EPIC Meeting on New Space at European Space Agency

Noordwijk, The Netherlands
12–13 September 2019
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EPIC Meeting on New Space

The meeting will bring together a set of companies to cover some of the key priorities for the “New Space” roadmap. The purpose of the so called “New Space” trend, is to bring to the Space market mature or established technologies that either compete with or complement existing commercial space services. The ESA priorities to be covered at the EPIC meeting are: new solutions for miniaturized and low cost LIDAR (adapting solutions from automotive market), RADAR (including microwave photonics); new concepts for optical network architectures in space (such as OneWeb); solutions for ultra-low power highly efficient and miniaturized datacom transceivers (using Photonic Integrated Circuits, plasmonics, …); the use of novel cameras and sensors for remote gas analysis as well as environmental monitoring (FTIR, SERS, low light cameras, hyperspectral imaging, …); and last but not least, new concepts for atomic clocks for both timing and navigation, as well as new quantum technologies and applications (quantum teleportation, quantum satellites, QKD, ghost imaging, …).

12 September 2019, Thursday

11:30 Departure by the optional bus transfer from the Hotel NH NOORDWIJK CONFERENCE CENTRE LEEUWENHORST to European Space Agency (ESA)
Address of the Hotel: Langelaan 3, 2211 XT Noordwijkerhout, The Netherlands

12:00 – 13:00 Registration & Lunch @ ESA
Address: Erasmus building, Keplerlaan 1, 2201 AZ, Noordwijk, The Netherlands

13:00 – 13:05 Welcoming words by Jose Pozo, CTO, EPIC – European Photonics Industry Consortium

13:05 – 13:15 Welcoming words by Franco Ongaro, Director, European Space Agency

SESSION 1 – SETTING UP THE SCENE

13:15 – 13:45 KEYNOTE: How to mitigate atmospheric turbulence without adaptive optics
Jean-François Morizur, CEO, Cailabs (FRANCE)

13:45 – 14:00 Space activities, from photonic components to whole equipments qualification
Jerome Hauden, R&D Team Manager, iXblue (FRANCE)

14:00 – 14:15 Photonics, COTS and new space: future challenges for radiation qualification
Jochen Kuhnhenn, Head of Nuclear Effects Unit, Fraunhofer INT (GERMANY)

14:15 – 14:30 Reliability considerations on photonics parts for new space applications
Juan Barbero, Technical Manager, ALTER Technology (SPAIN)

14:30 – 14:45 Transforming space optics by integrating innovative monolithic optical systems
Itai Vishnia, CEO, PLX (USA)

14:45 – 15:30 Coffee break

SESSION 2 – LIDAR, LADAR AND RADAR FOR SPACE

15:30 – 16:00 KEYNOTE: Aeolus – 1st wind lidar in space
Thomas Kanitz, Payload Performance Engineer, European Space Agency (THE NETHERLANDS)

16:00 – 16:30 KEYNOTE: Solid-state imaging LIDAR for close proximity navigation in the new generation of medium size satellites
Jordi Riu Gras, CEO, Beamagine (SPAIN)

16:30 – 16:45 LIDAR technology: from automotive to new space
Pierre Chazan, Regional Sales Manager, First Sensor (FRANCE)

16:45 – 17:00 From LIDAR to optical atomic clocks: building blocks for optical frequency references in space
Hanjo Schaefer, Project Manager, Spacetech (GERMANY)
17:00 – 17:45  Coffee break

SESSION 3 – FREE SPACE OPTICAL NETWORKS: ULTRA-LOW POWER HIGH EFFICIENT TRANCEIVERS AND FREE SPACE COMMS

17:45 – 18:15  KEYNOTE: Optical communications: ESAs plans for SPACE19+
Harald Hauschildt, ARTES ScyLight Programme Manager, European Space Agency
(THE NETHERLANDS)

