EPIC
European Photonics Industry Consortium


13-14 September 2022

# EPIC MEETING ON PHOTONICS at THE FINAL FRONTIER at EUROPEAN SPACE AGENCY (ESA)

Noordwijk, The Netherlands

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## THE EUROPEAN SPACE AGENCY

The European Space Agency (ESA) is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world.

ESA is an international organisation with 22 Member States. By coordinating the financial and intellectual resources of its members, it can undertake programmes and activities far beyond the scope of any single European country.

# EPIC Meeting on Photonics at the Final Frontier at European Space Agency (ESA)

In the last years, photonics is gaining a key enabling technology in space engineering. Optical, opto-electronic, and photonic payloads are currently widely utilized especially for earth observation, sensing and several new payloads based on the same technologies are in the development stage. It is expected that in the next decade, photonics will gain an important role in other sub-system such as data processing/handling and the communications ones. The purpose of this EPIC event at ESA "photonics at final frontier", is to critically review the main and most promising emerging technologies addressing new space applications. We will make highly relevant experts from the industry, but also from the R&D, meet together to bring the discussion to another level. The future of space will be discussed trough 5 sessions, from space-based Lidar technologies, to optical links for inter- and intra- spacecraft communications, including new development for earth observation. We will set up the stage with a session on the role of Human in space exploration, and close the event with a session regarding emerging trends for NewSpace..

## Monday, 12 September 2022

19:00 – 22:00 **Dinner @ Van der Valk Palace Hotel Noordwijk hotel restaurant**
Pickeplein 8 – 2202 CL Noordwijk, The Netherlands

## Tuesday, 13 September 2022

11:00 **Departure by the bus from Van der Valk Palace Hotel Noordwijk hotel to ESA**
(Meet outside the hotel)

12:00 – 13:05 **Registration & Networking lunch @ ESA**

13:00 – 13:05 **Welcoming words by Jeremy Picot-Clemente,**
Photonics Technologies Manager at EPIC – European Photonics Industry Consortium

13:05 – 13:15 **Welcoming words by Kyriaki Minoglou,**
Optoelectronic Section Head at ESA

### SESSION 1 – HUMAN SPACE EXPLORATION

13:15 – 13:45 **KEYNOTE: Terrae Novae – Europe's Path to Outer Space**
Didier Schmitt, Strategy and Coordination Group Leader at ESA (The Netherlands)

13:45 – 14:00 **HAPS (High Altitude Pseudo Satellites) Applications for Earth Observation from Stratosphere**
Jiri Pavlik, Founder & CEO at Stratosyst (Czech Republic)

14:00 – 14:15 **Vision: Qualification of Additive Manufacturing Components Based on Sensor Data Acquired During Fabrication**
Tor Dokken, Chief Scientist at Sintef (Norway)

14:15 – 14:30 **Optofluidics Developments for Life Detection on Mars and Icy Moons**
Henk Leeuwis, Vice President Strategy and Innovation at LioniX International (The Netherlands)

14:30 – 14:45 **Wireless Power to Increase Productivity and Sustainability in Space**
Keval Dattani, CEO at Space Power (United Kingdom)

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

## SESSION 2 – PHOTONICS ADVANCES FOR EARTH OBSERVATION AND MONITORING

15:30 – 16:00 **KEYNOTE: Latest Diffraction Gratings Embedded Solutions on Earth Observation Missions**
William Renard, Sales Engineer at Horiba (France)

16:00 – 16:15 **Photonics in Ground-based Astronomy**
Oliver Pfuhl, Optical Engineer at European Southern Observatory (ESO) (Germany)

16:15 – 16:30 **CMOS SPAD Technology for Space LiDAR Systems**
Leonardo Gasparini, Researcher at Fondazione Bruno Kessler (FBK-irst) (Italy)

16:30 – 16:45 **Ready for New Space – Novel Glass Solutions for Earth Observation**
Daniel Vasseur, VP Global Sales & Market Development at SCHOTT (France)

16:45 – 17:00 **Qualification of Novel Wavelength-Specific UVC Sensors for Space-Based Monitoring of the Herzberg Continuum (200–242nm) and its' Impact on Climate Change**
David Rogers, Founder/Director at nanovation (France)

17:00 – 17:45 **Networking coffee break**

## SESSION 3 – SPACE BASED LIDAR SYSTEMS

17:45 – 18:15 **KEYNOTE: New Space Flash LiDAR: Development Trade-Offs and Applications**
Christophe Pache, Group Leader at CSEM (Switzerland)

18:15 – 18:30 **Development of a Massively Parallel 3D Metrology Instrument for In-Orbit Operation**
Gregory Pandraud, VP Research at Ommatidia LIDAR (The Netherlands)

18:30 – 18:45 **Tristan Allouis, CTO at YellowScan (France)**

18:45 – 19:00 **High-resolution Solid-state Scanning LIDAR for In-Orbit Servicing Applications**
Jordi Riu, CEO & Founder at Beamagine (Spain)

19:00 – 19:15 **Space-Qualified Scanning LIDAR for Rendezvous and Docking Applications**
Thomas Kämpfe, System Engineer at Jena Optronik (Germany)

19:15 – 19:30 **Hybrid Integrated Photonics for Coherent LiDAR**
Anton Lukashchuk, Swiss Federal Institute of Technology Lausanne (Switzerland)

19:30 **Departure by the bus from ESA to the dinner place**

19:45 – 22:30 **Networking dinner @ Strandpaviljoen "de Zeemeeuw"**
Koningin Wilhelmina boulevard, Afrit 18 – Noordwijk

22:40 **Walk to the Hotel**

## Wednesday, 14 September 2022

08:00 **Departure by the bus from Van der Valk Palace Hotel Noordwijk hotel to ESA**
(Meet outside the hotel)

08:30 – 08:55 **Morning coffee @ ESA**

08:55 – 09:00 **Recap and introduction to the 2nd day**
Jeremy Picot-Clemente, Photonics Technologies Manager, EPIC – European Photonics Industry Consortium

## SESSION 4 – OPTICAL LINKS FOR INTER AND INTRA SPACECRAFT COMMUNICATIONS

09:00 – 09:30 **KEYNOTE: Optical Communication Terminals in Space 2022**
Nils Hoepcke, Lead System Engineer at TESAT (Germany)

**IntraSpacecraft Communication**

09:30 – 09:45 **Miniaturized Photonic Integrated Circuits & Modules for New-Gen Satellite Optical Communications**
Leontios Stampoulidis, Founder at LEO Space Photonics R&D (Greece)

09:45 – 10:00 **Monolithic Integration of Photonics and Electronics for High-Capacity Co-Packaged Optical Engines**
Georg Roell, CTO at Ranovus (Germany)

10:00 – 10:15 **Low Power Consumption High Data-rate Optical Transceivers**
Una Marvet, Head of Design Centre at ALTER TECHNOLOGY TÜV NORD UK (United Kingdom)

10:15 – 10:30 **Ruggedised Opto-electronic Components for Multi-Gigabit Onboard & Inter-satellite Optical Communications in Space**
Davinder Basuita, Business Development Manager at Glenair (United Kingdom)

**InterSpacecraft Communication**

10:30 – 10:45 **Optical Link for Spacecraft to Ground**
Jean-Francois Morizur, CEO at Cailabs (France)

10:45 – 11:00 **Hakimeh Mohammadhosseini, Technical Lead at Antwerp Space (Belgium)**

11:00 – 11:15 **WDM Optical Front End for GEO-Ground Digital and Analog Telecommunications – ESA FOLC2**
Clement Guyot, Space Products Product Line Manager at iXblue (France)

11:15 – 11:30 **Low Latency Global Point-to-Point Connectivity Realised with Optical Intersatellite Links – a System Overview**
Thomas Laurent, Business Development Director at Rivada Space Networks (Germany)

11:30 – 12:15 **Networking coffee break**

## SESSION 5 – EMERGING TRENDS IN PHOTONICS FOR NEWSPACE

12:15 – 12:45 **KEYNOTE: Photonic Integration for Space Applications**
Martijn Heck, Professor at Eindhoven University of Technology & Scientific Director at EHCI – Eindhoven Hendrik Casimir Institute (The Netherlands)

12:45 – 13:00 **Custom PIC Development for Space Exploration**
Katarzyna Ławniczuk, VP Senior Photonics Engineer at Bright Photonics (The Netherlands)

13:00 – 13:15 **Design For Assembly (DFA) for Hybrid Integration of Prototype PICs**
Erwin Vergeest, Business Developer at PHIX (the Netherlands)

13:15 – 13:30 **The New AI-powered Search Specialised for Optics & Photonics Components and OEM Projects**
Barbara Buades, CEO at MeetOptics (Spain)

13:30 – 13:45 **Space Frequency Comb for In-Orbit-Demonstration in Low-Earth-Orbit**
Frederik Böhle, Project Manager at Menlo Systems (Germany)

13:45 – 14:30 **Networking lunch**
14:30 – 15:30 **Tour at ESA**
15:45 **Bus from ESA to Schiphol airport / Central station, Amsterdam**

