

7-8 September 2022

EPIC MEETING ON CMOS
COMPATIBLE INTEGRATED
PHOTONICS at IMEC

Leuven, Belgium

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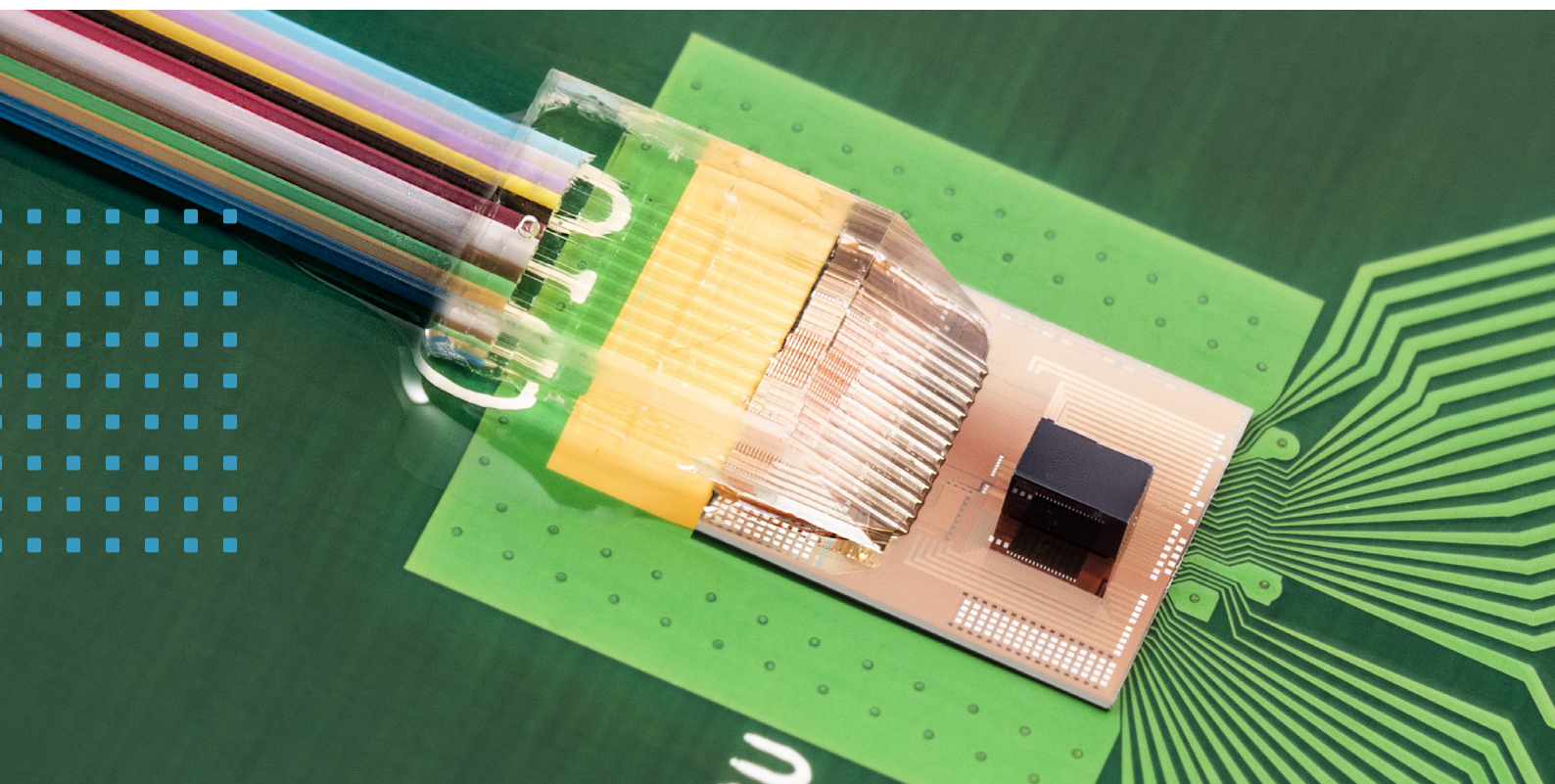
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EPIC Meeting on CMOS Compatible Integrated Photonics at imec

7-8 September 2022 – Leuven, Belgium

The EPIC Meeting on CMOS compatible integrated photonics at imec will bring together CMOS/Silicon/Electronics/MEMs foundries and manufacturers and providers of new materials with photonic functionality (Graphene, III-V, plasmonic structures, BTO, etc.) to address the needs to start new collaborations. The incorporation of new materials with photonic functionality to CMOS processing has been traditionally challenging. However recently, there has been major interest in bringing the developments in photonics to mass production, and for that, working closer to semiconductor companies is a necessary step.

Some of the recent trends are for example, the mass production of coherent transceivers for FMCW LiDAR, efficient detectors based on Quantum dots for next generation imagers, Intel hybrid III-V/Si laser integration, Graphene flagship, and GF 300mm platform. At this meeting we would like the necessary steps to start new collaborations towards pilot production of these hybrid new platforms. Challenges to be addressed, such as through silicon/glass vias, wafer bonding, wafer testing, packaging & assembly as well as new market driven applications that demand the functionality beyond the state of the art.

Tuesday, 6 September 2022

19:00 – 21:00 **Pre-event dinner for early arrivals @Faculty club**
Optional, reservation needed: Address: Groot Begijnhof 14 – 3000 Leuven

Wednesday, 7 September 2022

12:00 – 13:00 **Registration & Lunch @ imec 1**
Address: Kapeldreef 75 – 3001 Heverlee

13:00 – 13:05 **Welcoming words by Ivan Nikitski,**
Photonics Technology Manager at EPIC

13:05 – 13:15 **Welcoming words by Sri Samavedam,**
Senior Vice President of CMOS Technologies at imec

SESSION 1 – PIC PLATFORMS

13:15 – 13:45 **Silicon Photonics Platform: Current and Future Offerings**
Philippe Absil, Vice President R&D at imec (Belgium)

13:45 – 14:15 **Heterogeneous Integration Overview, including Upcoming Tech**
Dries Van Thourhout, Professor at Photonics Research Group, Ghent University/imec (Belgium)

14:15 – 14:30 **Indium Phosphide Integrated Photonics for CMOS**
Kevin Williams, Professor at TU Eindhoven (The Netherlands)

14:30 – 14:45 **Advances in Hybrid Low-loss PICs: the Best of Both Worlds**
Douwe Geuzebroek, VP Marketing & Sales at LioniX (The Netherlands)

14:45 – 15:30 **Coffee break – Networking**

SESSION 2 – PIC ECOSYSTEM

- 15:30 – 16:00 **Integrated Photonic Packaging – From Research to Pilot Manufacturing**
Peter O'Brien, Head of Research Group at Tyndall National Institute (Ireland)
- 16:00 – 16:15 **Silicon Photonics and Electronics for High-Speed Transceivers**
Peter Ossieur, Senior Researcher at imec (Belgium)
- 16:15 – 16:30 **Designing Photonic ICs**
Pieter Dumon, Co-founder and CTO at Luceda Photonics (Belgium)
- 16:30 – 16:45 **Productizing a PIC: from Design IP to Scalable Testing**
Iñigo Artundo, CEO at VLC (Spain)
- 16:45 – 17:00 **Break**
- 17:00 – 17:30 **Photonic Integration and Pathfinding with Intel FPGAs**
Conor O'Keeffe, Principal Engineer at Intel (Ireland)
- 17:30 – 17:45 **Silicon Photonics for Telecom and Beyond**
Tom Janssens, Team Leader Silicon Processing at Huawei (Belgium)
- 17:45 – 18:00 **Holistic Transformation in High Volume Manufacturing of Data Center Transceivers**
Tolga Tekin, Group Manager at Fraunhofer IZM (Germany)
- 18:00 – 18:15 **Optical Interconnect in Co-Packaged Optics System**
Tiger Ninomiya, Senior Technologist at SENKO (USA)
- 18:30 – 19:00 **Bus transfer from imec to dinner venue**
- 19:00 – 22:00 **Networking Dinner @Lemaire room, Faculty Club**
Address: Groot Begijnhof 14 – 3000 Leuven
- 22:00 **Walk to the Hotel**

Thursday, 8 September 2022

- 08:00 – 08:15 **Walk from Hotel to imec**
- 08:15 – 08:50 **Morning Coffee & Networking @imec**

SESSION 3 – NEW MATERIALS IN PICS

- 08:50 – 09:00 **Recap of Day 1** by Ivan Nikitski, Photonics Technology Manager at EPIC (France)
- 09:00 – 09:30 **Foundry Based Electro-Optic Polymer Modulators**
Michael Lebbby, CEO at Lightwave Logic (USA)
- 09:30 – 09:45 **Meta-surfaces Process Scale-up for Advanced Optical Applications**
Philippe Soussan, Technology Director at imec (Belgium)
- 09:45 – 10:00 **3D Printing of Glass Micro-devices for Integrated Photonics and Miniaturized Optics**
Rolando Ferrini, Chief Regional Officer at FEMTOprint (Switzerland)
- 10:00 – 10:15 **Integrating New Materials into Silicon Photonics**
Stephan Suckow, Head of Nanophotonics Group at AMO (Germany)
- 10:15 – 10:30 **Graphene for Integrated Photonics**
Cedric Huyghebaert, CTO at Black Semiconductor (Germany)

10:30 – 11:15 **Coffee Break – Networking**

SESSION 4 –EMERGING APPLICATIONS FOR PICS

- 11:15 – 11:45 **A Call for Technology Innovations to Enable the Metaverse**
Yiwan Wong, Director of Technology Partnerships, Reality Labs at Meta (USA)
- 11:45 – 12:00 **Emerging Applications from Sensing to AI**
Eleonore Hardy, Business Developer Silicon Photonics at CEA – Leti (France)
- 12:00 – 12:15 **MicroLED Display Integration on 300mm Advanced CMOS Platform**
Soeren Steudel, Co-founder & CTO at MICLEDI (Belgium)
- 12:15 – 12:30 **III/V-on-Si based Single-Chip Beam Scanner LiDAR**
Kyoungho Ha, Electronics Principal Engineer at Samsung (South Korea)
- 12:30 – 12:45 **Photonic Integrated Circuit based FMCW LiDAR for Automotive and Industrial Applications**
Frank Gindele, Head of Optics & Mechanics at Scantinel (Germany)
- 12:45 – 13:00 **Medical Applications of Integrated Photonics**
MedPhab Pilot Line Use Cases – Antonio Castelo, Photonics Technology Manager at EPIC (Spain)
- 13:00 – 13:15 **Continuous Multi-Metabolite Monitor**
Danaë Delbeke, CEO at Indigo (Belgium)
- 13:15 – 14:30 **Lunch – Networking**
- 14:30 – 16:00 **COMPANY VISIT of imec**