18:15 – 18:30  Sensitive optical receiver for space communication
Peter Andrekson, Professor, Chalmers University (SWEDEN)

18:30 – 18:45  Space grade optoelectronic components for free-space and fibre-optic RF and digital datalinks
Ronald Logan, VP & CTO, Glenair (USA)

18:45 – 19:15  KEYNOTE: Next steps in optical communication in space
Ludovic Blarre, Future Telecom Systems – Optical Communications Manager, Airbus (FRANCE)

19:15 – 19:30  Photonic integrated circuits for optical communication in space
Michael Geiselmann, Co-Founder & Managing Director, Ligentec (SWITZERLAND)

19:40  Departure by the bus transfer from ESA to the dinner place

20:00 – 22:45  Dinner @ Beachpavilion “de Zeemeeuw”
Address: Koningin Wilhelmina boulevard 108, 2202 GW Noordwijk, The Netherlands

22:50  Departure by the bus transfer from the dinner place to the hotel – NH NOORDWIJK CONFERENCE CENTRE LEEUWENHORST

13 September 2019, Friday

07:30 – 08:00  Check out of the Hotel

08:00  Departure by the bus transfer from the hotel NH NOORDWIJK CONFERENCE CENTRE LEEUWENHORST – to ESA (departure meeting point: hotel lobby)

08:30 – 08:55  Morning coffee @ ESA

08:55 – 09:00  Recap and introduction to the 2nd day – Jose Pozo, CTO, EPIC

SESSION 4 – LOW LIGHT CAMERAS AND SENSORS FOR GAS ANALYSIS AND ENVIRONMENTAL MONITORING

09:00 – 09:15  Multispectral arrays (UV – LWIR) for compact optical space instruments
David Harrison, Business Development Manager, Materion Precision Optics (USA)

09:15 – 09:30  QWIP and T2SL infrared detectors keep all their promises
Eric Costard, CTO, IRnova (SWEDEN)

09:30 – 09:45  SWIR imaging latest developments, a focus on space applications
Simon Ferré, SWIR Sensor Engineer, New Imaging Technologies (FRANCE)

09:45 – 10:00  Compact solid state sensors for UV space astronomy
David J.Rogers, Director, Nanovation (FRANCE)

10:00 – 10:15  Distance measurements beyond the coherence length of lasers
Yves Salvadé, Professor, Haute Ecole ARC Ingénierie (SWITZERLAND)

10:15 – 10:30  Security of space assets by monitoring of space debris with lasers
Gerd Wagner, Physicist, German Aerospace Center (DLR) (GERMANY)
10:30 – 10:45  Hyperspectral imaging for Earth Observation: from microsatellites to constellation of nanosatellites
Eneka Idiart-Barsoum, CEO, ENEKA Consulting (FRANCE)

10:45 – 11:30  Coffee break

SESSION 5 – QUANTUM TECHNOLOGIES, ATOMIC CLOCKS AND ATOM INTERFEROMETRY

11:30 – 12:00  KEYNOTE: Future payloads for space- exploiting new possibilities with integrated photonics
Eamon Murphy, Engineering Directorate, European Space Agency (THE NETHERLANDS)

12:00 – 12:15  The challenges in developing lasers for quantum applications
Mark Mackenzie, Sr. R&D Engineer, UniKLasers (UNITED KINGDOM)

12:15 – 11:30  Lasers for quantum optics: from laboratory into real life – and into space?
Thomas Renner, CSO/Member of Board, TOPTICA Photonics (GERMANY)

12:30 – 12:45  Packaging for space & quantum technologies
Mark Day, Business Development Manager – Quantum Technologies, Optocap (UNITED KINGDOM)

12:45 – 13:00  Quantum information processing with PICs
Jelmer Renema, CTO, QuiX (THE NETHERLANDS)