## CONTACTS

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# Participants

| Name | Surname | Job Title | Company | Country |
|---|---|---|---|---|
| Alexander | Telle | CEO | ACM Coatings | Germany |
| Andrés | Cifuentes | CEO | ASE Optics Europe | Spain |
| Anna | Trachtova | Marketing Manager | EPIC | Czech Republic |
| Anton | Lukashchuk | Researcher | EPFL | Switzerland |
| Antreas | Theodosiou | Founder | Lumoscribe | Cyprus |
| Axel | Guede | Technical Sales Engineer | SEDI-ATI Fibres Optiques | France |
| Barbara | Buades | CEO | MeetOptics | Spain |
| Brian | Shortt | Applied Physicist | ESTEC, European Space Agency | The Netherlands |
| Bruno | Leone | Physicist | ESTEC, European Space Agency | The Netherlands |
| Charlotte | Bringer | Photonic Components Engineer | ESTEC, European Space Agency | The Netherlands |
| Christophe | Pache | Group Leader | CSEM | Switzerland |
| Clément | Guyot | Space Products Product Line Manager | IXBLUE PHOTONICS | France |
| Daniel | Vasseur | VP Sales & Market Development | SCHOTT | France |
| Daniel | Achenbach | Segment Marketing Manager | Physik Instrumente (PI) | Germany |
| Daniela | Salvoni | Sales Manager | Photon Technology | China |
| David | Rogers | Director | Nanovation | France |
| Davinder | Basuita | Business Development Manager | Glenair | Germany |
| Didier | Schmitt | Head of the Strategy & Coordination Group | ESTEC, European Space Agency | The Netherlands |
| Dominykas | Puzinas | Sales Engineer | OPTOMAN | Lithuania |
| Donatas | Miklusis | Young Graduate Trainee | ESTEC, European Space Agency | Lithuania |
| Eamonn | Murphy | Laser and Optoelectronics Systems Engineer | ESTEC, European Space Agency | The Netherlands |
| Eberhard | Moess | Senior Expert | Tesat Spaccom | Germany |
| Eric | Markus | Area Sales Manager | Glenair | Germany |
| Erwin | Vergeest | Business Developer Photonic Packaging | PhiX | The Netherlands |
| Fabrizio | Silvestri | Optical Designer - Architect | TNO Optics | The Netherlands |
| Florian | Emaury | CEO | Menhir Photonics | Switzerland |
| Francesca | Brambilla | Technical Manager | Tecnottica Consonni | Italy |
| Frederik | Böhle | Project Manager | Menlo Systems | Germany |
| Georg | Roell | CTO | Ranovus | Germany |
| Giuliano | Piccinno | CEO | Bright Solutions | Italy |
| Gregory | Pandraud | VP Research | Ommatidia Lidar | The Netherlands |

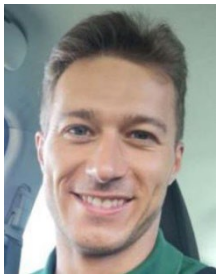
| Name | Surname | Job Title | Company | Country |
|---|---|---|---|---|
| Guy | Ear | CEO | Optosigma | France |
| Hakimeh | Mohammadhosseini | Photonics Technical Lead | Antwerp Space | The Netherlands |
| Henk | Leeuwis | VP Startegy and Innovation | LioniX International | The Netherlands |
| Herve | Gouraud | Photonics Sales Director | IXBLUE PHOTONICS | France |
| Iain | McKenzie | Senior Engineer | ESTEC, European Space Agency | The Netherlands |
| Ignazio | Piacentini | Consultant | IP Consulting | Italy |
| Jean-François | Morizur | CEO | Cailabs | France |
| Jeremy | Picot-Clemente | Photonics Tecnnology Manager | EPIC | France |
| Jiří | Pavlík | Founder & Chief Executive Officer | STRATOSYST | Czech Republic |
| Jordi | Riu | CEO | Beamagine | Spain |
| Kamil | Pierściński | IR Photonics Research Group Leader | Łukasiewicz - Institute of Microelectronics and Photonics | Poland |
| Karolina | Sedlackova | Project Manager | asphericon | Czech Republic |
| Kasia | Balakier | Space Segment Engineer | ESTEC, European Space Agency | The Netherlands |
| Katarzyna | Lawniczuk | VP | Bright Photonics | The Netherlands |
| Keval | Dattani | CEO | Space Power | United Kingdom |
| Kévin | Cognée | Photonics Engineer | Ommatidia Lidar | The Netherlands |
| Kyriaki | Minoglou | Optoelectronic Section Head | ESTEC, European Space Agency | The Netherlands |
| Leonardo | Masi | Reasearcher | Aerospazio Tecnologie | Italy |
| Leonardo | Gasparini | Head of Unit | FONDAZIONE BRUNO KESSLER | Italy |
| Leontios | Stampoulidis | Company Founder | LEO Space Photonics | Greece |
| Malik | Onal | Regional Sales Manager | Edmund Optics | Germany |
| Malte | Ennen | Sales Engineer | ficonTEC | Germany |
| Martijn | Heck | Professor | Eindhoven University of Technology | The Netherlands |
| Martin | Simon | CEO | Marduk Technologies | Estonia |
| Najib | Hatoum | Account Manager | VIAVI SOLUTIONS | Germany |
| Neringa | Noreikiene | Events Manager | EPIC | Lithuania |
| Nils | Höpcke | Lead System Engineer | Tesat Spacecom | Germany |
| Oliver | Pfuhl | Optical Engineer | European Southern Observatory | Germany |
| Ondrej | Matousek | CTO | asphericon | Czech Republic |
| Otakar | Kuchař | Structural Engineer | STRATOSYST | Czech Republic |
| Paulus | Van Dijk | VP Strategy and Innovation | LioniX International | The Netherlands |
| Philippe | Younès | Gratings & OEM Solutions Director | HORIBA | France |

| Name | Surname | Job Title | Company | Country |
|---|---|---|---|---|
| Pol | Ribes Pleguezuelo | Photonics Engineer | ESTEC, European Space Agency | The Netherlands |
| Sarah | Wittig | Photonic Components Engineer | ESTEC, European Space Agency | The Netherlands |
| Thomas | Kämpfe | Systems Engineer | JenaOptronik | Germany |
| Thomas | Laurent | Business Development Director | Rivada Space Networks | Germany |
| Tor | Dokken | Chief Scientist | SINTEF Digital | Norway |
| Tristan | Allouis | CTO | YellowScan | France |
| Una | Marvet | Head of Design Centre | Alter Technology | United Kingdom |
| Vidmantas | Tomkus | Researcher | FTMC | Lithuania |
| Viktorija | Piaulokaite | Young Graduate Trainee | ESTEC, European Space Agency | Lithuania |
| William | Renard | Sales Engineer Custom Gratings | HORIBA | France |

**ACM Coatings** is the German subsidiary of Acktar Ltd. (Israel) and your production and distribution partner for Acktar products in Germany and Europe. Acktar Ltd. is the world leader in deep black, light absorbing coatings and materials. ACKTAR absorbing coatings and foils enhance the performance of an optical system, e.g. by reducing the signal-to-noise ratio and increasing the contrast. The coatings are completely inorganic, non-toxic and non-outgassing. ACKTAR coatings are applicable to a large number of substrates, have a high level of temperature stability (-269°C to +450°C) and are working in a wide spectral range (UV to IR). Applications for these deep black coatings are: Stray light absorption in optical systems, such as: portable devices, cameras for mobile phones, automotive applications, sensors and receivers, gauges, pyrometers, spectrometers as well as high-emissivity applications in the technical optics. We serve for example the industries aerospace, laser technology, technical optics, sensor technology, medical technology, biotechnology and industrial image processing. **www.acktar.com**

**Alexander Telle (CEO)** joined Acktar/ACM in 2015 and took responsibility for the business development in the European market, especially for industrial photonic customers and aerospace business. He had previously held director and senior management positions in several photonics companies. He started his career in 2005 as an R&D engineer at JENOPTIK. Alexander holds an engineering degree (Dipl.-Ing. (FH)) from Ernst-Abbe-University Jena.

**Aerospazio Tecnologie** was set up in March 2000 with the aim of providing high qualified test services in the fields of Electric Propulsion and Thermal Vacuum thanks to a large number of special test facilities. Together with the consolidated intrusive diagnostics, one of the research field is the development of all optical diagnostic tools and methods, able to characterize the investigated system in a non-intrusive way. In parallel, the company has started to invest in the development of optical communication systems for satellites, with the aim of designing and assembling compact platforms that will allow the realization of optical links for future constellations of small satellites. **www.aerospazio.com**

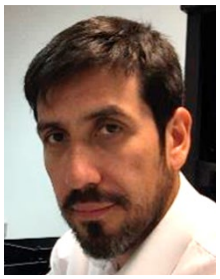


**Leonardo Masi (Research Engineer)** received a PhD in Physics at the University of Florence and during many years of experience at LENS (European Laboratory for Non-linear spectroscopy), he gained expertise in laser and optical techniques for the investigation of atomic samples, precision measurements and interferometry. Currently, he is a young researcher in the R&D optics and photonics group at Aerospazio, where he is working on the development of optical and photonics diagnostics for on-earth testing facilities and on the development of laser systems for optical communication in space.

**ALTER TECHNOLOGY** is a quality driven company providing procurement, engineering and test services for E.E.E. (Electrical, Electronic and Electromechanical) components and electronic systems, within the space and harsh environment markets, where failure is not an option. ALTER TECHNOLOGY works in many markets including, but not limited to, Aerospace, Security, Transport, Emergency Services, Health & Safety and Automotive. **www.altertechnology.com**

**Una Marvet (Head of Design Centre)** is the Head of Design Centre at Alter Technology UK. She has a PhD in ultrafast spectroscopy and a successful track record in commercialising products for technology markets, with 14 years' experience in Telecommunications as an application engineer and product line manager and 6 years' experience in Aerospace and Defence as a product manager and programme manager.