End & Departures

- 16:00 – 16:30 **Bus 1** (imec to Brussels airport)
- 17:00 – 17:30 **Bus 2** (imec to Brussels airport)

» CONTACTS

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Ivan Nikitski, Photonics Technology Manager at EPIC, mobile: +33 699 644563

Participants

Name	Surname	Job Title	Company	Country
Alexander	Hartwig	Application Field Engineer	DELO	Germany
Amin	Abbasi	Business Manager	imec	Belgium
Ana Belen	Gonzalez Guerrero	Director of Strategic Partnerships	iPRONICS	Spain
Antonio	Castelo	Photonics Technology Manager	EPIC	Spain
Benedetto	Troia	Product Lead	Huawei Technologies Belgium	Belgium
Camiel	Op de Beeck	Customer Project Engineer	LIGENTEC	Switzerland
Carlos	Viana	CEO	ICON Photonics	France
Carol	de Vries	Program Manager Technology	PhotonDelta	The Netherlands
Cedric	Huyghebaert	CTO	Black Semiconductor	Germany
Chris	Lewins	Integrated Photonics Designer	Oxford Ionics	United Kingdom
Conor	O'Keeffe	Principal Engineer	Intel	Ireland
Cyril	Vancura	Director	imec.xpand	Belgium
Danaë	Delbeke	CEO	Indigo	Belgium
Daniela	Diamare	Integration Engineer	Huawei Technologies Belgium	Belgium
David	Castrillo	Business Development	Hamamatsu Photonics	Spain
Douwe	Geuzebroek	VP Marketing and Sales	Lionix	The Netherlands
Dries	Van Thourhout	Professor	imec & Ghent University	Belgium
Eléonore	Hardy	BD Silicon Photonics	CEA-Leti	France
Elisenda	Lara	Marketing Manager	EPIC	Spain
Eva	Ryckeboer	Business Developer	Ghent University	Belgium
Frank	Gindele	Head of Optics and Mechanics	Scantinel Photonics	Germany
Gerwin	Puppels	Managing Director	RiverD International	The Netherlands
Giovanni	Cotella	Project Manager	Huawei Technologies UK	United Kingdom
Helena	Jelinkova	Events Manager	EPIC	Czech Republic
Holger	Quast	VP Materials and Biophotonics	TOPTICA Photonics	Germany
Huiwin	Wang	Director	ETSC	Belgium
Iman	Sabri Alirezaei	Engineer Chip Design & Technology	First Sensor	Germany
Iñigo	Artundo	CEO	VLC Photonics	Spain
Ivan	Nikitski	Photonics Technology Manager	EPIC	France
Joaquin	Faneca	Researcher	IMB-CNM	Spain
Joerg	Smolenski	Business Development Manager	Nanoscribe	Germany
Joost	van Kerkhof	COO	PHIX	The Netherlands
Jyri	Hämäläinen	Head of PM & Marketing	Emberion	Finland
Kevin	Williams	Professor	TUE / JePPIX	The Netherlands

Name	Surname	Job Title	Company	Country
Kyongho	Ha	Electronics Principal Engineer	Samsung	South Korea
Lucia	D'Urzo	Sr. Marketing Manager	SCREEN	Germany
Marco	Lamponi	CEO	Nubis	Belgium
Mark	Goebel	Technology Fellow	Merck	Germany
Michael	Scholles	Head of Fraunhofer Center MEOS	Fraunhofer IPMS	Germany
Michael	Lebby	CEO	Lightwavelogic	USA
Myun-Sik	Kim	Principal Strategic BD	Axetris	Switzerland
Nora	Maene	Business Development Manager	imec	Belgium
Pascual	Muñoz	Director	UPVfab	Spain
Peter	Harmsma	Senior Scientist	TNO	The Netherlands
Peter	Unterwaditzer	Technology Owner MMA	Besi	Austria
Peter	Rajec	Head of Sales & Application	Axetris	Switzerland
Peter	Ossieur	Senior Researcher & Program Manager	imec	Belgium
Peter	O'Brien	Professor	Tyndall	Ireland
Philippe	Absil	VP R&D	imec	Belgium
Philippe	Soussan	Program Director	imec	Belgium



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Name	Surname	Job Title	Company	Country
Pieter	Dumon	CTO	Luceda	Belgium
Rolando	Ferrini	Chief Regional Officer	FEMTOprint	Switzerland
Ruud	Oldenbeuving	Principal Member Of Technical Staff	imec	The Netherlands
Soeren	Steudel	CTO	Micledi Microdisplays	Belgium
Stefan	Schmid	Technology Owner Hybrid Bonding	Besi	The Netherlands
Stephan	Suckow	Head of Nanophotonics Group	Amo	Germany
Teo Leng	Phua	Strategic BD Manager	Delo Industrial Adhesives	Singapore
Theodore	Marescaux	Founder & CEO	Swave	Belgium
Tiger	Ninomiya	Senior Technologist	SENKO	USA
Tolga	Tekin	Group Manager	Fraunhofer IZM	Germany
Tom	Janssens	Team Leader Silicon Processing	Huawei Technologies Belgium	Belgium
Wilfried	Noell	Director R&D	SUSS MicroOptics	Switzerland
Wim	Bogaerts	Professor	Ghent University / imec	Belgium
Yasar	Kutuvantavida	R&D	Huawei Technologies Germany	Germany
Yiwan	Wong	Director Technology Partnerships	Meta	USA
Zheng	Han	Sr Technology Cooperation Manager	Huawei Technologies France	France


Want to make your indium phosphide PICs ready for manufacturing?
The JePPIX Pilot Line provides a single point of contact for

JePPIX
Pilot Line


Design

 Translate your application into an optimized PIC design ready for (large scale) manufacturing.

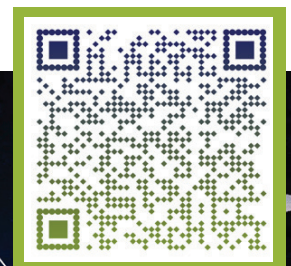
Manufacturing

 Robust and reproducible fabrication of customized PICs.

Testing

 Automated characterization and testing for your chips straight out of the fab.

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Demonstrator Open Call
by scanning the QR-code.





AMO is a research service provider for nanofabrication with focused research & development, prototyping and contract manufacturing. AMO's mission as a research-oriented company is to efficiently close the gap between university research and industrial application. For this purpose, AMO identifies those topics from basic research that seem particularly suitable for industrial implementation and demonstrates these in application-oriented technology. In joint projects and bilateral cooperation, research and development results are transferred to industry for maintenance and creation of jobs. Thus, nanotechnology is expected to provide considerable potential for application areas such as information technology, biotechnology and environmental technology. AMO's competences are nanofabrication, nanoelectronics, nanophotonics, and biotechnology. Nanostructures can now be manufactured in the size of biomolecules, thereby opening the possibility of highly exact analytical methods and the coupling of technology with the biological world. The key to enter the nanocosmos is the production technology for smallest structures. Headed by Prof. Max Lemme, AMO operates a high level 400 m² cleanroom. Furthermore, AMO offers a range of services from consulting to prototype development. www.amo.de



Stephan Suckow (Head of Nanophotonics Group) obtained his B.Sc. and M.Sc. in Physics of Semiconductor Technology from the BTU Cottbus, Germany, and his PhD in Physics from RWTH Aachen University in 2012 on the simulation of photonic silicon nanostructures. He joined AMO in 2015, became the vice head of the Nanophotonics group in 2018 and is leading the group since 2022. He coordinates the H2020 project POSEIDON, is the technical manager of the H2020 Project GRACED and coordinates the work at AMO for several other national and European funded projects.



Axetris serves OEM customers with micro technology based (MEMS) infrared light sources, laser gas sensors, gas flow sensors & controllers and micro-optical components used in industrial, telecom, environmental, medical and automotive applications. Our multi-disciplinary and highly skilled engineering and manufacturing teams combine broad experience in design, manufacturing and metrology from MEMS components to advanced optical and electronic sensor modules. Axetris supports its customers with in-depth application know-how. Customers benefit from excellent product value, consistent high product quality and outstanding customer support. OEMs rely on Axetris worldwide as a competent partner for customer-specific solutions from concept to volume production. Axetris is ISO 9001:2015 certified and ISO TS 16949 compliant and operates its own 6-inch to 8-inch wafer MEMS foundry for its own products and contract manufacturing for external customers. A wafer back end, a sensor assembly and calibration facility under clean room conditions completes the manufacturing infrastructure of Axetris. www.axetris.com



Myun-Sik Kim (Principal Strategic Business Development) received a PhD in Photonics from École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, in 2011. Since January 2019, he works at Axetris Micro-Optics business unit at several roles. Application Engineer Team Manager, Product Manager, and currently he serves as Principal Strategic Business Development questing future markets and applications of Axetris Micro-optics products. His expertise is Micro-optics and its applications (e.g., telecom & datacom transceivers and 3D imaging devices like LIDAR and light-field camera). While working at EPFL and UCSD as a scientific staff, he authored 29 peer-reviewed internal journals, many SPIE proceedings, and a book chapter edited by Prof. Emil Wolf, "Progress in Optics volume 58, 2013."



Peter Rajec (Head of Sales & Application, Micro-optics & Services) joined Axetris in 2013 and is currently the Head of Sales & Application. Prior to this role he worked with u2t Photonics in Sales & Marketing in Berlin, with eGTRAN in Berlin & Taipei, and with Infineon Technologies as Senior Process Engineering building optical subassemblies and modules. Peter started his career with Molex as Prototype Engineer with expertise on thick film designs and manufacturing just after his Master degree in Microelectronics at Technical University in Kosice, Slovakia.



Black Semiconductor is a Tech-Start-Up based in Aachen, Germany. Our goal is to manufacture and market extremely powerful microchips with integrated electronic-photonic circuits. Based on over 20 years of experience in CMOS, photonic chip development, and pioneering work on graphene technology since 2006, we are in the process of initiating a paradigm shift in chip technology. www.blacksemiconductor.de



Cedric Huyghebaert (CTO) is currently CTO at Black semiconductor a startup which wants to enforce a paradigm shift in chip to chip communication through graphene based photonics. Before that, he acted as Program manager of exploratory processes and modules at imec, dealing with material exploration and early module integration for functional applications. He was the initiator and the technical lead of the 2D experimental Pilot line division in the Graphene Flagship, a project which has the ambition to enforce the adoption of 2D materials by the semiconductor industry. In 1999, he started as a junior researcher in the materials and component analyses group at imec. He studied the oxygen beam interactions during sputtering profiling of semiconductors. He received his PhD in Physics in 2006 at the KULeuven in Belgium. In 2005, he joined imec's pilot line as a support integration engineer, especially dealing with the process contamination control. He was part of the packaging group from end 2007 till begin 2010, working as a senior integration engineer dealing with 3D-stacked IC integration. From 2010 to 2019, he led the nano-applications and –material engineering (NAME) group at imec. He (co-)authored more than 200 peer reviewed journal and conference papers. He has a h-index of 35 and his work was cited >4600 times (google scholar).