13:00 – 14:00  Lunch

SESSION 6 – INTEGRATED PHOTONICS INNOVATIONS MAKING THEIR WAY TO SPACE

14:00 – 14:15  PhotonDelta the integrated photonics ecosystem & integrated modules in space
Ewit Roos, CEO, PhotonDelta (THE NETHERLANDS)

14:15 – 14:30  Novel sources and systems for space
John-Mark Hopkins, Deputy Head of Centre, Fraunhofer UK (UNITED KINGDOM)

14:30 – 14:45  InPulse pilot line for indium phosphide photonic integration – opportunities for aerospace
Martijn Heck, Associate Professor, Aarhus University (DENMARK)

14:45 – 15:00  Integrated planar waveguides for high speed data communication and sensing in space applications
Felix Betschon, CEO, vario-optics (SWITZERLAND)

15:00 – 15:15  Maturity of automated assembly and testing of PICs enables solutions for LiDAR, transceivers and RF photonics in aerospace
Ignazio Piacentini, Director Business Development, ficonTEC (GERMANY)

15:15 – 15:30  Electronics and optoelectronic devices through advanced materials
Marco Moraja, Business Manager, SAES Getters (ITALY)

15:30 – 15:45  InP components for communication and sensing in space
Pascal Rustige, Research Associate, Fraunhofer HHI (GERMANY)

15:45 – 16:00  All-in-glass packaging for VCSELs and other optical systems in harsh environments
Ville Hevonkorpi, Managing Director, SCHOTT Primoceler (FINLAND)