**ASE Optics Europe** specializes in design, engineering, and development of precision and fully integrated optical, optomechanical and optoelectronic systems. With our rigorous systems approach and creative problem-solving processes, we design optical systems that improve reliability and performance. Our focus on optical engineering is based on the needs of our customers. ASE has the experience and resources to meet precision optical systems assembly for prototyping as well as short series production. We can achieve the stringent specifications required by the high-end applications of our customers, across a broad range of application areas: defense and security, industrial inspection, scientific and medical instrumentation, aerospace, big scientific projects. **www.aseoptics.com**



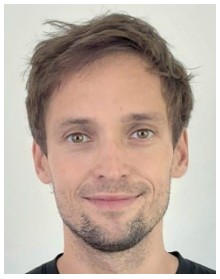
**Andres Cifuentes (CEO)** has worked as a research technician, optical engineer, and optics manager on projects ranging from thermal imaging, visual optics, illumination systems, anamorphic imaging lens or optical metrology systems, applied to markets such as medical, defense and security, automotive or industrial metrology. Currently, he runs ASE Optics Europe and has thrust the company into optical systems solutions for fusion environments, in low light optical systems, OCT optical metrology, thermal systems for security or optical systems for medical applications, while leading a team of innovative scientists and engineers.

**Antwerp Space** is a leading Belgian Space company active in the field of Space based RF applications. It is part of OHB SE, a European Space and Technology group that currently employs over 3000 people. Antwerp Space's core business is in the delivery of satellite communication, navigation and radar solutions as well as instruments for scientific and exploration missions. The company activity started in 1962 with today's facilities in Antwerp and Leuven. **www.antwerpspace.be**

**Hakimeh Mohammadhosseini (Photonics Technical Lead)** is the Photonics Technical Lead Engineer at Antwerp Space, working on PICbased solutions for satellite radar, RF communication and laser communication applications. She received the M.Sc. degree in Photonics in 2013, followed by a Ph.D. degree in Photonic Integrated Circuits (PIC) in 2018 from University of Aarhus, Denmark. She was a visiting researcher at Gent Photonics Research Group during 2015 and 2018. Currently she works on PICbased solutions and it's applications in Q/V band frequency convertors, photonic lantern receivers, spaceborne SCORE Radar receivers, and Quantum Random Number Generators (QRNG). Hakimeh is an early career member of Optica and coordinates ESA Young Space Optic Professional Group (YSOP). She is also a committee member of International Conference on Space Optics (ICSO) 2022.

**asphericon** has the passion for revolutionizing the manufacturing of optical elements with new technologies, which is changing the degree of precision and quality that is possible. By combining a worldwide unique CNC control technology with high-end manufacturing processes, we routinely achieve unique levels of dimensional precision for optical components, assemblies and systems. **www.asphericon.com**

**Karolína Sedláčková (Project Manager)** has joined asphericon after completing master studies in optical and laser technologies. In ashpericon she works as project manager, where she is responsible for research projects focused on innovating optical manufacturing as well as new production approaches.



**Ondřej Matoušek (CTO)** received his PhD in field of special interferometric techniques from Technical university of Liberec. From 2013, he is a member of research group for non-standard optical elements in Institute of plasma physics, Czech academy of sciences. During that time, he took part of several international projects also in cooperation with ESA for example METIS or FLEX Floris. He was at the establishing of the Czech branch of asphericon in 2016, where he currently works as CTO and where he is responsible for four R&D projects.

**BRIGHT Photonics** is an independent design house for photonic integrated circuits (PICs), founded in 2010 and the first commercial PIC design house to provide access to generic PIC foundry technology. Our office is located in the photonics heart of the Netherlands, Eindhoven. Bright makes PIC technology accessible to businesses, research institutes and universities. BRIGHT provides photonic engineering support, concept studies, product development support, prototyping and brokering, and design support on component and/or mask level. We work with technologies as SoI, InP, SiN, glass/PLC and polymers for custom, commercial and research foundries. Bright Photonics also shares the open source design platform "Nazca Design" with the photonics community to stimulate open innovation, standardization and education in photonics. **www.brightphotonics.eu**

**Katarzyna Ławniczuk (Vice President and Senior Photonics Engineer)** was awarded a joint Ph.D. degree from TU/e, the Netherlands, and Warsaw University of Technology, Poland, in 2014. Her research focused on Indium Phosphide-based multiwavelength lasers and photonic integrated transmitters. Katarzyna was the coordinator of JePPIX at Eindhoven TU/e from 2013 to 2016.

**Beamagine** was born for commercializing imaging lidar sensors built on proprietary technology awarded by multiple patents granted all over the world. The company relies in accumulated knowledge in its engineers accumulated in twenty years of lidar, optomechanical, electronics and software development. Since then we've been developing innovative solutions and imaging lidar sensors to automotive, railway, maritime and space users, always in applications with demanding point cloud density or demand of sensor fusion procedures. **www.beamagine.com**

**Jordi Riu (CEO)** is CEO and Co-Founder at Beamagine since 2016. He has MSc in Electronics, MSc in Business Administration and Management and PhD in Optical Engineering. He has developed a PhD related to solid-state MEMS based imaging LIDAR. He has been working in hardware developments for LIDAR imaging along the last 10 years. He holds 12 patents and various articles in scientific magazines.

**Bright Solutions** develops and manufactures state-of-the-art ns, sub-ns DPSS lasers and high brightness diode laser modules. Our DPSS standard portfolio includes efficient, compact and reliable sources at 1064nm, 532nm, 355nm, 266nm, 1.5um, 3um suitable for industrial and medical and applications. Our custom products represent the state of the art of laser sources for aerospace LIDAR instruments used worldwide, for example, in high precision topography, bathimetry and 3D submarine vision. Our product range has been recently completed by a full line of DPSS Q-switched microchip lasers emitting in the UV, blue, green and IR wavelengths. **www.brightsolutions.it**

**Giuliano Piccinno (CEO)** received his degree in electronic engineering from the University of Pavia. He collaborated with the Laser Source Laboratory at the same University from 1994 to 1997, being the coordinator of several industrial R&D programs. In 1998, he co-founded Bright Solutions as an engineering company focused on research and development of solid state lasers and systems. In 1998-2003, he has been a member of the Board of Directors of Laservall SpA (presently Datalogic Automation). In 2005, he promoted the new deal of Bright Solutions as a leading industrial solid state laser manufacturer. Among the activities carried out in Bright Solutions, the coordination of several R&D projects oriented to laser industrial and aerospace applications. He is co-author of more than 20 scientific publications and as many as 10 patents/applications on DPSS lasers.

**Cailabs** was established in 2013 in Rennes and is a French deep-tech company which designs, manufactures and sells photonic solutions. By combining our state-of-the-art beam shaping technology (Multi-Plan Light Conversion or MPLC) with optimal engineering, we create innovative products that help solve some of today's major industrial and technological challenges for multiple applications, including: laser machining processes, aerospace, ground-based telecommunications, defense. **www.cailabs.com**

**Jean-Francois Morizur (CEO)** is Co-Founder and CEO of Cailabs. He invented the Multi-Plane Light Conversion Technology at the core of Cailabs' solutions. Before founding Cailabs, Jean-Francois was Senior Associate at the Boston Consulting Group. Jean-Francois holds a PhD in quantum optics from the Universite Pierre et Marie Curie and the Australian National University. He received the Forbes' 30 under 30 Science and Healthcare European award in 2016.

**The Center for Physical Sciences and Technology: FTMC** is the largest state research institute in Lithuania with ~ 750 employees, including 230 PhD and 55 PhD students, and 19 departments, working in different field of physics, chemistry and technology. The Department of Laser Technologies covers nano-photonics, laser science and applications, including modelling of nano-photonic structures, new design of fiber and solid-state based lasers, their application in the precise material processing and optical classical and quantum communications. The Department of Optoelectronics is world known on its activities in terahertz generation and imaging. Its facilities include equipment for MBE growth of dilute bismide layers for infrared light emitters and photo-detectors. Various ultrafast spectroscopy methods are widely used in the Department of Molecular Compounds Physics for studies of excitation dynamics in molecular compounds seeking the control operational abilities of molecular optoelectronic devices. **www.ftmc.lt**

**Vidmantas Tomkus (Researcher of Department of Laser Technologies)** graduated from Vilnius University, Faculty of Physics in 1985 and worked in the Institute of Semiconductors of Lithuania 1985 - 1990. Starting from 1994, he held different leading positions in Telecommunications and Satellite industry like CTO at Radio M-1, CEO at Dicto Citius UAB and Arcus Novus UAB, and Telecom and Quantum program manager at Astrolight UAB. Vidmantas led the development and construction of Satellite Teleport and Data Centre in Liepiskes, Vilnius region in 2010-2012. In 2010, he was assigned as FP7 and Horizon 2020 Space expert from Lithuania. In 2012-2014, Vidmantas contributed as Chief Technical Officer to the launch of Litsat-1 being one of first Lithuanian satellites. Since 2015, he is engaged in the research in the Centre for Physical Sciences and Technology (FTMC) of Lithuania. In 2021, Vidmantas has received PhD degree in Material Engineering. His research areas include excitation of secondary radiation with high Intensity laser fields and quantum communications.

**CSEM: Swiss Center for Electronics and Microtechnology**, founded in 1984, is a private applied R&D center. Our 550-strong workforce specializes in micro- and nanotechnologies, systems and surface engineering, low-power information and communications technologies, and photonics. The main focus of CSEM's photonics program is the development of optoelectronics components and their optimal integration into innovative products. Our technologies are able to address the needs of a very wide range of fields, from healthcare, watch-making, aerospace, security and medical, to consumer electronics and cleantech. **www.csem.ch**

**Christophe Pache (Group Leader - Sensing & Control)** is responsible for a group of 13 engineers active in system design with a focus on LiDARs, systems control and mechatronics at CSEM. He received his M.Sc. degree in Microengineering in 2008 and his PhD in biomedical imaging in 2012, both from the Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland. From 2013 to 2020, he worked as system engineer and project manager for the development of LiDARs and optical systems in general, first in a start-up company and since 2015, at CSEM.