BESI (BE Semiconductor Industries N.V.) is a leading supplier of semiconductor assembly equipment for the global semiconductor and electronics industries offering high levels of accuracy, productivity and reliability at a low cost of ownership. Besi develops leading edge assembly processes and equipment for leadframe, substrate and wafer level packaging applications in a wide range of enduser markets including electronics, mobile internet, cloud server, computing, automotive, industrial, LED and solar energy. Customers are primarily leading semiconductor manufacturers, assembly subcontractors and electronics and industrial companies. www.besi.com



Peter Unterwaditzer (Technology Owner Multi Module Attach) is technology owner for Besi's Datacon 2200 evo platform and responsible for all technology related developments on this platform. Peter received his Master's degree (MS, Atomic/Molecular Physics) from the University of Innsbruck, Austria in 2004 and continued as a research scientist in the "ultra cold atoms" field in the USA for another year. After that, he spent most of his professional career developing semiconductor assembly equipment for the global semiconductor and electronics industry. Peter joined Besi in 2015 as Senior Project Manager, managing several accuracy improvement projects and took over technology ownership for the Datacon 2200 evo platform in 2019. Peter is part of Besi's path finding team to define future machine specifications and capabilities needed to support integrated photonics serial manufacturing.



Stefan Schmid (Technology Owner Hybrid Bonding) is Technology Owner for Besi's Chameo Ultra Plus platform and responsible for its short- and longterm roadmap. Stefan received his PhD degree (AMO Physics) from Ulm University, Germany in 2012. He joined Swarovski thereafter as a PVD process expert and continued in various positions within the company's coating department until 2020. In early 2021, Stefan joined the semiconductor industry as the owner of Besi's ultra-accurate bonding technology. In this position he is trying to expand Besi's lead in the field of "die to wafer fusion/hybrid bonding" together with the development team. Therefore he is also very much interested in understanding the growing demand for hybrid bonding within the photonics community.



CEA-Leti is an applied-research Institute located in Grenoble-France and specialized in micro and nano technologies. The 'Optic and Photonic Department' develops technologies in the field of lighting, display, sensing, imaging and communications. The department is integrated over the whole development cycle (Design, Fabrication and Tests), from the material (Si, Ge, III-V) to devices and circuit fabrication (200mm/8" CMOS fab, 100mm/4" III-V fab), packaging and test. In addition to Leti's 1,700 employees, there are more than 250 students involved in research activities, which makes Leti a mainspring of innovation expertise. Leti's portfolio of 1,880 families of patents helps strengthen the competitiveness of its industrial partners.
www.leti.fr



Eleonore Hardy (Business Developer Silicon Photonics) joined CEA-Leti in 2018 as a Business Developer in Silicon Photonics. She holds a dual master's degree in Engineering and followed an MS in Management & Innovation. Eleonore has been working in the optics and photonics industry since 2005 and previously worked for Philips in the Netherlands and for Varioptic (a BU of Corning) in China. During her career, Eleonore has been successful in creating long-term value in lasers in France, China and India for Quantel (Lumibird), and spectrometers in Europe and Asia for Resolution Spectra Systems. Eleonore is dedicated to developing new business opportunities in silicon photonics, especially in communications, sensing and high-performance computing.



DELO is a leading manufacturer of high-tech adhesives and other multifunctional materials as well as the corresponding dispensing and curing equipment. The company's products are mainly used in the automotive, consumer, and industrial electronics industries. They can be found in almost every mobile phone and every second car worldwide, for example in cameras, loudspeakers, electric motors, or sensors. Customers include Bosch, Daimler, Huawei, Osram, Siemens, and Sony. DELO's headquarters are in Windach near Munich, with subsidiaries in China, Japan, Malaysia, Singapore, and the USA as well as representative offices and distributors in numerous other countries. The company has 900 employees and achieved a turnover of 182 million euros in last the fiscal year. www.delo.de



Alexander Hartwig (Application Field Engineer) joined DELO in February 2019 as a Senior Application Engineer. Here, he has deep expertise in the fields of display and photonics. Alexander studied physics at the University of Augsburg.



Teo Leng (Strategic Business Development Manager) currently serves as the Strategic Business Development Manager at DELO Industrial Adhesives, and has accumulated experience in a variety of prior roles, from Process Development to Technical Support to Sales and Marketing. He has deep knowledge in the soldering and adhesive materials that go into components and electronics assemblies. Teo Leng also holds a Bachelor's Degree in Materials Engineering as well as an MBA in Finance from Singapore's Nanyang Technological University.



Emberion manufactures camera products comprising of its unique nanomaterial based infrared sensors with in-house designed custom CMOS read out electronics creating high value at affordable costs. Emberion VS20 camera has a wide spectral range Vis-SWIR (400-2000 nm), frame rate up to 400 fps and high dynamic range. These cameras are based on quantum dot sensors. Typical applications for Emberion cameras include machine vision, e.g. optical sorting and quality control, and demanding surveillance domain. Emberion is a spin-off from Nokia Technologies in 2016 and is co-located in Espoo, Finland and Cambridge UK. www.emberion.com



Jyri Hämäläinen (Head of Product Management and Marketing) is Head of Product Management and Marketing at Emberion. He is also one of the founders of Emberion. In his current role he is in charge of Emberion's product portfolio, future business directions as well as all marketing activities. Previously, as Director of Sales and Marketing he was responsible for all commercial activities within Emberion. Before incubating Emberion he worked at Nokia taking the leading edge innovations from Nokia's technology group commercial.



ETSC Technologies is an industry-leading company headquartered in Louvain-la-Neuve, Belgium since 2014, developing and manufacturing next-generation high-precision opto-electrical products for industrial applications as well as cutting-edge research in telecommunication, civil engineering, medical and energy sectors. ETSC specializes in producing highly accurate and stable optical measurement and automatic assembly products for on-chip/wafer scale optical components characterization, including, but not limited to, silicon photonic devices and systems, SiO₂ PLC, and LiNbO₃ components. ETSC Europe's mission is to build an intelligent world by bringing the most advanced optical testing and sensing technologies to the market.
www.etsc-tech.be



Huiwin Wang (Managing Director) received his master's degree of management engineering at Huazhong University of Science and Technology in Wuhan, China. With a unique vision for modern technology and a keen sense of the market, Huiwin chose to invest in the development of the optoelectronics industry and founded ETSC group in 1997. Under his leadership, after 20 years of development, ETSC Group has developed into an international enterprise with more than 100 employees and independent R&D capabilities.



EPIC is the European industry association that promotes the sustainable development of organisations working in the field of photonics. Our members encompass the entire value chain from LED lighting, PV solar energy, Silicon photonics, Optical components, Lasers, Sensors, Displays, Projectors, Optical fibres, and other photonics-related technologies. We foster a vibrant photonics ecosystem by maintaining a strong network and acting as a catalyst and facilitator for technological and commercial advancement. EPIC works closely with related industries, universities, and public authorities to build a more competitive photonics industrial sector, capable of both economic and technological growth in a highly competitive world-wide marketplace.
www.epic-assoc.com



Antonio Castelo (Photonics Technologies Program Manager) has a PhD from the Department of Applied Physics of Universidad de Santiago de Compostela in laser processing of glassy samples. In Madrid, he made a postdoctoral stay at the Instituto de Óptica of the Spanish National Research Council (CSIC), where he worked on the fabrication of nanostructures with dielectric and metallic materials via pulsed laser deposition. In 2010, Antonio entered the world of distribution as a Sales Engineer in the Photonics Department of the company Acal BFi, a job that he continued in the Spanish company Grupo Álava since 2012. In the latter, he was responsible for sales and marketing for Spain and Portugal of different laser systems, optical and optomechanical components, optical metrology equipment and other nano-characterization devices. In 2021, he became US Sales Manager for the company FYLA, a manufacturer of supercontinuum and ultrafast fiber lasers, for the development of the market in this country and the establishment of new relationships with the most relevant research centers in the world of optics and photonics. At EPIC, Antonio is supporting the technical needs of our growing membership as well as the EU-funded initiatives.



Elisenda Lara (Marketing Manager) studied Media and Communication at Universitat Autònoma de Barcelona and has been working in content marketing for more than ten years. She started her career in audio-visual media working as a cultural reporter, then jumped into the e-commerce sector, and before joining EPIC she has contributed to the dissemination of photonics through an association of the sector.



Helena Jelinkova (Events Manager) studied Business Administration and Management at Thomas Bata University in Zlin, Czech Republic. Her passion for traveling brought her into the hospitality and tourism industry. She worked for several international hotel brands in Prague at various positions both in the operations and sales departments. She dedicated most of her professional life to events. Projects she worked on range from corporate conferences and meetings to sport tournaments or weddings. In June 2019, she joined the EPIC team as Events Manager.



Ivan Nikitski (Photonics Technologies Program Manager) has a PhD in Photonics. He has a strong technical profile built by his experience in both academia and industry of new materials, optoelectronics and semiconducting. During the last 10 years, he grew professionally in the technical environment of photonic technologies and complemented it with important experience in microelectronic production. Ivan has developed projects covering a wide range of applications, such as detectors and wearables, image sensors and integrated photonics, high-speed and high-power electronics, thin-film materials and in-line metrology. He has developed various processes for wafer-scale material production and characterization, wafer-level device testing, innovative device concepts and demonstrators.



FEMTOprint SA, founded in 2013 in Muzzano (Switzerland), is a pioneer and market leader in high-precision, 3D microfabrication of custom-designed glass microdevices. Its activities focus on the Contract Development and Manufacturing of microsystems, from rapid prototyping to pilot and volume production at wafer-level, to serve leading international entities and fast-paving tech companies in biotechnology, life sciences, medical, watchmaking, automotive, aerospace, semiconductors, etc. In addition, with its new subsidiary located in Neuchâtel (Switzerland) the company aims to expand its business in photonics and miniaturized optics. The FEMTOPRINT® microfabrication platform enables indeed truly free-form surface/volume definition, welding, surface treatment, and ablative solutions in glass, thus creating a large variety of unique, three-dimensional microdevices. With a monolithic approach to avoid challenging assembly and alignment steps, it enables the integration of microoptical, micromechanical, and microfluidic functionalities. The company employs 35+ multi-disciplinary professionals and is certified ISO13485:2016 for medical device manufacturing. www.femtoprint.ch



Rolando Ferrini (Chief Regional Officer & Head of FEMTOprint Neuchâtel) joined FEMTOprint in 2022 as Chief Regional Officer and Head of FEMTOprint Neuchâtel, the new subsidiary devoted to photonic-related microdevices in glass. In 1999, he obtained his PhD degree in Physics at the Università degli Studi di Pavia, Italy, with a thesis on the optical properties of III-V semiconductor materials for electronics and optoelectronics. From 2000 to 2004, he worked as Research Associate at EPFL, Lausanne, Switzerland, where he studied the optical properties of semiconductor-based photonic crystal devices. From 2004 to 2011, as Senior Research Associate at EPFL, he was in charge of

the activities on organic devices for optics, photonics and lighting. From 2011 to 2022, he worked at CSEM as Group Leader MicroNano Optics and in 2021 as Head of the Focus Area Photonics. From 2020 to 2021, he founded the PHABULOuS pilot line for the manufacturing of freeform micro-optical components, acting both as project coordinator of the related H2020 project and as Managing Director.