16:10  End of the meeting

16:15 – 17:15  Tour of ESA

17:20  End & the optional bus transfer from ESA to Schiphol airport

CONTACTS

Neringa Norbutaite, Events Manager, mobile: +370 624 389 91
Jose Pozo, CTO, EPIC, mobile: +31 626 97 83 12
<table>
<thead>
<tr>
<th>Name</th>
<th>Job Title</th>
<th>Company</th>
<th>Country</th>
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<tbody>
<tr>
<td>Alessandra Croce</td>
<td>Sr. Optical Engineer</td>
<td>Zemax</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Alexandra Henniger-Ludwig</td>
<td>Head of Team Active Optics</td>
<td>Rosenberger Hochfrequenztechnik</td>
<td>Germany</td>
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<tr>
<td>Ana Gonzalez</td>
<td>R&amp;D Manager</td>
<td>EPIC</td>
<td>Spain</td>
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<tr>
<td>Andre Richter</td>
<td>General Manager</td>
<td>VPIphotonics</td>
<td>Germany</td>
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<tr>
<td>Andreas Stern</td>
<td>EMEA Director of Sales</td>
<td>Luna Innovations</td>
<td>Germany</td>
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<tr>
<td>Auri Ripoll</td>
<td>Marketing Manager</td>
<td>EPIC</td>
<td>Spain</td>
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<td>Carlos Lee</td>
<td>Director General</td>
<td>EPIC</td>
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<td>Christophe Weisse</td>
<td>Sales Engineer</td>
<td>Zemax</td>
<td>United Kingdom</td>
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<td>Dan Negrea</td>
<td>SVP New Technologies</td>
<td>AEMteC</td>
<td>Germany</td>
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<td>David Rogers</td>
<td>Director</td>
<td>Nanovation</td>
<td>France</td>
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<td>David Mallon</td>
<td>Sr. Principal Software Engineer</td>
<td>Cadence Design Systems</td>
<td>United Kingdom</td>
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<td>David Harrison</td>
<td>Business Development Manager</td>
<td>Materion Precision Optics</td>
<td>USA</td>
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<td>Davinder Basuta</td>
<td>Business Development Manager</td>
<td>Glenair</td>
<td>United Kingdom</td>
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<td>Diarmuid Byrne</td>
<td>Director Engineering R&amp;D</td>
<td>Eblana Photonics</td>
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<td>Domenico Tulli</td>
<td>CTO</td>
<td>Quaside Technologies</td>
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<td>Eamon Murphy</td>
<td>Engineering Directorate</td>
<td>European Space Agency</td>
<td>The Netherlands</td>
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<td>Eduardo Margallo</td>
<td>CEO</td>
<td>Mouro Labs</td>
<td>Spain</td>
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<tr>
<td>Elena Beletkaia</td>
<td>Project Leader</td>
<td>EPIC</td>
<td>The Netherlands</td>
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<td>Emmanuel Larique</td>
<td>Project Manager</td>
<td>LYNRED</td>
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<td>Eneka Idiart-Barsoum</td>
<td>CEO</td>
<td>ENEKA Consulting</td>
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<td>Enzo Giovanni Nava</td>
<td>CTO</td>
<td>Bright Aerospace</td>
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<td>Eric Costard</td>
<td>CTO</td>
<td>IRnova</td>
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<td>Evelien Huijs</td>
<td>Sales Engineer</td>
<td>Ocean Insight</td>
<td>The Netherlands</td>
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<td>Ewit Roos</td>
<td>CEO</td>
<td>PhotonDelta</td>
<td>The Netherlands</td>
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<td>Fatemeh Jessen-Hansen</td>
<td>Optical Engineer</td>
<td>Space Inventor</td>
<td>Denmark</td>
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<td>Felix Betschon</td>
<td>CEO</td>
<td>vario-optics</td>
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<td>Franco Ongaro</td>
<td>Director</td>
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<td>Frank Lison</td>
<td>Managing Director</td>
<td>TOPTICA</td>
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<td>Frederic van Dijk</td>
<td>Research Engineer</td>
<td>III-V Lab</td>
<td>France</td>
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<tr>
<td>Frederic Taugwalder</td>
<td>Business Development Manager</td>
<td>Diamond</td>
<td>Switzerland</td>
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<td>Gerd Wagner</td>
<td>Physicist</td>
<td>German Aerospace Center</td>
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<td>Grégory Pandraud</td>
<td>Founder</td>
<td>Mauro Labs</td>
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<tr>
<td>Gunther Roelkens</td>
<td>Professor</td>
<td>UGent-imec</td>
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<td>Guy Ear</td>
<td>President &amp; CEO</td>
<td>OptoSigma</td>
<td>France</td>
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<td>Hakimeh Mohammadhosseini</td>
<td>Microwave Photonic Engineer</td>
<td>Antwerp Space</td>
<td>Belgium</td>
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<td>Hanjo Schaefer</td>
<td>Project Manager</td>
<td>Spacetechn</td>
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<td>Harald Hauschildt</td>
<td>ARTES ScyLight Programme Manager</td>
<td>European Space Agency</td>
<td>The Netherlands</td>
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<td>Iain McKenzie</td>
<td>Sr. Engineer</td>
<td>European Space Agency</td>
<td>The Netherlands</td>
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<td>Ignazio McKenzie</td>
<td>Director Business Development</td>
<td>ficonTEC</td>
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<td>Itai Vishnia</td>
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<td>Jan Vermeiren</td>
<td>Business Development Manager</td>
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<td>Jean Sauvage</td>
<td>Business Engineer</td>
<td>GLOphotonicics</td>
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<td>Jean-François Morizur</td>
<td>CEO</td>
<td>Callabs</td>
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<td>Jean-Herve Lecat</td>
<td>Business Development Manager</td>
<td>Lambda-X</td>
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<td>Jelmer Renema</td>
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<td>Jerome</td>
<td>R&amp;D Team Manager</td>
<td>iXblue</td>
<td>France</td>
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<tr>
<td>Jochen</td>
<td>Head of Nuclear Effects Unit</td>
<td>Fraunhofer INT</td>
<td>Germany</td>
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<tr>
<td>John</td>