**The Eindhoven University of Technology** is the National Center of the Netherlands for Research on III/V semiconductors and optoelectronics. It hosts the Eindhoven Hendrik Casimir Institute (EHCI). EHCI employs more than 300 scientists and technicians working on material, device and systems research. EHCI 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, and the integration with electronics, providing innovative solutions that are faster, smaller, more energy-efficient and cheaper. **www.tue.nl**

**Martijn Heck (Professor)** has a PhD in electrical engineering from Eindhoven University of Technology, the Netherlands, on the topic of photonic integration, where he is currently a full professor (since 2020) and the Scientific Director of the Eindhoven Hendrik Casimir Institute (since 2021). Previously, he was a postdoctoral researcher at the Free University of Amsterdam (2008-2009) and the University of California Santa Barbara, US (2009–2013), and an Associate Professor at Aarhus University, Denmark (2013–2020). His research is focused on photonic integration, from technology development, including heterogeneous integration techniques, to applications in sensors, microwave and terahertz photonics, quantum technology and chip-to-chip and on-chip interconnects.

European Southern Observatory

**The European Southern Observatory (ESO)** is the pre-eminent intergovernmental science and technology organisation in astronomy. It carries out an ambitious programme focused on the design, construction and operation of powerful ground-based observing facilities for astronomy, in order to enable important scientific discoveries. ESO also plays a leading role in promoting and organising cooperation in astronomical research. **www.eso.org**

**Oliver Pfuhl (Optical Engineer)** received a Ph.D. degree in Astronomy from the Ludwig-Maximilian-University, Munich in 2012. From 2012 to 2019, he spent a Post-Doc at the Max-Planck Institute for extraterrestrial Physics in the group of Reinhard Genzel (Nobel Laureate 2020). He played a leading role in the development of the GRAVITY interferometer and the observation of the supermassive black hole at the center of our Galaxy. In 2016, he received the MERAC prize of the European Astronomical Society for his contributions to astronomical instrumentation. Since 2019, Oliver is working at the European Southern Observatory as an Optical Engineer and Researcher, with a special focus on the development of photonic components for ground based astronomy.

**Edmund Optics (EO)** is a leading global manufacturer and distributor of precision optics, optical assemblies and imaging components with headquarters in the USA, manufacturing facilities in the USA, Europe and Asia and a global sales network. With a portfolio of approximately 35.000 products, EO has a very large inventory for immediate delivery and offers products, whether standard or customized, whether in small quantities or large volumes, for various industries such as life science, industrial measurement & testing, research & development, and more. With a global team of experts in optical design and manufacturing, EO is ready to enable today's projects - from prototyping all the way to serial production. Committed to superior service, Edmund Optics supports its customers to bring their next projects to success and ensures the solutions of tomorrow – as we all believe that the future depends on optics. **www.edmundoptics.com**

**Malik Onal (Regional Sales Manager)** received Bachelor degree in Economics from Inholland University of Applied Sciences in 2008 and from Bilkent University in 2007. He started his career as Sales Engineer and Marketing Manager at DVC Machinevision (2006-2009), then he served as Sales Engineer at IDIS Nederland (2009-2012), Key Account Manager at Heijmans Infra (2012-2013), Senior Sales Engineer at IDIS Nederland (2014-2016), Business Development Manager at Cognex Corporation (2017-2022) before he joined Edmund Optics in February 2022 as Regional Sales Manager.

**EPFL** is one of most innovative scientific institutions ranked in the top 3 in Europe. Laboratory of Photonics and Quantum Measurements (LPQM) at EPFL focuses on ultra-high Q optical and mechanical micro- and nanostructures and their application for exploring mechanical systems in the quantum regime, and as sources of photonic integrated optical frequency combs. Foundational to these activities is an extensive research program in semiconductor processing and the development of novel fabrication methods. The LPQM team spearheads the development of the field towards compact, scalable and robust chip-scale optical comb sources. It has developed the photonic Damascene process enabling the fabrication of ultra-high-Q silicon nitride microresonators at a wafer scale. Researchers at LPQM have built a photonic integrated, compact, and portable soliton microcomb source recently and have demonstrated first turn-key prototypes. **www.epfl.ch**

**Anton Lukashchuk (Researcher)** joined LPQM led by Tobias Kippenberg at EPFL in 2018. His research focuses on integrated photonics, nonlinear optics, frequency combs and LiDAR. He is a recipient of a PhD fellowship offered by European Space Agency - "Photonic integrated coherent LiDAR engine". Within the scope of the project he develops hybrid electro-optical circuit for the next generation LiDAR.

**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**

**Anna Trachtova (Marketing Manager)** has studied at the University of Economics in Prague and has been working in B2B marketing for more than ten years. She started her career in companies such as PricewaterhouseCoopers and ManpowerGroup. Before joining EPIC, she had worked as a marketing manager in one of the biggest law firms on the Czech market, where she was responsible for the whole marketing department. She has vast experience and knowledge in digital marketing, organizing events and project management with focus on marketing activities.

**Jeremy Picot-Clemente (Photonics Technologies Program Manager)** is a physicist specializing in optics. After a PhD in Physics/optics and an MBA in Dijon (France), he decided to explore the photonics industry for several years by managing photonics systems integration for various applications and in different companies. At EPIC, Jeremy oversees the development of the optics and micro-optics fields, and all related technologies and applications. He has a strong interest in new technologies involving photonics, such as AR/VR, LiDAR, 3D sensing, and imaging devices.

**Neringa Noreikienė (Events Manager)** is conferences and events professional with interest and experience in HR, marketing, and sales. Her previous background includes extensive experience in talent acquisition, events & PCO (professional conferences organizer) companies where she was responsible for team management. She has organized numerous international events from 50 up to 2000 people, in Europe and USA. Neringa graduated in business information management as BA (2012, Lithuania), human resources management as MA (2015, Lithuania) and was studying international events management during her exchange semester (2010, the Netherlands).

**The European Space Agency (ESA)** is Europe's gateway to space. Its mission is to shape the development of Europe's space capability and ensure that investment in space continues to deliver benefits to the citizens of Europe and the world. The European Space Agency has sites in several European countries, but the European Space Research and Technology Centre (ESTEC) in Noordwijk, the Netherlands, is the largest. ESTEC is our technical heart - the incubator of the European space effort - where most ESA projects are born and where they are guided through the various phases of development. **www.esa.int**

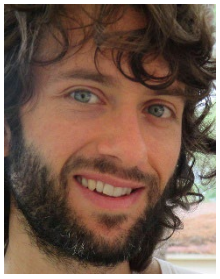
**Didier Schmitt (Head of the Strategy & Coordination Group)** is Head of the Strategy and Coordination Group for human and robotic exploration at the European Space Agency. From 2009 to 2018, he was stationed in Brussels, successively in the European Commission Space Policy Unit, as adviser to the President of the EC on science technology foresight, and at the EU diplomatic service dealing with space and security. Previously he was head of Life Sciences for human spaceflight at ESA-ESTEC and beforehand Associate Professor at the Toulouse medical school and at the International Space University. His educational background is PhD in biosciences and certified medical doctor (including mountain emergency medical care and aerospace medicine). His academic work brought him to various places like Cape Canaveral for scientific experiments on Shuttle-Spacelab programme and to Star City near Moscow for experiments on the Mir space station. In 2016-2017, he was part of an Antarctic inland logistics expedition. As a polpularizer, he authored several books and was an active opinion writer in the top French press. He also authored "All you need is Space", a comic booklet by the EU, distributed at 1 million copies in 25 languages. More recently, he started a fiction science comic series (Red Safari) and is chief editor of a magazine-book series on space and exploration (Mook Mars).

**Eamonn Murphy (Laser and Optoelectronics Systems Engineer)** studied Experimental Physics at University College Dublin (UCD), followed by research in spectroscopy and lasers (UCD-Department of Physics). DLR-Oberpfaffenhofen (Institute of Optoelectronics) followed by DLR Stuttgart (Institute of Technical physics), in the development of airborne laser sensor subsystems. Trinity College Dublin (TCD) Physics department funded by Optronics-Ireland on fiber laser sensor applications. From 2000 until today based at ESA-ESTEC in Noordwijk in The Netherlands.

**Iain McKenzie (Senior Optoelctronic Engineer)** is currently managing the research and development of fibre optic and photonic components for future space applications. He received the B.Eng. degree in electronic and electrical engineering and the M.Phil. degree in optoelectronics from the University of Strathclyde, Glasgow, U.K., in 1991 and 1993, respectively. Since 2002, he has been working with the European Space Agency. His research interests include optical communications, optical fibre sensors, microphotonics, optopyrotechnics and optoelectronic packaging for harsh environments.

**Kyriaki Minoglou (Optoelectronic Section Head)** received the MEng degree in Electrical Engineering from the Aristotle University of Thessaloniki, Greece, and a second M.Sc. degree in Microlectronics from the Department of Informatics, University of Athens, Greece, in 2000 and 2002, respectively. In 2007, she received her Ph.D. degree on Optoelectronics for the work with the Institute of Microelectronics, National Center for Scientific Research (NCSR) "Demokritos," Greece, on the design of laser optical systems and optical system electronic interfaces. She then joined the "Imager and Pixel Design Team" of imec, Belgium, and was charge of the characterization of high-end CMOS image sensors and contributing to the design of photodetector arrays. In 2014, she joined the Opto-electronics Section of ESA as Opto-electronics Engineer. Currently, as the Head of the Optoelectronics Section since 2020, she is managing the Section's contributions to ESA Payload technology developments for Earth Observation and Science Missions and she is responsible for the coordination of the R&D activities in the fields of detectors, lasers, optical communications, photonics, lidars and quantum technologies.

