losses, but SiN layers were limited in thickness. LIGENTEC has developed a unique way to manufacture thick SiN layers and offers a set of SiN layer stacks for different applications. This enables the manufacturing of PICs at much lower losses, better performance, and lower cost than other common approaches. In addition, LIGENTEC's processes for the thick SiN have been developed to be fully compatible with standard CMOS equipment, thus allowing it to leverage existing infrastructure from the semiconductor industry.

We will present the LIGENTEC offering for low loss silicon nitride PICs for applications such as quantum computing, LiDAR sensors for autonomous driving and biomedical sensing applications. Options of active integration are discussed. The offering includes fast R&D cycles in low volume PIC fabrication through multi-project wafer runs to high volume PIC fabrication in an automotive qualified CMOS line.

### **Biography**

Thomas Hessler CEO of LIGENTEC SA, a Swiss rooted company providing low loss Photonic Integrated Circuits. Prior to LIGENTEC, he was a general manager of Axetris AG. He grew this high-tech corporate start-up as employee No 1 and developed it to a market segment leader in wafer level micro-optics and optical gas sensing for communication, medical, industrial, and automotive applications. He studied physics at Constance University and got his PhD in Applied Optics with the Institute of Microtechnology, University of Neuchâtel and the Paul Scherrer Institute. Thomas has a broad experience in various fields of photonics and sensors, including free space, refractive and diffractive micro-optics, optical gas sensing, laser spectroscopy, microfluidics, cell analytics, and integrated photonics. He is also a Member of the Board of Swissphotonics Association and MIRO Analytical AG, an environmental gas monitor company.