<td>CEO</td>
<td>Southern Photonics</td>
<td>New Zealand</td>
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<tr>
<td>John</td>
<td>Business Innovation Manager</td>
<td>Helia Photonics</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>John-Mark</td>
<td>Deputy Head of Centre</td>
<td>Fraunhofer UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Jonathan</td>
<td>Director</td>
<td>Critical Distance</td>
<td>The Netherlands</td>
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<td>Jordi</td>
<td>CEO</td>
<td>Beamagine</td>
<td>Spain</td>
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<tr>
<td>Jörg</td>
<td>CEO</td>
<td>Crystalline Mirror Solutions</td>
<td>Austria</td>
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<tr>
<td>Jose</td>
<td>CTO</td>
<td>EPIC</td>
<td>The Netherlands</td>
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<td>Juan</td>
<td>Technical Manager</td>
<td>ALTER Technology</td>
<td>Spain</td>
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<tr>
<td>Katarzyna</td>
<td>Sr. Photonics Engineer</td>
<td>Airbus Defence and Space</td>
<td>United Kingdom</td>
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<tr>
<td>Katelin</td>
<td>R&amp;D Engineer</td>
<td>Eblna Photonics</td>
<td>Ireland</td>
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<tr>
<td>Ludovic</td>
<td>Optical Communication Manager</td>
<td>Airbus</td>
<td>France</td>
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<tr>
<td>Ludovic</td>
<td>Sales Manager</td>
<td>AEMtec</td>
<td>Germany</td>
</tr>
<tr>
<td>Luis Jose</td>
<td>Optics Payload and Operation Specialist</td>
<td>Aistech Space</td>
<td>Spain</td>
</tr>
<tr>
<td>Marc</td>
<td>Postdoc</td>
<td>ETH Zürich</td>
<td>Switzerland</td>
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<tr>
<td>Marco</td>
<td>MEMS Business Manager</td>
<td>Saes Getters</td>
<td>Italy</td>
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<tr>
<td>Marek</td>
<td>Managing Partner</td>
<td>VIGO Ventures</td>
<td>Poland</td>
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<td>Mark</td>
<td>Business Development Manager</td>
<td>Optocap</td>
<td>United Kingdom</td>
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<td>Mark</td>
<td>Sr. R&amp;D Engineer</td>
<td>UniLasers</td>
<td>United Kingdom</td>
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<tr>
<td>Martijn</td>
<td>Associate Professor</td>
<td>Aarhus University</td>
<td>Denmark</td>
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<td>Mauro</td>
<td>Sales Engineer</td>
<td>OptoSigma</td>
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<td>Michael</td>
<td>Co-Founder &amp; Managing Director</td>
<td>Ligentec</td>
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<td>Neringa</td>
<td>Events Manager</td>
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<td>Nicolas</td>
<td>Business Director</td>
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<td>Pascal</td>
<td>Research Associate</td>
<td>Fraunhofer HHI</td>
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<td>Patrick</td>
<td>CTO</td>
<td>Lumibird</td>
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<td>Peppino</td>
<td>R&amp;D Optical Engineer</td>
<td>Cordon Electronics Italia</td>
<td>Italy</td>
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<tr>
<td>Peter</td>
<td>Professor</td>
<td>Chalmers University of Technology</td>
<td>Sweden</td>
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<td>Peter</td>
<td>Scientist</td>
<td>TNO</td>
<td>The Netherlands</td>
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<tr>
<td>Pierre</td>
<td>A&amp;D Sales Leader</td>
<td>First Sensor</td>
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<td>Qin</td>
<td>Senior Expert</td>
<td>RISE Acreo</td>
<td>Sweden</td>
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<td>Ron</td>
<td>VP &amp; CTO</td>
<td>Glenair</td>
<td>USA</td>
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<tr>
<td>Simon</td>
<td>SWIR Sensor Engineer</td>
<td>New Imaging Technologies</td>
<td>France</td>
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<tr>
<td>Simon</td>
<td>Account Technology Executive</td>
<td>Cadence</td>
<td>United Kingdom</td>
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<tr>
<td>Stephane</td>
<td>Benelux Area Manager</td>
<td>Quantum Design Europe</td>
<td>Belgium</td>
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<tr>
<td>Thomas</td>
<td>Director Business Development</td>
<td>KLEO Connect</td>
<td>Germany</td>
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<td>Thomas</td>
<td>CSO &amp; Member of Board</td>
<td>TOPTICA</td>
<td>Germany</td>
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<td>Thomas</td>
<td>Payload Performance Engineer</td>
<td>European Space Agency</td>
<td>The Netherlands</td>
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<tr>
<td>Tim</td>
<td>Project Manager</td>
<td>Carl Zeiss Spectroscopy</td>
<td>Germany</td>
</tr>
<tr>
<td>Vania</td>
<td>Researcher</td>
<td>CNR-Institute for Photonics &amp; Nanotechnologies</td>
<td>Italy</td>
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<tr>
<td>Ville</td>
<td>Managing Director</td>
<td>SCHOTT PrimoCer</td>
<td>Finland</td>
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<td>Yan</td>
<td>CEO</td>
<td>LIGHT TEC</td>
<td>France</td>
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<td>Yves</td>
<td>Professor</td>
<td>Haute Ecole ARC Ingénierie</td>
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**III-V Lab** is an industrial R&D laboratory jointly owned by two major companies, Thales (40%) and Nokia (40%), and the French public research organization CEA. III-V Lab conducts R&D activities in the field of photonics and micro/nano-electronic semiconductor components for different application, such as telecoms, defence, space, security, safety, etc. Relying on a high level of expertise and advanced facilities in III-V materials growth and processing and their integration on Silicon, III-V Lab develops a wide range of discrete components and integrated circuits, including photonic Integrated Circuits (PICs), micro/nano-electronic circuits for telecoms, microelectronic circuits for microwave and power applications, advanced infrared imagery sensors. III-V Lab has also the capacity to produce limited quantities of epitaxial wafers, components, modules or subsystems). Such capacity is particularly adapted to address in a flexible way the rapid evolution of the market, offering to its members or partner industrial companies an early access to the components for their system development and even preliminary deployment. [www.3-5lab.fr](http://www.3-5lab.fr)