**FBK (Fondazione Bruno Kessler)** is a private, non-profit R&D center owned by the Autonomous Province of Trento, in northern Italy. The foundation has as its objectives both scientific excellence and innovation and technology transfer to companies and public services. The Center for Sensors & Devices focuses its activity on silicon technology for integrated circuits, custom sensors, MEMS, photonics and advanced materials, achieving scientific developments of absolute international value. The combination of these technologies is unique and empowers the development of highly customized microelectronic systems. **www.fbk.eu**



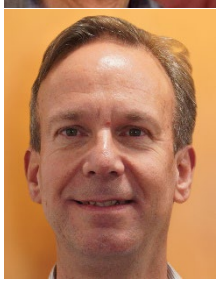
**Leonardo Gasparini (Researcher - Head of the IRIS Unit)** holds a Ph.D. in Information and Communication Technologies from the University of Trento, Italy (2011), working with ultra-low-power camera systems. Since 2010, Leonardo works as a researcher at the Center for Sensors & Devices of Fondazione Bruno Kessler, where he is currently leading the Integrated Readout-ASIC & Image Sensors (IRIS) research unit. Here, Leonardo is engaged in the development of CMOS image sensors, including single-photon detector arrays for Time-of-Flight/LiDAR systems, bio-/medicine, particle physics and quantum optics.

**ficonTEC** provides automated micro-assembly and testing solutions for the photonics industry. These solutions are realized as cutting-edge, semi- or fully-automated production systems, regardless of the device material and of the specific application the device is targeting. Our modular system architecture is additionally scalable, so that exploratory, proof-of-process assembly as well as high-volume assembly and test requirements are addressable – and anything in between. **www.ficontec.com**

**Malte Ennen (Sales Engineer)** graduated from Carl von Ossietzky University Oldenburg in 2017 with focus on engineering physics and photonics. He carried out research in the field of system design and concepts for laser micro processing machines. After leaving academics, he served as a project manager at Pulsar Photonics to develop custom laser machines for micro processing applications and as sales engineer at SmarActs metrology division where he was strongly involved in projects regarding semiconductor and fundamental research applications. At ficonTEC he is responsible for discussing requirements and proposing solutions to customers applications.

**Glenair** began operations in 1956 to produce electrical connector accessories. Building on that foundation, we now offer numerous full-spectrum product lines designed to meet every interconnect requirement including a broad range of military qualified and harsh environment connectors, cable assemblies, wiring harnesses, conduit, braid and accessories. Our products are used in diverse markets including space, defence, avionics, sub-sea, nuclear power, mass transportation, oil & gas, big science installations and more. Glenair's photonic and fibre optic solutions include optoelectronic connector contacts, digital transceivers and optical media converters addressing data rates from a few Mb/s to ribbon optical fibre based solutions to 100Gb/s with single wavelength, CWDM and DWDM wavelength plans. Our space grade high power (up to 10W) optical amplifiers combined with our high-power handling optical connectors and DWDM optical transceivers offer robust solutions for free space optical inter-satellite links for applications ranging from CubeSats to high-throughput telecom satellites. Glenair also offers RF-over-Fibre solutions up to 35GHz. **www.glenair.co.uk / www.glenair.com**

**Davinder Basuita (Business Development Manager)** is a Business Development Manager at Glenair where is responsible for promoting photonic and fibre optic technologies for harsh environment applications. Prior to this, he was Sales Director, EMEA at Emcore Corporation working with high speed photonics technologies for telecom and CATV. Davinder was a co-founder of K2 Optronics (acquired by Emcore Corporation) and, during his earlier career, has held photonics related positions at Pilkington, GEC Marconi, Tyco Electronics and Kymata.



**Eric Markus (Sales Engineer)** is Sales Engineer at Glenair managing the BeNeLux countries. Product portfolio contains all Glenair harsh environment and mission critical interconnect solutions including copper and Fiber Optics based products with applications from Deep Space to Deep Sea. Eric is working as Technical Sales in this industry for over 25 years.

HORIBA

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**HORIBA Scientific**, part of HORIBA group headquartered in Japan, provides an extensive array of instruments, components and customized solutions for a broad range of scientific and industrial applications. The Custom Gratings activity at HORIBA Scientific addresses the needs of the scientific community for very specific, high-end diffraction gratings to accommodate the most challenging applications including high energy lasers, space flight, astronomy, synchrotron and XUV sources. For more than 50 years, HORIBA Scientific (formerly Jobin Yvon) has been playing a leading role in the design, development and manufacture of master and replica diffraction gratings for laboratories throughout the world. Our constant innovation and technical expertise have been demonstrated by the continuous development of both ruled and holographic grating technologies, including the invention of aberration-corrected holographic gratings and ion-etched blazed holographic gratings. HORIBA develops since several decades, through missions in collaboration with prestigious space agencies and system integrators, state of the art of scientific diffraction gratings dedicated to space applications for embedded telescopes or imaging spectrometers. **www.horiba.com**

**Philippe Younès (Gratings & OEM Solutions Director)** is the Gratings & OEM systems division director for HORIBA France with nearly 30 years of product and business development in the areas of optic components and photonic systems. Prior to his current position, he worked as a Sales Director, and then Business development Director at SCHOTT. He holds a MSc in Business Administration and an optical engineer degree.

**William Renard (International Sales Engineer)** graduated from Ecole Supérieure d'Optique (Institut d'Optique Graduate School) in 2009 in Optical and Laser Engineering and then received his PhD in 2012 from Ecole Polytechnique in the field of Fiber Lasers. William spent about 15 years in Laser field in various positions from research engineer at ONERA (The French Aerospace Lab.) to research and development Engineer and Manager in industry. William is within HORIBA France since 2022, and thanks to his specific interest in customer relationship and background in business development and innovation, he is developing the business of Custom Gratings for HORIBA.

**IP Consulting**

**Ignazio Piacentini (Consultant)**, is now retired and has more time for sailing and other interests, though is also busy with few consulting activities. He formerly held the position of Director of Business Development at ficonTEC Service in Achim, Germany in August 2015, after previously heading the Photonics Devices Assembly Business Unit at PI miCos GmbH (Physik Instrumente Group). Before relocating to Germany, he directed ImagingLab Srl in Lodi (Italy), an engineering/consulting company specialized in machine vision and advanced robotics. He also held the position of Business Development Manager Europe for imaging and motion of National Instruments (Austin, TX) from 1999 to 2003. Before joining the machine vision industry in the early '90's, he has spent many years working for the European Commission (Euratom), designing control and data acquisition systems for large-scale thermonuclear fusion experimental projects, including a long spell at the JET Joint Undertaking (Culham Labs, UK). Ignazio has a B.Sc. in Nuclear Engineering (Milan, Italy, 1975) and a M.Sc. degree in Digital Systems and Instrumentation (Polytechnic of Central London, UK, 1987).

iXblue

MEMBER of EPIC

**iXblue** helps photonics engineers all around the world to get the most out of the light by providing high performance, innovative and reliable photonic solutions for high-speed communications, fibers-based sensors, space, science, medical, and quantum technologies. From the design to the manufacturing, iXblue masters the complete production chain of specialty fibers, Bragg gratings, high speed modulation solutions and micro-optic assemblies. iXblue can also provide solutions in all fields of quantum technologies, with a portfolio including quantum gravity sensors, atomic clocks, high-precision frequency transfer equipment and turn-key laser systems. **www.ixblue.com**

**Clément Guyot (Space Products Product Line Manager)** has 10 years of experience in integrated photonics on lithium niobate. He received a PhD in photonics in FEMTO-ST laboratory of the University of Franche-Comté in Besançon, France in 2015. He started to work in iXblue as an optical engineer in iXblue photonics and developed electro-optical modulators. He became project manager for space application in 2019 and managed the design and manufacturing of a space-grade optical transceiver. He is now product line manager of space-grade modulation solutions of iXblue Photonics.

**Hervé Gouraud (Photonics Business Unit Sales Director)** has a PhD, Optoelectronic - Optic and fiber optic - Microwave and Hyper-Frequencies from the University of Limoges, France. Hervé has a strong technical background and sales experience in the LiNbO3 modulation solution and fiber optics. He accompanied customers to key projects related to high end application related to the communication, the space, and the fiber lasers markets.

**Jena-Optronik** has been founded 30 years ago and has a much longer history as it originated out of the remnants of the former Carl-Zeiss-Jena company. JOP is an independent subsidiary of Airbus, world market leader of star trackers for satellites, a major international supplier for AOCS products, and provider of subsystems and components for Earth observation instruments like ESA's Sentinel series. **www.jena-optronik.de**

**Thomas Kämpfe (LIDAR Systems Engineer)** graduated in physics and obtained a PhD with specialization in micro optics in 2009 from the Friedrich Schiller University Jena, Germany. Since then, he has worked on multiple academic and industrial research projects mainly in the domain of diffractive micro-optical elements, plasmonics and lasers, as researcher at the University of Lyon, France. Now he works at JenaOptronik as systems engineer in the LIDAR group, with a focus on general LIDAR design, scan pattern analysis, optical simulations, and hazard mapping applications.

**LEO Space Photonics** (based in Athens, Greece) is a developer of transceiver solutions for satellite optical communications applications. The company has expertise and an established full custom circuit design flow of analog/mixed signal electronic and photonic integrated circuits. Our business and R&D focus is on new generation, photonics-enabled high-speed inter-satellite connectivity and Very High Throughput Satellite payloads. In these areas we lead two EU funded programmes - H2020-SPACE-ORIONAS (www.space-orionas.eu) and H2020-SPACE-SIPHODIAS (www.space-siphodias.eu) - in which we deliver integrated circuits for new generation laser-com terminals and high-speed intra-satellite optical interconnects. **www.leo-sprd.eu**

**Leontios Stampoulidis (Founder)** has nearly 20 years of product development, R&D and entreprenurial experience in the area of photonic components and systems for optical communications. In the field of space photonics, he has been the principal investigator of a several commercial, ESA and EC-funded projects on the development of prototype-to-protoflight satellite lasercom sub-systems as well as a successful start-up acqusition. In 2018, he has founded LEO Space Photonics, a developer of electronic and photonic transceiver integrated circuits for hi-rel optical interconnect applications. He is leading the company's product development and he is the co-ordinator of two multi-million R&D programmes funded by the European Comission focusing on satellite constellations and very high throughput satellite photonic payloads. He has a PhD in photonic communication systems, ~100 publications in scientific journals/conferences and is the inventor of 3 patents.