First Sensor



First Sensor is one of the world's leading suppliers in the field of sensors and sensor systems. In the growth market of sensor systems, First Sensor develops and produces customer-specific solutions for the ever-increasing number of applications in the industrial, medical, mobility and aerospace and defence target markets. Our goal here is to identify, meet and solve the challenges of the future with our innovative sensor solutions early on. www.first-sensor.com



Iman Sabri Alirezai (Senior R&D Product Development Engineer) is a responsible engineer for research and development of chip design and process technology in photodetectors at TE connectivity (First Sensor), Germany. His expertise is in the field of device physics, semiconductor technology, quantum image sensors and detectors, LiDAR sensors and applications, and CMOS-MEMS devices. In 2017, he got his Ph.D. in electrical engineering in the field of microsystems and semiconductor technology from the Otto-von-Guericke University of Magdeburg, Germany. From 2018 to 2021, he was a postdoctoral researcher on Single-Photon Avalanche Diode (SPAD) and microelectromechanical (MEMS) Sensors at Université catholique de Louvain (UCLouvain), Belgium. He joined R&D photonics team at TE Connectivity 2021.



Fraunhofer Institute for Reliability and Micro-integration specializes in applied and industrial contract research on packaging technology and the integration of multifunctional photonics and electronics into systems. The institute covers all the competencies needed for advanced photonic packaging, such as, process development and qualification, and reliability and failure analysis with specific links to 3D wafer level packaging, silicon and glass interposer and 3D heterogeneous integration. Optical interconnection technologies, such as, photonic design, fiber optics, PIC integration, electrical-optical printed circuit boards and laser module assembly, system test are fields of excellence. The institute has a staff of more than 300 and earns 90% of the turnover through contract research. www.izm.fraunhofer.de



Tolga Tekin (Group Manager) has received the Ph.D. degree in electrical engineering and computer science from the Technical University of Berlin, in 2004. He was a Research Scientist with the Optical Signal Processing Department, Fraunhofer HHI, where he was engaged in advanced research on optical signal processing, 3R-regeneration, all-optical switching, clock recovery, and integrated optics. He was a Postdoctoral Researcher on components for O-CDMA and terabit routers with the University of California. He worked at Teles AG on phased-array antennas and their components for skyDSL. At the Fraunhofer Institute for Reliability and Microintegration (IZM), he then led projects on optical interconnects and silicon photonics packaging. At the Technical University of Berlin, he then engaged in microsystems, photonic integrated system-in-package, photonic interconnects, and 3-D heterogeneous integration research activities. He is Manager of Photonics and Plasmonics Systems Group at Fraunhofer IZM and coordinator of PhoxLab - European Photonics Innovation Hub for Optical Interconnects at Fraunhofer IZM. He coordinated European Flagship project on optical interconnects 'FP7-PhoxTroT', and is currently coordinating 'H2020-L3MATRIX' and 'H2020-MASSTART'.

The Fraunhofer Institute for Photonic Microsystems IPMS is one of the leading research institutions for the development and testing of electronic, mechanical and optical components and their integration into intelligent systems. The aim of our research is to expand the functionality of our customers' products through the use of our technologies, components and systems and to open up new applications through improved properties, ever smaller dimensions and additional functions. With an annual R&D volume of almost 50 million euros, more than 390 scientists, together with industry and the public sector, are developing market-ready solutions for the areas of Smart Industry, Medical & Health and Quality of Life. Fraunhofer IPMS develops devices and photonic integrated circuits based on silicon nitride waveguides. It offers the possibility to monolithically integrate waveguides with CMOS devices and to design them with low losses. Unique opportunities arise from the possibility to combine silicon nitride waveguides with liquid crystal waveguides. Fraunhofer IPMS has expertise in the design, fabrication on 200 mm wafers and characterization of waveguide devices and photonic integrated circuits, which are used e.g. as wavelength filters, switches, multiplexers etc. in optical communication networks, in spectroscopy and as transducer elements in optical sensing and biosensing. www.ipms.fraunhofer.de



Michael Scholles (Head of Fraunhofer Center MEOS “Microelectronic and Optical Systems for Biomedicine”) received the Diploma in electrical engineering and the Dr.-Ing degree, both from Gerhard-Mercator-University Duisburg (Germany), in 1990 and 1996, respectively. From 1990 to 1995, he has been with the Fraunhofer Institute of Microelectronic Circuits and Systems (Fraunhofer IMS) Duisburg, where he was working on biology-oriented signal processing systems and multi-processor systems. Since 1996, he has been with Fraunhofer IMS Dresden, which became Fraunhofer IPMS (Institute for Photonic Microsystems) in 2003. He had numerous management positions at Fraunhofer

IPMS including head of “Business Development & Strategy” from January 2011 until June 2018. Since January 2018, he is the head of the Fraunhofer Center “Microelectronic and Optical Systems for Biomedicine” which comprises the interdisciplinary work of three different Fraunhofer institutes including IPMS.

Ghent University hosts the NB-photonics multidisciplinary research center. This research center focuses on Key Enabling Technologies (KETs) within photonics, nanotechnology, and biotechnology to solve societal challenges such as qualitative and affordable healthcare, clean and renewable energy, and efficient ICT. The intricate nature of the challenges at hand necessitates a multidisciplinary approach. www.nb-photonics.ugent.be



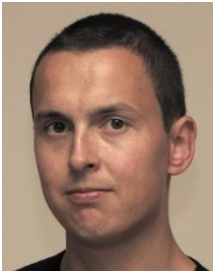
Dries Van Thourhout (Professor at Photonics Research Group) received the degree in physical engineering and the Ph.D. degree from Ghent University, Ghent, Belgium in 1995 and 2000 respectively. From Oct. 2000 to Sep. 2002 he was with Lucent Technologies, Bell Laboratories, New Jersey, USA, working on the design, processing and characterization of InP/InGaAsP monolithically integrated devices. In Oct. 2002, he joined the Department of Information Technology (INTEC), Ghent University, Belgium. He is also associated with imec. His research focuses on the design, fabrication and characterization of integrated photonic devices. Main topics involve Silicon

nanophotonic devices and the integration of novel materials on these waveguides to expand their functionality. He is working on applications for telecom, datacom, optical interconnect and quantum optics. He has submitted 14 patents, has authored and coauthored over 270 journal papers (see below) and has presented invited papers at all major conferences in the domain. He is member of the IEEE Photonics Society, SPIE and OSA (fellow). He has coordinated several European Projects (FP6 PICMOS, FP7 WADIMOS, FP7

SMARTFIBER), contributed in many more and received both an ERC Starting Grant (ULPPIC) and ERC Advanced Grant (NARIOS).



Eva Ryckeboer (Business Developer Photonics) works for the NB-photonics multidisciplinary research center at Ghent University. She is responsible for the valorization of research results in the field of photonics technology at Ghent University. Prior to that, she worked as a Silicon Photonics designer for imec and as project leader for the FP7 EU ACTPHAST project. She obtained a PhD in Silicon Photonics from Ghent University in 2014.



Wim Bogaerts (Professor) did a PhD in the group of prof. Roel Baets, where he started up the activities in silicon photonics on imec's 200mm CMOS pilot line, resulting in his PhD in 2004. The work on silicon fabrication technology, and the many collaborations with other research groups for joint fabrication planted the seed for the multi-project-wafer service ePIXfab. In June 2014, Wim co-founded Luceda Photonics, a spin-off company of Ghent University, IMEC and the University of Brussels (VUB). Luceda Photonics now further develops IPKISS and other software solutions for silicon photonics design. In October 2016, Wim left the thriving company and returned to his academic interests, supported by a Consolidator Grant of the European Research Council. His research focus now moves towards the operation of large-scale silicon photonic, where the combination of photonics, electronics and software leads to programmable and self-configuring photonic circuits.

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Hamamatsu Photonics, driven by Japanese excellence and market-leading optoelectronic technology, helps our customers visualize, measure, and analyze crucial information. Our mission is to establish photonics as a fundamental source of innovation for all customers. On the forefront of the development of new and existing applications, our advanced and highly sophisticated product range includes sources, detectors and imaging products designed to cover the entire optical spectrum. Present since 1953 across a vast array of industries, such as scientific research, medical, and industrial processes, we leverage added-value services and custom-made photonics solutions to meet our customer's ambitions without compromise. With headquarters in Hamamatsu, Japan, where our manufacturing and research facilities are located, we enjoy a global presence with business offices and associated companies throughout Asia, Europe and North America, and over 5,000 staff worldwide. www.hamamatsu.com



David Castrillo (Business Development Manager) studied Telecom and Electronics at the Polytechnic University of Catalonia and doing a project on Integrated Photonics in 1992. In 1993, he joined Hamamatsu Photonics as a Sales Engineer. Today he is managing the Spain-Portugal office and collaborating with the Venture Capital group of Hamamatsu Photonics in Europe.

Huawei, founded in 1987, is a leading global provider of information and communications technology (ICT) infrastructure and smart devices. We have nearly 195,000 employees, and we operate in more than 170 countries and regions, serving more than three billion people around the world. Huawei's end-to-end portfolio of products, solutions and services are both competitive and secure. At Huawei, innovation focuses on customer needs. We invest heavily in basic research, concentrating on technological breakthroughs that drive the world forward. www.huawei.com



Benedetto Troia (Product Lead) is responsible for the product development of short-reach WDM receivers and Silicon Photonics 3D sensing applications at Huawei Technologies Belgium R&D Center. He obtained his M.Eng. in Electronic Engineering from the Polytechnic of Bari (Italy) and his PhD in integrated Photonics from the Interpolytechnic Doctoral School (Italy), a joint PhD program of high qualification whereby Polytechnic of Torino (coordinator of the project), Polytechnic of Bari and Polytechnic of Milano. In the framework of his PhD and Postdoc, he carried out significant research activities at the Optoelectronics Research Centre, University of Southampton (UK). He worked at IMEC Belgium (2017-2018) and joined Huawei in 2018 where he is now in charge of product development in the field of optical transceivers and coherent technology for 3D imaging and sensing.