Frederic Van Dijk (Research Engineer, Optronics Sources Group Leader) is leading the “near infrared optronic devices” group within III-V Lab that is working on design, fabrication and characterization of III-V semiconductor laser sources, photodetectors and photonic integrated circuits covering the 700 nm to 1700 nm range for optical analog signal distribution, high speed data sampling, LIDAR systems, free-space optical transmissions, atomic clocks. He is in particular involved in studies on high power laser sources at 1.5 μm, and photonic integrated circuits for microwave and remote sensing.

**Aarhus University** is Denmark’s largest university. The Department of Engineering was established in 2011, with a focus on a strong interplay with industry and on applied research. The relevant research areas in Electrical Engineering are microwave photonics, optical sensor systems, biomedical devices, and electronic-photonic convergence for future high-capacity systems. [www.au.dk](http://www.au.dk)

Martijn Heck (Associate Professor) is Associate Professor at the Department of Engineering, Aarhus University, where he works on photonic integration and its applications, with a focus on microwave and terahertz photonics and chip to chip and on-chip interconnects. He received the M.Sc. degree in applied physics and the Ph.D. degree from the Eindhoven University of Technology, in 2002 and 2008, respectively. From 2007 to 2009, he was a Postdoctoral Researcher at the COBRA Research Institute and the Laser Centre, Vrije Universiteit, Amsterdam. From 2009 to 2013, he was Research Scientist and Associate Director of the Silicon Photonics Center at the University of California Santa Barbara.
AEMtec develops, qualifies and manufactures next level optoelectronic assemblies in compliance with highest quality, security and sustainability standards. In a cleanroom environment (ISO class 5 to 8) AEMtec offers a unique spectrum of high-end chip-level technologies: Wafer Back-End Services (UBM, SBA, Dicing), high speed / high accuracy Die- and Flip Chip Bonding, Au and Al Wire Bonding, SMT, assembly of Optical Components, Box-Build, 3D integration. AEMtec is certified for the automotive, aerospace and medical industries. www.aemtec.com