Łukasiewicz
Institute of Microelectronics
and Photonics

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**Łukasiewicz – IMiF (Łukasiewicz – Institute of Microelectronics and Photonics)** was founded on 1 October 2020 on the merger of the Łukasiewicz – Institute of Electron Technology and the Łukasiewicz – Institute of Electronic Materials Technology, conducts scientific research and performs developmental work in the fields of micro- and nano-electronics, materials engineering, optoelectronics and nano-photonics, microwave electronics, power electronics, transparent and flexible electronics. The Institute implements and disseminates the results of these works in the economy, being open to cooperation with entrepreneurs. The research at the Institute is organized around technology lines for: optoelectronic subassemblies, silicon subassemblies, wide band gap semiconductor subassemblies, advanced materials and the LTCC technology. These state of the arts lines enable the scientific community to participate in research, and entrepreneurs to develop new solutions. **www.imif.lukasiewicz.gov.pl**

**Kamil Pierściński (Research Group Leader)** received the M.Sc. and engineering degrees in physics from the Warsaw Univers of Technology in 2004 and the Ph.D. degree (with hons.) in semiconductor laser physics from the Institute of Electron Technology, Warsaw in 2009. From 2012 to 2013, he was a Postdoctoral Researcher at École polytechnique fédérale de Lausanne, working on optically and electrically pumped wafer-fused VECSELs. His main research interests include optical spectroscopy of semiconductor materials and devices with his current research on design and electrical, spectral, and thermal characterization of mid-IR QCLs and their applications.

LioniX INTERNATIONAL

MEMBER of EPIC

**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**

**Henk Leeuwis (Vice-President, Strategy and Innovation)** obtained his MSc degree in Electrical Engineering at the University of Twente. He has been active in micro/nano system technology for over 35 years. In January 2002, he became Executive VP at LioniX BV (since 2016 LioniX International BV) and, since 2012, he is Vice-President Strategy and Innovation. He has been and is active in numerous European programs as project leader for RTD projects and as proposal evaluator. He is Honorary Founder of the Dutch Micro/Nano Technology Association MinacNed and is involved in numerous governmental task forces and committees. Henk is active in business development for lab-on-chip technology over the last 25 years including collaborations with biotech, pharma and medical partners. He is one of the initiators in establishing an ecosystem in the area of Personalized Medicine and Companion Diagnostics in the Netherlands.

**Paulus van Dijk (Vice President, Strategy and Innovation)** co-founded SATRAX in 2010 and served as Chief Executive Officer (CEO) with responsibilities for supply chain management, business development and marketing of the integrated microwave photonics products. He worked 11 years at ASML, Veldhoven, The Netherlands, where he was responsible for new business development and product marketing at the Special Applications and 300mm Business Units. He holds an engineering degree and a Ph.D. in Physics from the Technical University Eindhoven (1997) and a Master of Business Marketing (MBM) from TIAS Nimbas School (2002). Paulus is co-author of more than 36 scientific and peer-reviewed articles and holder of 6 patents.

LUMOSCRIBE

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**LUMOSCRIBE** is an innovative SME company established in Cyprus in 2018 that specialising in developing sensors and lasers using optical fibers for sensing and fibre laser applications. Lumoscribe is interested in developing complete end-user sensing solutions and optical devices, such as light sources, spectrometers, and fibre lasers, amongst others. The company has already participated in various national and international research projects with more than a million euros total funding. **www.lumoscribe.com**

**Antreas Theodosiou (Founder)** finished his PhD at the Cyprus University of Technology with a specialization in photonics and optical sensors. He holds an MBA and MSc with a specialization in communication systems. His research includes inscription and development of optical sensors using femtosecond laser systems, waveguides, Bragg gratings, Mach-Zehnders, Fabry-Perot cavities, in polymer, silica, and other novel optical materials, and various applications using optical fibre sensors. He has experience working with demodulation algorithms for complicated Bragg gratings spectrums, and fibre lasers. Recently Antreas was awarded with the Cyprus Research Award – Distinguished Researcher "Physical Sciences & Engineering" 2021 by the Research and Innovation Foundation and the Cyprus government and 2020 SPIE Community Champion.

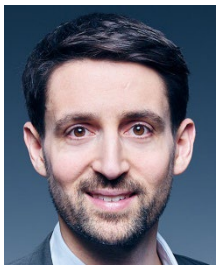
MenloSystems

MEMBER of EPIC

**Menlo Systems** is a leading developer and global supplier of instrumentation for precision metrology on the highest level. Based in Martinsried near Munich, Menlo Systems is known for its Nobel Prize winning optical frequency comb technology. Their main product lines are optical frequency combs, solutions for time and frequency distribution, ultrastable lasers, terahertz systems, and femtosecond lasers. Menlo Systems deliver state-of-the-art products to customers from industry and academia worldwide. To push the limits of the measurable, Menlo Systems work closely with selected customers and develop new solutions for laser-based precision measurements. **www.menlosystems.com**

**Frederik Böhle (Project Manager)** received his PhD in Physics from École Polytechnique and Ms in Physics from Technical University of Munich. He joined Menlo Systems in 2018 and works as Project Manager.

**Menhir Photonics** is a worldwide supplier of ultrafast lasers (picosecond and femtosecond lasers) and related photonics solutions. We focus on industrial quality by emphasizing the reliability and robustness of our products. This allows our ultrafast lasers to be used in all conditions, from laboratory setups to space applications. Thanks to innovative technology and design, the lasers offer extremely low phase noise and timing jitter at record high pulse repetition rates, making them the right choice for numerous applications including timing & synchronization, microwave generation, and applications in telecommunication such as quantum key distribution or photonic analog to digital conversion. **www.menhir-photonics.com**



**Florian Emaury (CEO and Co-Founder)** is CEO and Co-Founder of Menhir Photonics. After graduating in 2010 from the Institute d'Optique Graduate School in Paris (MSc in Photonics/Physics), his career started with engineer experiences in Fianium (UK) and Coherent (CA, USA) before joining ETH Zürich to obtain a PhD in Physics in 2015 in the group of Prof. Ursula Keller. Since then, Florian is devoting to create business opportunities with femtosecond lasers. In May 2018, Florian co-founded Menhir Photonics to offer reliable and turnkey ultrafast lasers to its users.

**MEETOPTICS** is a Specialized Photonics search where engineers, scientists and innovators find and compare components and technologies amongst trusted suppliers. This search, now listing more than 45,000 products, is highly customizable and specialized in dealing with the technical details of products, allowing optical engineers, researchers, technicians and innovators in photonics to quickly find the products they need to build their photonics technology and access any other photonics-based technology and services, while photonics manufacturers can advertise their products and services centrally. MEETOPTICS increases the visibility of highly specialised photonics technology companies and connects them with a direct need of requested technology from customers in the field. **www.meetoptics.com**

**Bárbara Buades (CEO and Co-Founder)** finished a PhD in Photonics (Attoscience: Ultrafast & non-linear optics) at ICFO - The Institute of Photonics Sciences in Spain (2018), MSc in Photonics by Imperial College London UK and background in Physics (BSc+MSc). After her PhD, she co-founded MEETOPTICS together with Dr. James Douglas, to help researchers and engineers in Photonics and Optics find photonics equipment and technologies for their setups. For that MEETOPTICS developed what started as an optics metasearch, something like Skyscanner or KAYAK but for optics. Now with more than 45.000 optics + light sources and expanding to Optomechanics, Fiber Optics and Detection devices, they have helped +55.000 professionals around the world, mainly in Europe and North America.

**Nanovation** is a French start-up, founded in 2001, which develops, produces and commercialises functionalised oxide semiconductor epiwafers and nanostructures. Oxides are remarkable, multifunctional materials offering extraordinary property sets and a huge range of established and emerging applications. In particular, novel oxide epiwafer based devices provide enhanced performance in sensors, displays, solar cells and power electronics along with a plethora of photonic, thermal, magnetic and electronic applications, while oxide nanostructures find applications ranging from anti-reflection coatings to plasmonic molecular sensing and anti-microbial coatings. **www.nanovation.com**

**David Rogers (Director)** received his PhD in Solid State Physics from the University of Glasgow (Scotland) in 1990. His early research career at Philips Research Laboratories (Netherlands), Carnegie Mellon University (US) and Nippon Telephone and Telegraph (Japan) focused on magnetic materials for data storage. David was later Project Manager of a cuprate superconductor start-up company based in Paris. In 2001, he co-founded Nanovation. David is the author/co-author of over 30 patents and 130 publications. He is also an organiser and a regular invited speaker at numerous international conferences. In parallel with developing Nanovation, he has pursued an academic career as a lecturer at the University of St Andrews (UK), an Associate Professor at the University of Technology of Troyes (France) and a visiting Professor at the Indian Institute of Technology (Jodhpur). As well as his role at Nanovation, he is also currently an adjunct Professor at the University of Technology of Sydney.

**Ommatidia LiDAR** specializes in the digitalization of our world. We support the 4th industrial revolution with accurate 3D data of machines, vehicles, their environment, infrastructure and buildings. This information will improve production processes, create new products and services, and allow the next wave of automation. Ommatidia LiDAR builds on proprietary technology that allows faster, more accurate and longer-range 3D imaging than was previously possible. This unique capability results from the company's ability to use innovation to generate value for its customers. This guiding principle, together with a strong focus on quality in its processes and products, results in first-in-class solutions with the potential to transform a wide range of industries. **www.ommatidia-lidar.com**

**Kévin Cognée (Photonics Engineer)** obtained a joint PhD in nanophotonics at the University of Bordeaux (France) and the University of Amsterdam (the Netherlands) under the supervision of Dr. Philippe Lalanne (Institut d'Optique, France) and Dr. Femius Koenderink (AMOLF, the Netherlands) in 2020. He also received a broad and yet thorough education in optics and photonics, ranging from quantum optics to 3D computer vision, as he obtained an engineering degree (equivalent MSc) from the Institut d'Optique in 2015.