Daniela Diamare (Integration Engineer) received her PhD from University College London, UK, on applications of Si nanoclusters in silicon photonics in 2014. Then she worked within the team of process integration in Seagate contributing to the development of a novel magnetic media technology using plasmonics to increase data storage. After working as process engineer in Oclaro (Lumentum), in 2018, she joined Huawei where she now works as project lead on the research and development of novel integrated photonic devices targeted primarily for high-speed optical interconnects applications.



Giovanni Cotella (Project Manager) is project manager at Huawei Ipswich Research Center (IRC), the European Huawei III-V foundry. As part of the cooperation team, he is in charge of chartering ambitious and high impact R&D projects with European partners mainly for telecom, sensing and display applications. In 2018, he joined Huawei as senior display engineer and has relevant experience in display technology and mass transfer printing methods for display applications. He holds a PhD in Physics (on thin film devices) from University College London, UK.



Tom Janssens (Team Leader Silicon Processing) continued research in the interuniversity microelectronics center (imec) in different groups (material analysis, clean processing, solar cells) between 2003-2012 after receiving PhD in science in 2003. He joined ON Semiconductor (2012-2015) as process integration engineer, developing power FETs. In 2015, Tom joined Huawei Technologies R&D Belgium, as senior process integration engineer, following up development programs in imec. Currently, he is team leader silicon processing and responsible to evaluate new opportunities in silicon photonics outside the traditional telecom area.



Yasar Kutuvantavida (Senior Engineer) received an M.Sc. in Physics from the Indian Institute of Technology (IIT) Madras and a PhD in Photonics from Massey University New Zealand. Yasar has been working on electro-optic polymers for communication and sensing applications as part of Victoria University of Wellington, Callaghan Innovation New Zealand, and University of Wollongong Australia. Yasar joined Karlsruhe Institute of Technology (KIT), Germany in 2014, where he was actively involved in the development of high speed and power-efficient silicon-organic and plasmatic-organic hybrid electro-optic modulators. He joined Huawei in 2019; Huawei Weilheim Manufacturing Technology Center (WMTC), active in precision manufacturing (R&D) for optics and photonics.



Zheng Han (Senior Technology Cooperation Manager) is a Senior Technology Cooperation Manager, working at the Institute of Strategic Research of Huawei. Based in Huawei Technologies France, he is actually in charge of strategic cooperation and investment management in the fields of nanotechnology and semiconductors in Europe. He obtained his Ph.D. in physics (photonics) from Paris-Sud University (today's Paris-Saclay University). He got his French national associate-professor qualification certificate in section 63 (Electronic, electric and photonic systems engineering) and section 28 (Condensed matters and materials), delivered by the French Higher Education and Research Ministry in 2013. His interest is focused on Photonic Integrated Circuits (PIC). He has more than 16 years of experience in semiconductor processing in cleanroom.



ICON Photonics has developed a wafer-level integration platform combining a Silicon Optical bench and a unique on wafer polymer microoptics technology. This platform is ideal to create custom and reliable optical micro-benches integrating fiber coupling and attaching solutions as well as high-speed electrical interconnects, enabling the next generation connectivity addressing the optical transceiver market and the Quantum photonics markets. www.icon-photonics.com



Carlos Viana (CEO) is the Co-founder and Chief Executive Officer of a deep tech startup company, ICON Photonics SAS, developing advanced chip optical I/O interconnects for the next generation connectivity. He holds a PhD in Photonics from Université Paris-Est, France and he has more than 10 years of experience in photonics technologies, Administration & Business development.



IMB-CNM, the Microelectronics Institute of Barcelona belongs to the Spanish National Research Council: CSIC. The institute has a cleanroom facility: a 1500m² class 100/10.000 devoted to micro- and nanotechnologies with a high level of process flexibility. Within the area of photonics our centre has established a useful integrated technology based on silicon and silicon based-dielectrics to obtain: optical components, electro-optical devices and hybrid elements. A fabrication process on Silicon Nitride technology has been developed in collaboration between IMB-CNM and VLC Photonics, providing a stable and scalable photonics manufacturing platform with a mature process design kit (PDK) and component libraries in the NIR range of the spectrum and currently IMB-CNM is targeting the development of a PDK in the visible range of the spectrum. www.imb-cnm.csic.es



Joaquin Faneca (Researcher) finished his B.Sc. in Physics at Universidad de Sevilla and his Master degree in new Photonic Technologies at Universidad Complutense de Madrid. Afterwards, he was awarded with the research fellowship from EPSRC (UK) to pursue the Ph.D. research project in photonic integrated circuits between the University of Southampton, the University of Exeter and co-funded by Lumentum Operations LLC. He has been involved in the design, simulation, fabrication, and characterization of actively tunable devices based on Si and Silicon Nitride platform combined with reconfigurable materials such as phase change materials, liquid crystals and graphene which has been

used as key components for photonic systems. He joined IMB one year ago to develop a photonic integrated circuit process design kit in the visible range of the spectrum a keep developing the current platform in the NIR for different applications.

Imec performs world-leading research in nanoelectronics. We leverage our scientific knowledge with the innovative power of our global partnerships in ICT, healthcare and energy. We deliver industry-relevant technology solutions. In a unique high-tech environment, our international top-talent is committed to providing the building blocks for a better life in a sustainable environment. Imec has diverse photonic tracks which carry out world-leading R&D and opportunity for access. www.imec.be



Amin Abbasi (Business Manager) received his PhD degrees in ultra-high-speed directly modulated DFB lasers from Ghent University/imec in 2016. He continued his research at imec/UGent on 100 Gb/s single-channel EAM modulators until 2017. He joined AntwerpSpace/OHB as Photonic Team Leader on microwave photonics applications. From 2020, he is in the role of Business Development Manager at imec, covering imec's SiN/Si 200- and 300-mm photonic platforms for multiple applications such as quantum computing, lidar, bio-sensing, AR/VR. He has (co-)authored more than 50 peer-reviewed publications.



Nora Maene (Senior Business Development Manager) is a Senior Business Development Manager at imec towards fabless semicon and systems accounts, promoting cooperation projects involving imec core R&D technologies such as Si photonics, wafer bonding and packaging, advanced logic, memory, advanced RF, design technology co-optimization, etc. She is with imec for 8 years now. Prior to that she was a Marketing Director at Alcatel-Lucent (now Nokia) and Global Marketing Manager with TE Connectivity. Nora has a master in electrical engineering with KUL Leuven, Belgium ('87) and a postgraduate in marketing with INSEAD in France (2001).



Peter Ossieur (Senior Researcher and Program Manager) received an M.Sc. Engineering degree in applied electronics and a Ph.D. in electrical engineering from Ghent University, in 2000 and 2005, respectively. From 2005 to 2008, he was a Postdoctoral Fellow of the Fund of Scientific Research, Ghent University. During that time, his research was focused on 10Gbit/s burst-mode receivers and optoelectronics for automotive applications. In 2008, he became a part-time Professor of High-Frequency Electronics at the Faculty of Engineering, Ghent University. In 2009, he joined the Photonic Systems Group, Tyndall National Institute and the Department of Physics, University College Cork, Cork, Ireland, where he became Senior Staff Researcher in April 2013. In this position he established an IC design group focusing on opto-electronic applications. In October 2017, he joined IDLab, an imec research group at Ghent University, as Senior Researcher and is currently Program Manager High-Speed Transceivers. He leads research activity focused on the development of high-speed analog and mixed-signal integrated circuits for photonic applications. He has (co-) authored 125 peer-reviewed papers, and holds several patents in the aforementioned research areas.



Philippe Absil (Vice President R&D, Department Head) is the Vice President R&D, Department Head at imec since 2019 and has been responsible for the silicon photonics technology platform development since 2010. Before that, he spent seven years managing the advanced CMOS scaling program at imec. In the early 2000s, he developed the passive photonics platform technology for Little Optics Inc., Maryland, USA. He earned his Ph.D. degree in 2000 from the department of electrical engineering at the University of Maryland at College Park. His doctoral work contributed to the early demonstrations of semiconductor micro-ring resonators.



Philippe Soussan (Program Director) is currently Program Director within the sense & actuate unit of IMEC. His field of expertise covers the interaction between processes and material properties, as well as wafer scale technology integration in the field of multi-physics devices which comprises: 3D interconnects, micro-fluidics and lately integrated photonics. From 2007 till 2011, he has led the group “Packaging, Microsystems and Hybrid Technology”. The group dealt with complex process integration using 3D interconnects, advanced packaging and micro fabrication of scaling and non-scaling driven components. In 2011, he became Program Manager for the smart system division

of IMEC, which mission is to enable novel product in the field of More than Moore, such as sensors, microsystems in the field of RF and opto-electronics. Since 2019, he is also Program Director for the optical beam forming program of IMEC, which aims at developing integrated photonics manufacturing technologies for miniature optical sensors.



Ruud Oldenbeuving (Principal Scientist) is an all-round expert in laser physics, specialized in hybrid integration of passive and active photonic integrated circuits. He is consulted by industry leaders, institutes, and universities for his knowledge on hybrid integrated lasers, because he is a pioneer in the field of tunable ultra-narrow linewidth hybrid integrated lasers. Ruud has been active in the field of integrated photonics since 2008 and in the field of laser physics since 2005.



Imec.xpand is one of the largest, dedicated, early stage semiconductor technology investors in the world. Our outspoken international mindset towards building global companies and our unique ability to assess technology risk in the earliest stages of the technology roadmap allows for a game-changing approach to hardware driven nanotechnology innovation. We invest in ambitious start-ups that are deeply rooted in technology and where the knowledge, expertise, and infrastructure of imec, the world leading R&D center for semiconductor- and nanotechnology, plays a differentiating role in their success. www.imecxpand.com



Cyril Vancura (Director) is Partner at imec.xpand, an independently managed value-add venture capital fund that focuses on hardware-based nanotechnology innovations where imec technology, expertise, network and infrastructure will play a differentiating role. Based in Leuven, Belgium, Cyril is focusing predominantly on deeptech investment opportunities in Europe and the US. Before joining imec.xpand, Cyril was Investment Principal at Robert Bosch Venture Capital GmbH (RBVC). At RBVC he was based in Germany, as well as, in the affiliate office in Silicon Valley. Cyril holds a Ph.D. and a diploma (Master Degree) in physics from the Swiss Federal Institute of Technology (ETH) in Zurich.



Indigo Diabetes (Indigo) is a pioneer of continuous multi-metabolite monitoring and was founded by Danaë Delbeke and her team in 2016. Today, Indigo is developing a next generation solution for continuous glucose monitoring (CGM) – called a continuous multi-metabolite monitoring system (CMM). It is designed to provide people living with diabetes access to information on their glucose and other metabolite levels at any given time, without requiring them to wear an external device on their body. Indigo exploits ground-breaking nanophotonics technology, which was responsible for revolutionizing the Internet, to transform diabetes management. Indigo is based in Ghent, Belgium. www.indigomed.com



Danaë Delbeke (CEO) is the inventor, Founder and CEO of Indigo. She drives Indigo's strategic vision, culture and passion to transform science into products that will improve the life of millions of people. She has a successful track-record in business management and entrepreneurship having successfully founded or co-founded 7 high-tech photonics companies over the past 12 years. In 2002, she received her Ph.D. degree in Applied Sciences from Ghent University and holds a Bachelor of Science in Economics as well as a Bachelor and Masters of Applied Sciences/Engineering in Photonics.