Dan Negrea (Senior VP for New Technologies) has an MScEE from the universities in Bucharest and Vienna, and MoT from IMD in Lausanne. Dan has led over the past 25 years multiple R&D teams in Austria, Switzerland and Germany. He joined AEMtec in 2008. Presently, he holds the position of VP for New Technologies with a clear focus on optical and space applications, thus enhancing the technology leader profile of AEMtec Berlin.

Ludovic Godin (Sales Manager France) has a long experience in high end Pcb technologies over the last 15 years, completed by the AEMtec knowledge that offers high level of micro-electronics solutions using high-end chip-level technologies in the fields of medical, data and telecommunications, industrial & automation, semiconductor, security and automotive industries.

Aistech Space is a geospatial intelligence company that aims to provide Earth observation services ranging from near-real-time image acquisition to data interpretation using a host of satellite/aircraft/drone-based platforms. Specifically, Aistech Space has developed and implemented its own Multi-Spectral Telescope (MST) that can be integrated into a 6U nanosatellite that is capable of acquiring images in three well defined spectral ranges simultaneously: visible (VIS), near infrared (NIR) and thermal (LWIR). By 2022 Aistech expects to fly a constellation of 100 nanosatellites that will bring light to organizations providing a new vision of the Earth, will help democratize access to space knowledge and will provide added value to companies, organizations, and administrations. www.aistechspace.com

Luis José Salazar-Serrano (Optics Payload and Operation Specialist) received a Ph.D degree in Photonics from ICFO (The Institute of Photonic Sciences) in Barcelona in 2016 and, in the same year, received a Ph.D degree in Physics from the Universidad de los Andes in Bogotá - Colombia. In October 2016, he joined Aistech Space to lead the activities of R&D related to the design, development, manufacturing, testing, and integration of a multispectral telescope intended for Earth Observation that can be integrated into a 6U nanosatellite.
Airbus has three main business segments in commercial aircraft, helicopters and defence and space. Defence and Space is a global pioneer providing innovative, effective space and defence solutions and services worldwide. Airbus Defence and Space develops and engineers cutting-edge and peerlessly reliable products in the fields of defence and space. Future technologies are reshaping industries and markets in unprecedented ways and at extraordinary speeds. The organisations that succeed in this environment are those that can adapt rapidly to new opportunities and challenges. Rather than seeing them as a threat, Airbus recognises that future technologies give us a competitive advantage as we shape the future in the air and space sectors. www.airbus.com

Ludovic Blarre (Laser Communication and Photonics Development Manager) graduated in optics in 1990. Since then, he has been involved within the Airbus group and its affiliates in the development of many types of satellite equipment based on optics and photonics. He now works for Airbus Defence & Space in Toulouse within the telecom satellite business group of Space Systems where he is in charge of the satellite optical communication roadmap, coordinating within the group and with external key partner the activity and business development of free space optical communication.

Katarzyna Balakier (Senior Photonics Engineer) works on developing photonics systems for space applications at Airbus Defence and Space, UK. Her professional interests include microwave photonics systems, photonic integrated circuits and optical connectivity. Katarzyna is also a UK Research and Innovation (UKRI) Fellow and a member of Photonics group at University College London (UCL), which she joined as a Marie Curie Research Fellow. Prior to that, she worked as Engineer for LG Electronics in Poland and as Optical Engineer for Sener Ingenieria y Sistemas in Spain. Katarzyna holds a MSc with specialisation in opto-electronics from Bialystok University of Technology in Poland and a PhD in photonics from UCL.