**OPTOMAN** designs, develops and manufactures advanced, high accuracy, and repeatability IBS thin film coatings and laser optics since 2017. R&D driven culture forces the OPTOMAN team to constantly improve the performance and reliability of thin film coatings so our partners eventually could enjoy the benefits of lower total cost of ownership. OPTOMAN as your sidekick is always willing and ready to help you with finding optimized solutions (ultra)fast and back you up in critical situations and finally get the job done as was promised. High level development is possible with experienced staff and innovative ion-beam sputtering (IBS) technology. Progressive control and automated process allow the deposition of complex structures of several hundred thin film layers. The advantages of spectral control include features, such as: higher contrast, repeatable performance, and tighter tolerances. In combination with ISO-6 clean room environment, OPTOMAN manufactures outstanding overall quality laser optics. Do not forget that with great laser power comes great responsibility for coaters! **www.optoman.com**

**Dominykas Puzinas (Sales Engineer)** is a space addict, therefore he is the person at OPTOMAN who works with space applications. His genuine interest has reflected in his bachelor thesis where he has investigated details of manufacturing electrodynamic vibration test bench for nanosatellites. Now at OPTOMAN, he found a way to fuse his knowledge about space and photonics and lead the space applications segment to the moon (at least) by initiating application-optimized optical coatings development. For example, membrane mirrors to fight distorted beams in active deformable adaptive set-ups in astronomy or communication precision between devices.

**Optosigma** is a leading global manufacturer of Optical Systems, Optical Assemblies, Optical Coatings, Opto-Mechanics, Manual and Motion Control Stages, and a variety of complimentary Photonics products. With over 19,000 standard items, we provide a wide range of high-quality products, and we also manufacture custom solutions to support various industries including Life Sciences, Bio-Medical, Semiconductor, Displays, Research, Telecommunications, Aerospace and Defense. “OptoSigma” was born in 1995 as a California Corporation as a subsidiary of SigmaKoki Co., Ltd., Tokyo Japan. SigmaKoki was born in Japan in 1977. Today, OptoSigma is our global brand name with affiliates in France, Germany, Singapore and China. Together we are known as, “The SigmaKoki Group” and we have over 45-years of experience and counting. Our motto follows three important words, Appreciation, Challenge, and Creation. Through creation, we follow a Japanese word, “Monozukuri” that can be defined as the art, science, and craft of manufacturing. Through “Monozukuri”, we employ the highest quality standards for craftsmanship and continue to seek ways to improve our process, efficiency, and methods, all for the benefit of our highest priority, YOU, “Our Customers”. We strive and challenge ourselves to create solutions that enable new technologies for a better tomorrow and a brighter future. On this page, you will be able to gain a deeper look into our history, our values, and our capabilities. **www.optosigma.com**

**Guy Ear (Chairman, President and CEO)** has 10 years of several sales and marketing management positions in airlines, tourism and luxury hospitalities in France, UK and the United-States, prior to deciding in 2005 to take a new challenge in the Photonics industry by taking a Sales & Marketing Director for Asia Pacific at a UV light-source manufacturer for Lithography, Mask Aligner equipment in Japan. With his strong self-taught abilities and capability in speaking 5 languages in the Asian region, Guy has built up an extensive experience and a human network. He founded Etendue Mejiro KK (Japan) in 2006, a company specialized in design and manufacturing high performance scan lens for semi-conductor and digital displays industry, which was sold in 2009. Guy joined SIGMAKOKI Group (OptoSigma Parent company) as the Head of the International Sales Division to expand the international presence of the SIGMAKOKI Group in Asia and recently by establishing a new subsidiary in Europe in 2014.

**Photon Technology (PHOTEC)** was established in 2016 by senior researchers of Shanghai Institute of Microsystem and Information Technology. The company business is focused on the industrialization and distribution of Superconducting Nanowire Single Photon Detectors (SNSPD) and their peripheral technologies. As the core product of PHOTEC, SNSPD has reached the world-class performance index, has been widely applied in quantum information, quantum photonics, quantum key distribution, remote sensing and so on. **www.cnphotec.com**

**Daniela Salvoni (Sales Manager)** is the Sales Manager at Photon Technology. During the PhD in Physics at the University of Naples Federico II, she worked on the fabrication and characterization of Superconducting Nanowires Single Photon Detectors (SNSPD) focusing on different materials and geometries to optimize the detection in the IR. She specialized on Lidar applications, collaborating with the company Advanced Lidar Applications and the Beijing Institute of Telemetry (BRIT). After one year of post doc, she joined the company Photon Technology, providing SNSPDs systems with excellent performances.

**PHIX** offers assembly services and contract manufacturing for Photonic Integrated Circuits (PICs) and MEMS. We build optoelectronic modules based on all major PIC technology platforms, such as Indium Phosphide, Silicon Photonics, Silicon Nitride, and Planar Lightwave Circuit. We specialize in chip-to-chip hybrid integration, coupling to fiber arrays, and interfacing of DC and RF electrical signals. By offering our knowledge already at the chip design stage, we ensure ease of scale-up for volume manufacturing. PHIX provides a one-stop-shop for PIC and MEMS assembly, from design to volume production. We have a state-of-the-art production facility located in Enschede, the Netherlands, supporting the global industrial development of PIC and MEMS enabled modules. **www.phix.com**

**Erwin Vergeest (Business Developer)** has more than 25 years of experience in the creation and management of innovative optical solutions, of which 20+ years at Silicon Valley start-up companies and is holder of 8 Patents. His professional photonics journey started in 1992, after he graduated in Photonics Engineering in the Netherlands by joining the AMP/Tyco Fiber Optics Division. There he developed optical interconnect solutions like the “LightRay MPX” multi-fiber interconnect system and laser cleaving. In 2000, he relocated to California where he held several positions in engineering and product line management at companies like Tsunami Optics, Novera Optics, Ignis Optics, Bookham, New Focus, Ledengin, Finisar and Luminus before returning to the Netherlands. In October 2021, Erwin accepted a position as Business Developer at PHIX Photonics Assembly where he is responsible for the development of the photonics packaging business.

**PI (Physik Instrumente)** with headquarters in Karlsruhe, Germany, in the past five decades has become the leading manufacturer of nanopositioning systems with accuracies in the nanometer range. With four company sites in Germany and fifteen sales and service offices abroad, the privately managed company operates globally. Over 1500 highly qualified employees around the world enable the PI Group to meet almost any requirement in the field of innovative precision positioning technology. All key technologies are developed in-house. This allows the company to control every step of the process, from design right down to shipment: precision mechanics and electronics as well as position sensors. The required piezoceramic elements are manufactured by its subsidiary PI Ceramic in Lederhose, Germany, one of the global leaders for piezo actuator and sensor products. PI miCos GmbH in Eschbach near Freiburg, Germany, is a specialist for positioning systems for ultrahigh vacuum applications as well as parallel-kinematic positioning systems with six degrees of freedom and custommade designs. **www.pi.ws**

**Daniel Achenbach (Head of Segment Marketing Photonics)** has joined PI in Karlsruhe in September 2022. At PI he is now taking care of Precision Positioning Solutions for Photonics applications such as Free Space Optical Communication, Silicon Photonics, and Quantum Photonics. In his previous roles, he has worked as Product Manager for Coherent LaserSystems in Luebeck (2016-2022) and Spectra-Physics in Austria (2007-2016). At Coherent and Spectra-Physics, Daniel managed mode-locked pico- and femtosecond lasers for industrial OEM applications. He studied Physics at University of Bayreuth and graduated with a diploma degree in 2007.

**RANOVUS** develops and manufactures advanced photonics interconnect solutions to support the next generation of AI/ML workloads in data centers and communication networks. Our team has extensive experience in product development and commercialization of optoelectronic subsystems for the information technology industry. RANOVUS' current disruptive portfolio includes Multi-Wavelength Quantum Dot Laser technology and advanced digital and silicon photonics integrated circuit technologies. RANOVUS' Odin™ platform is the enabling technology for the lowest power dissipation, size, and cost for the next generation of optical interconnect solutions for a new data center architecture optimized for AI/ML workloads. **www.ranovus.com**

**Georg Roell (CTO)** is the Chief Technology Officer at RANOVUS. Prior to joining RANOVUS, Georg was a Distinguished Engineer and Senior Director of Operations at Cisco Systems. Georg was co-founder of CoreOptics and held positions as CTO and VP of Operations until its acquisition by Cisco. Before co-founding CoreOptics, Georg was Director of Lightwave Technology within the Optical Networking Group of Lucent Technologies at Holmdel, NJ, USA. Prior to this, he was R&D director for high-speed and high-capacity lightwave systems at Lucent in Germany. Georg received the Bell Labs Fellowship for his outstanding contribution to high-speed optical transmission systems. He earned an Ingenieur graduate degree in telecommunications from the Ohm Polytechnikum in Nuremberg, Germany.