Intel is best known for our processors, but we do so much more. We are makers, catalysts and inventors. We innovate at the boundaries of technology to make amazing experiences possible for business, society, and every person on Earth. With more than 100,000 employees in 63 countries and customers in over 120, Intel's products and services create the foundation for limitless invention. Our innovations are bringing sight, touch, depth-perception and the ability to communicate to devices, objects and spaces to make them smart and connected. We harness the capability of the cloud and the Internet of Things to disrupt industries while solving global challenges. We lead on important matters of policy, diversity, inclusion, education and sustainability. Intel has transformed to a company which now also powers the majority of the world's data centers, connecting hundreds of millions of mobile and Internet of Things devices, and helping to secure and protect enterprise and government IT systems. Our manufacturing advantage, fueled by our pursuit of Moore's Law, lets us continuously push the limits of performance and create experiences which can be made possible. www.intel.com



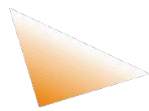
Conor O'Keeffe (Principal Engineer) is a Principal Engineer in Intel's Programmable Solutions Group CTO team. Conor plays a key role in a number of DARPA programs such as CHIPS, and Space-BACN. Prior to joining Intel Programmable Solutions Group in September 2017, he has held a number of roles including, Intel SoC Architect, founding CTO of wireless company "Socowave", and cellular chipset architect at Freescale/Motorola and RFIC designer. His expertise spans photonics, RF, wireless, test, SoC, wireline technologies, RAN, DSP and mixed signal Analog/RFIC design. Conor is an inventor on 37 granted patent families. Conor is a graduate of Munster Technological University and University of South Wales. Conor is based in Cork, Ireland.

iPronics, Programmable Photonics is a spinoff company from the Universitat Politècnica de València, Spain. iPronics develops the innovative concept of Field Programmable Photonic Gate Arrays (FPPGAs), which are based on a common optical hardware configurable through software to perform multiple functions. iPronics contributes to the development of future information processing systems where electronics and photonics work cooperatively by synergistically exploiting the best capabilities of each technology. It brings the added value of optical reconfigurability to products with broad fields of application including 5 and 6G telecommunications, data center interconnection, artificial intelligence, signal processing, sensing and quantum information. www.ipronics.com



Ana González (Director of Strategic Partnerships) is Director of Strategic Partnerships at iPRONICS. Her role is to investigate new applications and identify potential partners for the implementation of Field Programmable Photonic Gate Arrays (FPPGAs) including relationships with the supply chain and supporting customer operations. She has a solid network at the Photonic Integrated Circuit (PIC) industry with a large experience reaching out commercial partners and new adopters of PIC technologies. Her expertise lies in the development of optical systems and the investigation of applications such as Sensing and Datacom. She received her bachelor's degree in Chemistry from the University

Autonomous of Barcelona (UAB) and her PhD degree from the Catalan Institute of Nanoscience and Nanotechnology (ICN2).



LIGHTWAVE LOGIC®

Lightwave Logic develops innovative optical materials and devices for the Algorithmic Age. We seek to lower the friction for moving the ever-growing amounts of data that characterize our times. Our target customer base is the optical datacom and telecom hardware suppliers that interconnect the vast pools of data residing with cloud providers, communications providers, enterprises and governments. Our solutions start with our own engineered materials which are used in devices and packages that we design to optimize performance. The resulting components transmit data at unmatched speeds. They require less electric power than their conventional counterparts. Their fabrication is simpler and requires less expensive equipment. We currently focus on several markets, including electro-optic modulators to address 100 Gbps and 400 Gbps fiber optic communications. We expect to introduce our high-performance photonic devices into the commercial marketplace in the near future. Lightwave Logic, Inc. is a US company with in-house materials synthesis, device and package design, wafer fab and test capabilities in our Englewood, Colorado headquarters. www.lightwavelogic.com



Michael Lebby (Board Director) joined Lightwave Logic as a member of the Board of Directors in 2015. In May 2018, he assumed the role of CEO, Lightwave Logic Inc (LWLG:OTCQB). Michael's career started with the British Government in 1977, in telecommunications and he did research at their research labs (RSRE Malvern) in the early 1980s. He worked at AT&T's research labs: Bell Labs (1985-1989) in photonics, and subsequently drove the development (and co-authored the first patent) of the oxide VCSEL diode laser at Motorola in the 1990s (which is now used in laser mice, 3D sensing/FaceID in mobile phones, optical interconnects; where volumes of the laser are

over 1B units today). From 2005-2010, he led the USA trade association in optoelectronics (OIDA) and represented the optoelectronics and photonics industry on Capitol Hill. Michael has run technical start-ups and commercialized optoelectronic and photonics technology into volume manufacturing. He is currently a technical expert to the European Commission. Michael holds over 450 issued international patents in photonics and electronics, that have been derived from over 200 issued USPTO utility patents, mostly in the

field of optoelectronics, photonics and semiconductors. Michael is passionate about photonics, and has focused his efforts over the last 30 years to drive new photonics manufacturing programs in USA and Europe as well as industry-based photonics technology roadmaps.



LIGENTEC is a Swiss based manufacturing partner, offering low loss SiN Photonic Integrated Circuits (PICs) for industries such as quantum technologies, LiDAR, communications, space and sensors. Due to its high confinement, the thick nitride waveguides and resonators have low bending losses and excel even in high power applications from the visible to the mid-IR. The main application areas for this advanced silicon photonics low loss technology include coherent telecommunication, LiDAR, metrology, supercontinuum generation, spectroscopy, sensing and microwave photonics. Ligentec's All Nitride Core Technology platform is fully CMOS compatible, thus allowing us to offer ramping up to high volumes benefiting from the scale of the semiconductor industry. www.ligentec.com



Camiel Op de Beeck (Customer Project Engineer) offers technical support to businesses who want to make use of LIGENTEC's low-loss integrated photonics platform. He is also managing the development efforts towards the integration of lithium niobate on LIGENTEC's platform. Through his doctoral degree in the field of integrated photonics at Ghent University, he acquired a solid background in integrated photonics component design, circuit layout and fabrication.



LioniX International is a leading global provider of customized microsystem solutions. We have driven technological and commercial development in photonic integrated circuits since 2001. We work with OEMs and system integrators, using a vertically integrated approach to support all stages of the production process, from design to delivery of a finished module. And with world-class fabrication facilities, we scale production volumes as customer requirements grow. Our ability to deliver innovative modular solutions based Photonic Integrated Circuits (PICs), lies in our strong IP portfolio. This includes our proprietary waveguide technology—TriPlex™—as well as the fundamentals of our competences in micro-fluidics, opto-fluidics and MEMS. www.lionix-international.com



Douwe Geuzebroek (Vice President Marketing & Sales) has over 15 years of experience in integrated photonics and its applications, ranging from R&D to product development stages. He has a strong interest in matching the technical aspect of a technology to the needs of the market. Douwe has a background in Electrical Engineering in which he finished his PhD at University of Twente at the Integrated Optical MicroSystem (IOMS) group on a topic of applying integrated optical microring resonators in telecommunication networks. In 2005, he joined LioniX as a Design Engineer and Project Leader, focusing on microring resonators and other integrated optical telecommunication devices, and was actively involved in the start-up of XiO Photonics in 2008. As VP Marketing and Sales at XiO Photonics, he supported the development of the waveguide technology for visible light applications and the introduction of this technology in several products. He participated in several research projects both national and European. Currently as VP Marketing & Sales at LioniX International he is involved in the acquisition of new commercial and research projects for photonic integrated modules in Life Science, metrology and telecommunication applications.

Luceda Photonics enable photonic IC designers to enjoy the same power as electronic IC designers. We automate and integrate the complete photonic design flow. Our Python-based platform enables design teams to easily share and reuse their photonic design IP using a standard language. We leverage more than 50 years of photonic experience to help our customers create manufacturable designs. Our design products bundle our expertise to enable our customers to quickly achieve their first tape-out and get their design right the first time. www.lucedaphotonics.com



Pieter Dumon (CTO) is CTO of Luceda Photonics. In 2002, Pieter obtained his Master’s degree in Electronics Engineering, and PhD in electronics (photonics) in 2007, both at Ghent University. He coordinated ePIXfab, the first MPW service for photonics, which he expanded to kickstart design and packaging services for photonic ICs. In 2014, Pieter co-founded Luceda Photonics, where he brings design automation software and photonic IC technology together.

Meta

Meta builds technologies that help people connect, find communities, and grow businesses. When Facebook launched in 2004, it changed the way people connect. Apps like Messenger, Instagram and WhatsApp further empowered billions around the world. Now, Meta is moving beyond 2D screens toward immersive experiences like augmented and virtual reality to help build the next evolution in social technology. www.about.facebook.com



Yiwan Wong (Director of Technology Partnerships) is the Director of Technology Partnerships at Meta Platform’s Realty Labs, responsible for formulation of engagement strategy and establishment of technical partnerships with external parties for Realty Labs’ product development activities. Prior to joining Meta, Yiwan was the CEO of Compound Photonics, a 100+ people startup that successfully developed and demonstrated the world smallest LCoS microdisplay technologies. Prior to that, Yiwan held executive and management positions at leading semiconductor companies including Samsung Electronics, Qualcomm, and Texas Instruments. Yiwan received his Ph.D. degree in Computer Science from Yale University, a Bachelor of Science degree in Electrical Engineering from California Institute of Technology, and an MBA degree from University of Texas, Austin.



Merck, a leading science and technology company, operates across healthcare, life science and electronics. Around 58,000 employees work to make a positive difference to millions of people's lives every day by creating more joyful and sustainable ways to live. From advancing gene editing technologies and discovering unique ways to treat the most challenging diseases to enabling the intelligence of devices – the company is everywhere. In 2020, Merck generated sales of € 17.5 billion in 66 countries. Innovation in Electronics is driven at the atomic level. We develop science that sits inside technologies and changes the way we access, store, process, and display information. Our contributions to the electronic industry help enable high-tech materials and solutions that are vital to our everyday lives, like smartphones, the Internet of Things and autonomous driving. Working in partnership with leading global players, we develop materials that help enhance each new generation of products, making them smaller, faster, smarter and better connected. Electronics starts with us. We are the company behind the companies advancing digital living.
www.merckgroup.com



Mark Goebel (Technology Fellow) studied Chemistry in Kaiserslautern with focus on non-linear optical and electrooptic properties of organic materials. Joined Merck in 2006 to work in liquid crystal related display research. He spent three years as head of liquid crystal research at Merck's research center in Chilworth (UK). In his role as Technology Fellow, he is responsible to establish a clear view of coming macro trends in the electronics industry. To enable this, he works together with the CTO team as well as all Electronics businesses on establishing a trend radar, as well as technology roadmaps and strategies. Also, building up a strong external network to exchange on future trends is one of his key responsibilities.