**Rivada Space Networks**, founded in 2022 is a disruptive new European company set to establish and operate the first truly global low latency point-to-point connectivity network of LEO (Low-Earth-Orbit) satellites. By interconnecting its satellites with lasers, Rivada Space Networks will operate like an optical backbone in space and will provide Enterprise Service Provider and B2B/B2G customers with the ability to securely connect any two points on the globe with ultra-low latency and high bandwidth. This will also make it possible to bring high-class connectivity services to remote and underserved areas where no backhaul is currently available. The constellation of 600 LEO communications satellites will represent a fundamental change in the availability of secure, global, end-to-end enterprise-grade connectivity for Telecom, Enterprise, Maritime, Energy, Government Services and further vertical markets. **www.rivada.com**

**Thomas Laurent (Business Development Director)** is a seasoned expert in photonics, quantum technologies and space with more than 20 years of experience in the industry. He was co-founder and co-director of eagleyard Photonics, a Berlin-based manufacturer of laser diodes, which is also very active in various space activities. With his experience from participation in traditional space missions such as GAIA, CATS, CAL and EXO Mars, he moved into that area of new space dealing with satellite communication services. At Rivada Space Networks, he is responsible for business development in vertical markets that require ultrafast connectivity, such as mining, maritime, autonomous driving and GNSS. He holds a PhD in physical chemistry.

**SCHOTT** is a leading international technology group in the areas of specialty glass, glass-ceramics and related high-tech materials. With over 135 years of experience, the company is an innovative partner to many industries, including the home appliance, pharma, electronics, optics, life sciences, automotive and aviation industries. SCHOTT has a global presence with production sites and sales offices in 34 countries. In fiscal year 2020/2021, the Group generated sales of EUR 2.5 billion with its 17,000 employees. SCHOTT AG has its headquarters in Mainz (Germany) and is solely owned by the Carl Zeiss Foundation. This is one of the oldest private and largest science-promoting foundations in Germany. As a foundation company, SCHOTT assumes special responsibility for its employees, society and the environment. **www.schott.com**

**Daniel Vasseur (Vice President Global Sales EMEA - LATAM)** is Vice President Global Sales for Schott group in EMEA - LATAM and Managing Director of Schott in France. He has an optical engineer background and a professional expertise in Space and Defense on products related to Optics, Technical Glass and Lasers. Thanks to his experience in optical manufacturing processes and coatings during the last 25 years to provide solutions on integrated special glass or optical components.

**SEDI-ATI Fibres Optiques**, bringing light to your customized, complex or extreme environment is our challenge! Since 1951, our mission is to design and build turn-key solutions to enable our customers to bring light in any environment, whatever their constraints are! SEDI-ATI offers achromatic multimode couplers, multimode wavelength division multiplexers, fiber optic hermetic feedthroughs, bundles & arrays, and medical probes. Our fiber assemblies are used in applications in extremely aggressive and hazardous environments such as those found in the oil and gas industry, in nuclear plants, in electric utilities, in the military and aerospace, or in the medical field. The applications of our products and solutions are as diverse as optical sensors, opto-pyrotechnics, cryogenics, or high-power lasers that can cut and weld steel. **www.sedi-ati.com**

**Axel Guédé (Technical Sales Engineer)** joined SEDI-ATI in September 2021, as a Technical Sales Engineer. Currently as an international corporate volunteer, Axel participated in the opening of our local sales office in Amsterdam and is in charge of sales development in Northern Europe. As an engineer, graduated from ENSSAT (Ecole Nationale Supérieure des Sciences Appliquées et de Technologies), Axel wishes to develop his commercial skills while associating his scientific background in the field of photonics, which is totally in line with the development of SEDI-ATI's export activities. This double competence is essential in the support of the customers addressed by SEDI-ATI.

**SINTEF** is one of Europe's largest independent research organisations. It is a broad, multidisciplinary research organisation with international top-level expertise in the fields of technology, the natural sciences, medicine and the social sciences. It conducts contract R&D as a partner for the private and public sectors, and is one of the largest contract research institutions in Europe. **www.sintef.no**

**Tor Dokken (Chief Scientist and Research Manager)** is Chief Scientist and Research Manager in the Department of Mathematics and Cybernetics in SINTEF Digital research institute in Oslo, Norway. He is the coordinator of the I4MS-project www.Change2Twin.eu targeting Digital Twins for Manufacturing, and is lead scientist from SINTEF Digital in the I4MS project www.Pulsate.eu targeting advanced laser based and additive manufacturing. His focus is on the digital and mathematical aspects of manufacturing with expertise in 3D shape representation both for traditional CAD and Additive Manufacturing with a strong interest in digital twins, their role in the product lifecycle, and the interplay of digital twins with material characterization and simulation.

**STRATOSYST** is a Czech company developing HAPS – High Altitude Pseudo-satellites. As HAPS operator, we will provide services in the area of Earth observation, navigation, telecommunication, testing and defense. **www.stratosyst.com**

**Jiří Pavlík (Founder & CEO)** is an Power Systems Engineer, entrepreneur, and inventor. In 2017, he set-up Stratosyst as a platform for development of High Altitude Pseudo Satellite with its original purpose of Astronomy observation from Stratosphere. Thanks to Stratosyst he won, with his team, 2018 Galileo Masters Award and is now actively working on prototype development for first stratospheric flight.

**Space Power** is an in-orbit energy supplier for satellites and spacecraft for increased performance and sustainability. Providing power in space enables more intensive and useful payloads, previously impossible missions in the eclipse and permanent shadows and supplementing ageing power systems and batteries for life extension. Customers can benefit from less complex power trains to improve mission success, perform longer missions and reduce their demand on raw materials and launch volume and fuel. **www.space-pwr.com**

**Keval Dattani (Founder & CEO)** is a chartered engineer from Imperial College (Nuclear and Mechanical Engineering MEng) specialising in technology R&D and manufacturing, starting his career in nuclear reactor design and manufacture at Rolls-Royce. He has since worked on the STEP fusion reactor at UKAEA before founding Space Power Ltd.

**Tecnottica Consonni** is an optical manufacturing company being on the market since 1957 and specialized in the manufacturing of custom optical components (in glass and plastic materials) and in custom finished optical systems. The range of products offered to our customers is one of the most varied and complex of the optical and photonic markets: it involves applications in the field of machine vision, biophotonics, optoelectronics, defense and security, aerospace and lighting. Within our product portfolio we produce spherical and aspherical lenses, prisms, optical filters, optical mirrors, light guides, ball lenses with dimensions ranging from 2 mm up to 400 mm. Tecnottica offers also a wide range of complementary services, like the application of anti-reflective, high-reflective and dichroic coatings, thermal and chemical tempering of glassy substrates, engineering and modelling of imaging and lighting optical systems, construction of mechanical elements for the housing of the optics as well as assembly, testing and final certification of single and finished optical systems. **www.tecnotticaconsonni.it**

**Francesca Brambilla (Technical Manager)** joined Tecnottica team in 2020, as Junior Technical Manager, and in May 2022, as Technical Manager. She completed her Bachelor Degree in Physics at University of Milan Bicocca in 2020, where she had the opportunity to further her studies in Optics. Currently she focuses on Metrology, Certifications and Feasibility study of High Precision Optics projects for Aerospace and Astronomical field.

**TESAT** has developed in-depth expertise in manufacturing of payload equipment for communication satellites and has established itself as a clear European market leader. On its 60,000m² premises in Backnang, Germany, about 1,100 employees develop, assemble, integrate, and test systems and equipment for telecommunication via satellite. The product range spans from smallest spacespecific components to modules, entire assemblies or payloads. As the world's only provider and technology leader of in-orbit-verified optical communication terminals (OCTs) for data transmission via laser, TESAT has a focus on commercial and institutional space programs. **www.tesat.de**

**Eberhard Moess (Senior Expert)** has master degree (MSc, FH) in Engineering Physics Technology from Heilbronn University of Applied Science. Since 1979, he is technical project manager at AEG-Telefunken, ANT Nachrichtentechnik and Bosch Telecom in several European (EU, ESA-ESTEC) and German BMBF (VDI) projects. His main activities are optoelectronic devices for telecom application, RF components, module and packaging technology, RF and optical microsystem components for automotive and telecom market. He has more than 35 patents are originated in the past. Since 2001, he is responsible for the development and production of RF and optical modules for satellite applications at Tesat-Spacecom.

**TNO** is an independent Dutch organisation for applied scientific research with approximately 5400 employees. Research themes include: Healthy Living, Industrial Innovation, Defence/Safety/Security, Energy, Transport and Mobility, Built Environment, Information Society. **www.tno.nl**

**Fabrizio Silvestri (Optical Designer – Architect)** received the Ph.D. degree in Electromagnetics from Eindhoven University of Technology, the Netherlands, in 2017, the M.Sc. degree (cum laude) in Electrical Engineering from University of Genoa, Italy, in 2013 and the B.Sc. degree in Electrical Engineering (cum laude) from Polytechnic University of Marche, Italy, in 2010. Since 2017, he is an optical designer/architect within the Optics Department of TNO. His main research interests are in design, integration and testing of optical systems for satellite optical communication systems, LiDAR systems, metrology systems.

**VIAVI** has a 90+ year history of technical innovations that have evolved to keep pace and address our customer's most pressing business issues. The Optical Security and Performance Products (OSP) Division is a leader in high performance thin film optical coatings and light shaping optics, providing light management solutions to anti-counterfeiting, consumer electronics, automotive, defense and instrumentation markets. **www.viavisolutions.com**

**Najib Hatoum (Account Manager)** is an Account Manager at VIAVI. Najib advises customers on OSP technologies and supports them from prototype to production.

**YellowScan** designs, develops, and builds UAV LiDAR solutions to exceed the expectations of professionals that require performance, robustness, and accuracy. Our complete hardware and software solutions are easy to use. Data collection tools come with an unparalleled level of training and support from our experts. Founded in 2012, YellowScan has customers around the world, and are used for surveying in the forestry, environmental research, archaeology, industrial inspection, civil engineering, and mining sectors. Based in the South of France, we have sales and support offices around the globe. **www.yellowscan-lidar.com**

**Tristan Allouis (CTO)** is CTO and co-founder of YellowScan. His background are electronic and computer science engineering and PhD in environmental science. His core expertise is lidar technologies applied to mapping application. He is leading the development of the YellowScan company for 10 years.

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