MICLEDI Microdisplays, a technology startup from Belgium, develops small, ultra-bright display microchips for Augmented Reality (AR) glasses. It is a latest spin-out of imec based on the manufacturing technology and IP developed in the research centre. MICLEDI's business model is a fabless development and sales of AR 'light engines'. This will basically be a single chip that will include the LED arrays, the advanced CMOS backplane, the driver electronics and optics - all tested and calibrated for AR headset use. This highly integrated solution enables MICLEDI's customers to enjoy an extremely small display footprint, a low power consumption, and an excellent image quality that can be calibrated and tuned for specific headset requirements.
www.micledi.com



Soeren Steudel (Co-founder and CTO) is Co-Founder and CTO at MICLEDI microdisplays, developing the next generation μ LED displays for AR waveguide optics. Prior to founding MICLEDI in 2019, he worked as principal member of technical staff at imec on process integration for AMOLED displays, X-ray imager, fingerprint sensors, 3D stacked logic and DRAM.

Nanoscribe is a pioneer and market leader in high-precision additive manufacturing. The supplier of 3D printers and maskless lithography systems for microfabrication also develops tailor-made print materials as well as smart process solutions inspiring and enabling customers to materialize ground-breaking ideas. The wide range of applications in research, prototyping and industrial production processes especially addresses EPIC's needs for photonics technologies such as PIC, microoptics, diffractive optics as well as waver-level optics. The vibrant, award-winning company is supported by ZEISS and headquartered in Karlsruhe. Today, the medium-sized company with over 70 highly qualified employees provides complete solutions from its locations in Germany, China and the USA. More than 25% of our 2-digit million annual revenues are invested in the future of microfabrication. Thus, we deliver smart solutions for more than 1,500 active system operators that enable them to materialize ground-breaking ideas. www.nanoscribe.de



Jörg Smolenski (Business Development Manager) has an international background of more than 20 years in industrial laser technology. He started as an international sales manager at Lumibird in France (formerly Quantel), joined their US subsidiary for transfer of product know how and then developed the sales at High Q Laser in Austria. As an Alumni of the RWTH Aachen and the Fraunhofer ILT, he holds a degree in Mechanical Engineering. He has experience in key account management, business development, laser technology, international sales and in industrial laser applications such as welding, marking and micromachining. After having been for 12 years with TRUMPF, he joined

Nanoscribe in May 2019 as Business Development Manager.



Nubis communications is a startup based in the New York City Metropolitan Area. The company was founded in 2020 and is funded by a number of domestic and international venture capital firms as well as strategic investors. Nubis Communications develops disrupting high-speed, high-density and low-power optical transceivers for machine learning, AI and datacenter communications. www.nubis-inc.com



Marco Lamponi (CEO) is Co-Founder and Director of photonic integration at Nubis communications. He holds a PhD from Université Paris Sud for his work on hybrid III-V on silicon lasers for telecommunication applications. Since 2008, he has been working on the development of photonic integrated circuits and semiconductor lasers. He first joined Alcatel-Lucent Bell Labs (III-V lab), France, where he was in charge of both the design and the fabrication of III-V on silicon hybrid devices. Then he worked for Thales Research and Technology where he coordinated the fabrication of high power semiconductor lasers and integrated photonic transceivers at sub-terahertz wave range. From 2014 to 2020 he

worked for Huawei HiSilicon in Gent, Belgium, where he led the silicon photonics design team developing PIC transceivers products for coherent and datacenter applications.



Oxford Ionics is a start-up building Quantum Computers to revolutionise industries from drug discovery to material design. Quantum Computing offers a radically new way of building computers that harnesses the power of quantum physics to be exponentially more powerful than conventional supercomputers. We are using unique trapped-ion technology to build the first Quantum Computers that can realize this potential, which includes integrated photonics technology. Located in Begbroke Science Park with great transport links to Oxford's beautiful city centre and University as well as London, we are an agile, ambitious company who champion creative thinking in a fast-paced environment at the cutting edge of technology.
www.oxionics.com

Chris Lewins (Integrated Photonics Designer) received his MEng(hons) in Electronic and Electrical Engineering in 2011 and Doctor of Philosophy (Ph.D.) - Electronic and electrical engineering in 2015 at the University of Bath. Chris started his career as Research Officer at the University of Bath (2015-2020), then he served as Principal Engineer at EFFECT Photonics (2016-2019), Lead Development Engineer at AFE (2020-2022) before joining Oxford Ionics in February 2022.



PHIX Photonics Assembly started operations in July 2018. PHIX is offering a cost-effective manufacturing service for Photonic Integrated Circuit (PIC)-based modules in large volumes. PHIX is located at the High-Tech Factory in Enschede, the Netherlands. PHIX offers assembly services for all three major PIC technology platforms (InP, Si and TriPleX) and is specialized in hybrid integration of multiple PICs in one module both with optical fiber interfaces as well as free space optical interfaces through micro optical components.
www.phix.com



Joost van Kerkhof (COO) started PHIX in 2018 together with Albert Hasper (CEO). He has more than 25 years of experience in the micro-nano technology industry. Before starting PHIX, Joost was the CEO of XiO Photonics since 2013 and the COO of LioniX International since the merger of XiO Photonics, LioniX and SatraX into LioniX International in 2016. Before joining XiO Photonics, Joost worked with Sensata Technologies as Director Business Integration. In this role, he built a significant experience in business case analysis and development. Before his role in business management, he has held positions within Texas Instruments (which became Sensata Technologies in 2006) as Director R&D and Director Operations. In these positions, he has brought several products in high volume production. Joost holds a master's and Ph.D. degree in electrical engineering specialized in micro-nano technology and (bio)sensors.

PhotonDelta is an ecosystem of organisations that researches, designs, develops, and manufactures solutions with integrated photonics technology. Connecting pioneers in the field with investors, and viable markets, PhotonDelta helps to take the industry forward with funding, investments and R&D roadmaps. PhotonDelta is located in the Netherlands but connects and collaborates throughout Europe. www.photondelta.com



Carol de Vries (Chief Technology Officer) is Chief Technology Officer at PhotonDelta, focusing on new growth opportunities in Integrated Photonics. He received a Master's Degree in Physics at Eindhoven University of Technology. Carol has 40 years of experience in the electronics industry working in R&D, new business management and executive positions. He is particularly experienced in semiconductors, sensors and systems. Carol worked at Philips, NXP and Sensata, in roles such as Vice President R&D CTO and General Manager, gaining experience in automotive, datacom and healthcare industries.



RiverD International develops and brings to market dedicated solutions for unmet diagnostic needs, based on in vivo and ex vivo Raman spectroscopic tissue analysis. RiverD's Raman microspectroscopy and fiber-optics technology platforms excel in sensitivity and reproducibility and are readily adaptable to meet the requirements of a particular application. The gen2-SCA family of in vivo skin analyzers provides unique insight into the molecular composition of the skin with high spatial resolution, and enables the study of skin penetration properties of topically applied materials. This technology is in use worldwide by personal care industry, pharmaceutical industry and university medical centers. RiverD's fiber-optic Raman technology aims for applications in guided (robotic/laparoscopic) surgery and guided biopsy. www.riverd.com



Gerwin Puppels (Managing Director) is Associate Professor at Erasmus-university Medical Center, Rotterdam, The Netherlands. He is also the Founder, Chief Technology Officer and Managing Director of RiverD International B.V. Rotterdam.

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Kyoungho Ha (Electronics Principal Engineer) was born in Korea in 1968. He received the M.S. and Ph.D degrees in physics from Korea Advanced Institute of Science and Technology (KAIST) in 1994 and 1999. He joined Samsung Electronics in 1999 where he led an effort to develop silicon-based photonic devices for use in next-generation optical interconnect. He is currently a principal researcher and project leader of the solid-state LiDAR development. His research interests include many area of optical technology such as III/V-on-Si Photonics, optical interconnect for datacenter/memory, GaN LD/LED and VCSEL.



Scantinel Photonics is a high-tech start-up developing next generation LiDAR technologies that show autonomous vehicles their way. At Scantinel, we believe that future long range, reliable LiDAR sensors will be based on coherent (FMCW) ranging and solid state scanning. Our Optical Enhanced Array (OPATM) scanning technology combines best in class silicon photonics with advanced optics, to deliver a high resolution 5D point cloud (xyz, velocity, reflectivity) with a range over 300m. The whole technology stack of Scantinel, including the integrated narrow line-width swept laser source, is fully based on CMOS compatible process technology, to ensure scalability for high volume manufacturing. www.scantinel.com



Frank Gindele (Head of Optics and Mechanics) received his PhD in 1999, after studying physics at the University of Karlsruhe and Dortmund. During that time his research activities have been about optical spectroscopy, semiconductor nanostructures like quantum dots, specialized on the time-resolved laser spectroscopy in the femtosecond regime. From 1999 to 2006, he worked at the Institute for Microtechnology (IMM) in Mainz, responsible for the Optical Sensor Group. His activities were focused on miniaturised optical systems for on-line monitoring, optical spectroscopy, optical position controlling and infrared detection. From 2006 to 2010, he was Head of R&D at

PerkinElmer Elcos leading the product development of LED modules, especially for white light LEDs. From 2010 to 2021, Frank Gindele worked for Schott AG as R&D Manager, starting a new business line at Schott for hermetic LED modules. End of 2021, he joined Scantinel Photonics, as Head of Optics & Mechanics developing new LiDAR systems for automotive and industrial markets.



SCREEN Semiconductor Solutions is a global semiconductor equipment supplier, providing technology and equipment solutions for wet etch/clean technology, photoresist processing, wafer annealing, wafer inspection, and film thickness measurement. Founded and headquartered in Kyoto, SCREEN is present in Europe, the USA, and APAC regions. Top 10 Semiconductor Manufacturing Solution Providers for the year 2022 according to Semiconductor Review Europe, SCREEN steadily holds the largest market share in the wet etch/clean equipment segment, serving all major semiconductor manufacturers (Logic, Foundry, Memory, Analog, Power, CMOS Sensor) and a variety of electronics manufacturers (MEMS, SAW/BAW filter, LED). Besides an extensive line-up of equipment for 300 mm standard Si wafers processing, the Frontier series provides advanced processing of various substrate sizes and materials 200 mm and smaller for the automotive and IoT device market. www.screen.co.jp



Lucia D'Urzo (Senior Marketing Manager) graduated in Chemistry at the University of Calabria (Italy) and received her PhD in spectro-electrochemistry from the University of Salento (Italy). She spent 25 years in semiconductors covering various roles in top-ranked IDM, foundries, R&D, OEMs, and materials suppliers in Europe, China, US, and Japan.



SENKO Advanced Components develops, manufactures, markets and distributes hundreds of fibre optic products, providing solutions across the spectrum of fibre optic applications from FTTx, telecom and Datacom applications to broadcast and medical. They aim to be recognized as the global leader for interconnect solutions by providing our customers with the highest quality optical connectivity. The large team of design and manufacturing engineers are supported by test facilities in the US and China. These facilities ensure that products meet and exceed Telcordia and IEC standards. The technical team also benefit significantly from participation in working groups and forums in various industry standards bodies such as IEEE, IEC, INEMI as well fibre optic manufacturer associations like COBO, OSFP and QSFP-DD. www.senko.com



Tiger Ninomiya (Senior Technologist) is currently Senior Technologist at SENKO Advanced Components. He joined SENKO in 2012. In 2016, Tiger was transferred to SENKO's Business Development Division in Massachusetts. Tiger is participating in the MSA and Consortiums including QSFP-DD, OSFP, SFP-DD and COBO. Within COBO, he became a chairman of Co-Packaged Optics working group and Associate Director of Board of Director in 2020. Tiger has been heavily involved in the development and standardization of CS and SN connectors and is continuously innovating new products to further develop optical connectivity technology.



SUSS MicroOptics SA manufactures high-quality refractive and diffractive micro-optics on 200mm wafers for applications in automotive, photolithography, fiber optics, silicon photonics and more. Our production facilities in Neuchatel, Switzerland, exemplify excellence and our volume production line imprints micro-optics for automotive lighting applications. Suss MicroOptics is ISO 9001:2015 and IATF 16949:2016 certified and is a subsidiary of Suss MicroTec SE. www.suss.ch



Wilfried Noell (Director R&D) is responsible for R&D projects, advanced technology, optical designs and special client requests with his dedicated team of scientists and engineers. Before joining SUSS MicroOptics, he was an R&D scientist and process engineer in the industrial x-ray business unit of the COMET AG, Switzerland. From 1994 through 2012, he worked on InP PICs, Silicon Photonics (SiPH), Optical MEMS (MOEMS) and MEMS actuators at TU Darmstadt, IMM Mainz, IMT/Uni Neuchâtel and EPFL, Switzerland, respectively. Since 2021, he is a member of the Swiss NTN Photonics Innovation Board.



Swave Photonics is a fabless semiconductor company that designs and markets holographic chips based on proprietary diffractive photonics technology. Its mission is to bring the metaverse to life and enable display manufacturers and content creators to disrupt the visualization market with immersive, ultra-high-resolution, lifelike, true holographic displays. Swave envisions a world where holographic displays give everyone the power to visualize the impossible, collaborate and accomplish more. www.swave.io



Theodore Marescaux (Founder & CEO) received Master of Engineering in Electronic Systems, Microelectronics in 2000 at Dublin City University, PhD in Electronic Systems at Eindhoven University of Technology (2007) and MBA, General International Management at Vlerick Business School (2008). He started his career at imec in 2000 and worked there till 2007. Then Theodore served as Product Manager at Barco (2008-2014), he is a Founder and CEO at MuseLabs since 2014 and since 2021 - Founder and CEO at Swave Photonics.



TNO is an independent Dutch organisation for applied scientific research with over 3000 employees. Research themes include: Healthy Living, Industrial Innovation, Defence/Safety/Security, Energy, Transport and Mobility, Built Environment, Information Society. www.tno.nl



Peter Harmsma (Senior Scientist) received his PhD from the Delft University in 2000 on the monolithic integration of active and passive components in InP. His current position is senior scientist nanophotonics at TNO, where he applies photonic integrated circuits for a variety of sensing applications. He has a track record in the main material platforms InP, SOI, dielectric waveguides and polymer. Peter is also involved in the biosensing start-up Delta Diagnostics, a spin-off from TNO, and acts as a program manager photonic packaging at the Chip Integration Technology Centre.



TOPTICA



TOPTICA develops and manufactures high-end laser systems for scientific and industrial applications. The portfolio includes diode lasers, ultrafast fiber lasers, terahertz systems and frequency combs. These systems are widely used in quantum optics and spectroscopy, biophotonics and microscopy, as well as test and measurement. www.toptica.com



Holger Quast (Vice President) studied physics and business administration at Goethe University Frankfurt am Main. After his PhD in physics from the Technical University Berlin for his work on high-frequency measurement technology using ultrafast lasers, he left academia to start building business based on novel technologies. Next to being involved in several ventures for various markets, Holger was COO and co-founder of the VCSEL specialist VI Systems GmbH in Berlin, and Co-Founder, COO, and head of business development at the Terahertz imaging specialist SynView GmbH in Bad Homburg. Before Holger joined TOPTICA in October 2019, he had been working for Siemens as Venture Director of the Siemens Technology Accelerator in the area of technology transfer and start-up building. At TOPTICA, Holger uses his experience in successfully bringing technology-driven products to market in his role of Vice President for Materials and Biophotonics.

The Eindhoven University of Technology is the National Center of the Netherlands for Research on III/V semiconductors and optoelectronics. It hosts the Institute of Photonic Integration (IPI, formerly COBRA Research Institute). The IPI employs more than 150 scientists and technicians working on material, device and systems research. IPI is one of the world's leading institutes in the field of Photonic Integration and has a large cleanroom (800 m²) optimized for photonics R&D. Research into photonic integrated circuits is geared to the integration of increasingly more complex and smaller components on a single chip, providing innovative solutions that are faster, smaller, more energy-efficient and cheaper. www.tue.nl



JePPIX is the joint European platform for photonic integrated components and circuits, established in 2006. JePPIX partners are driving foundry services for the wider industrialization of high-performance indium phosphide, silicon nitride and hybrid photonic integration. Services include design, manufacturing and testing, for first prototypes, pilot production and manufacturing.



Kevin Williams (Professor) graduated in Electronic Engineering from the University of Sheffield and received his PhD from the School of Physics at the University of Bath in 1995. He subsequently moved to the University of Bristol where he was awarded a Royal Society university research fellowship to study high speed and high power semiconductor lasers. In 2001, he moved to the University of Cambridge where he was also appointed a Fellow and lecturer at Churchill College Cambridge. In 2006, Kevin moved to the Technical University Eindhoven to take up an EC Marie Curie Chair award. In 2011, he received a Vici award from the Dutch NWO to perform research into large-scale high-performance photonic integrated circuits. He is presently leading the Photonic Integration group at the COBRA research institute.



The Tyndall National Institute, University College Cork is one of Europe's leading centres for Information, Communications and Technology: ICT research and development. It is the largest facility of its kind in Ireland. Tyndall, formally known as the National Microelectronics Research Centre, was established in 2004 to provide a critical mass of researchers that would support the growth and development of a smart knowledge-based economy in Ireland. www.tyndall.ie



Peter O'Brien (Professor) is Head of the Photonics Packaging Group at the Tyndall Institute, University College Cork and Director of the European Photonics Packaging Pilot Line (www.pixapp.eu). He is also Deputy Director of the SFI Centre for Integrated Photonics (IPIC). His research group develops packaging and integration solutions for a range of photonic-based applications including high-speed communications, miniaturised biomedical and diagnostics and remote and autonomous sensing. Prof O'Brien is also a visiting professor at the Optical Science Centre at the University of Arizona. He previously founded and was CEO of a start-up company manufacturing speciality photonic systems for bio-imaging and pharmaceutical product monitoring applications, which he sold in 2009. Prior to this, he was a post-doctoral scholar at the California Institute of Technology in Pasadena, and a research scientist at NASA's Jet Propulsion Laboratory, where he was involved in the development of submillimetre wave devices for remote (space) sensing applications. He received his degree and PhD in Physics from Trinity College Dublin and University College Cork respectively.

UPVfab is the micro-fabrication R&D and pilot line facility at Universitat Politècnica de València. The facility comprises 500 m² cleanrooms ISO-7 (class 10.000) and positions to serve with automation tools for backend processing of semiconductor wafers. www.fab.upv.es



Pascual Muñoz (Director) received his MSc and PhD thesis on Electronic Engineering and Photonics by the Universitat Politècnica de Valencia (UPV), Spain. He is a current Full Professor at the Photonic Research Labs. Prof Muñoz runs a consolidated research line, started in 2005, on prototyping Photonic Integrated Circuits (PICs) in a technology agnostic fashion, where PICs are designed in the best suited technology (Silicon-On-Insulator, Indium Phosphide, Silica on Silicon, Silicon Nitride amongst other) for each application. He has published 50 papers in international refereed journals and over 80 conference contributions. He is a member of the Technical Programme Committees for the European Conference on Integrated Optics (ECIO). From his research line, he co-founded the UPV spin-off company VLC Photonics in 2011, where the PIC design know-how, expertise and tools have been transferred, and he served as CEO from 2011 to 2013. Since 2011, he is a member of the Board of Directors. Dr. Muñoz is a Senior Member of IEEE and Senior Member of the OSA. His current research encompasses PIC design, silicon nitride technologies, hybrid integration and advanced full field PIC test engines. Since 2017, he is leading the initiative to establish UPVfab - the micro-fabrication R&D and pilot line cleanroom facility at UPV.

VLC Photonics is a Spanish company, part of the Hitachi High-Tech group, devoted to providing services and solutions related to the development and introduction to market of systems based on photonic integrated circuits (PICs). Key focus areas are techno-economic feasibility studies and consultancy, in-house PIC design, characterization and test, and full PIC prototyping through external manufacturing and packaging/assembly partners. VLC Photonics, as a fabless design house, works with multiple foundries embracing the generic integration model, and makes use of these fabrication platforms to always chose the most suited process (Silicon-on-insulator, Silica/PLC, SiN/TripleX, InP/GaAs) for the application at hand. VLC Photonics also works closely with foundries to contribute in the building of their Process Design Kits (PDKs), which enables access to state of art technologies. www.vlcphotonics.com



Iñigo Artundo (CEO) obtained the M.Sc. in Telecom Engineering at the Universidad Publica de Navarra (Pamplona, Spain) in 2005, and received his Ph.D. in Applied Physics and Photonics at the Vrije Universiteit Brussel (Brussels, Belgium) in 2009. He has been involved in several national and European research projects and networks of excellence focused on reconfigurable optical interconnects, the design, fabrication and characterization of micro-optic devices, and on flexible access and in-building fiber network architectures. He has worked as a reviewer for several scientific journals and national funding agencies. He holds specializations in Business Financing, Commercial Management and Research, and Strategic Marketing. He is a member of IEEE, SPIE and COIT.

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