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

Beamagine is a spin-off company from the Center for Sensors, Instruments and Systems Development (CD6) at UPC-BarcelonaTech. The company developments rely upon the knowledge accumulated over twenty years in LIDAR technology and optomechanical practice, generated at research level. Beamagine targets to put in the market specific lidar technologies that have been conceived, developed and tested in various real world applications. Our mission is to develop LIDAR, TOF, electro-optical and single photon sensors, with a focus on imaging cameras for robotic sensing applications. www.beamagine.com
Jordi Riu (CEO) is CEO at Beamagine since 2016. He holds a BSc in Telecom Engineering and MSc in Electronic Engineering and finished his PhD in Optical Engineering while working on R+D projects at CD6. He is a Senior Research Engineer specialized in electronic engineering and software. He has centred his research area in new technologies for imaging LiDAR systems. He has published various peer-reviewed articles as a first author and various contributions in international conferences. He also holds two licensed PCT patents related to a new scanning device for LiDAR 3D imaging. In addition, he has worked for more than 6 years as a researcher in private held companies like SONY, INDRA and On-Laser.

Bright Aerospace, located close to Pavia, Italy, is a privately-owned company established in early 2017 and making part of the Bright Solutions group. The company is focused on the development and manufacturing of Solid State Lasers dedicated to Aerospace applications. Leveraging on our expertise in manufacturing highly ruggedized laser units designed for flight, and on our experience in the development of lasers for satellite instruments, Bright Aerospace can offer all kinds of design, customization and manufacturing services to customers involved in the development of laser instruments for space missions. www.brightaerospace.com

Enzo Nava (CTO) is a physicist and expert in laser and optoelectronics with more than three decades of expertise in the development of solid-state laser sources for space applications and atmospheric lidar, etc. He was involved since 1986 in several European (ESA-ESTEC, UE) and international projects for space lidar for measurements of wind speed, aerosol, water vapor and pollutants content. Enzo is currently employed as Chief Technical Officer of Bright Aerospace, Pavia.

Cadence helps speed the design of innovative electronic products that transform the way people live and work. Our Intelligent System Design strategy drives our efforts to provide the resources semiconductor and systems companies need to develop highly differentiated products in 5G, aerospace and defense, automotive, cloud data center, consumer, industrial, internet of things (IoT), machine learning, mobile, photonics, and other market segments. We provide leading electronic design automation (EDA) software and hardware for chip, package, board, and system design as well as semiconductor intellectual property (IP). Cadence has teamed with Lumerical Solutions to provide an electronic/photonic design automation (EPDA) environment. Cadence is listed as one of FORTUNE Magazine’s 100 Best Companies to Work For. www.cadence.com

David Mallon (Senior Principal Software Engineer) received a BSc in Applied Physics from the University of Strathclyde. He holds an MSc in Design and Manufacture of Microelectronic Systems and a PhD In High Level Synthesis from the University of Edinburgh. After starting his career in Photolithography, he moved into the area of Electronic Design Automation. His career at Cadence spans 25 years, during which he has worked on physical design tools for FPGA, ASIC and Photonic technologies. He holds 5 patents in this area.
Simon Fielding (Account Technology Executive) received a BSc in Computer Science from the University of Leeds and started his career designing digital audio chips before moving into satellite flight and ground-station equipment design for communications and imaging systems, including DRS and SOHO. Subsequently, he transitioned into Electronic Design Automation in the areas of custom, digital design, test, verification and sign-off covering various technical and commercial roles. Simon was also involved in the IP industry and worked on custom memory and foundation IP, yield management and characterization flows prior to joining Cadence 8 years ago.

Caeleste is a design house for turn-key, high-end, high performance, CMOS image sensors. Caeleste specialty is custom design, strong IP and long-term R&D consulting. The company IP enables hybrid or mixed arrangements that rival monolithic solutions in terms of noise immunity and S/N; ultra-low noise readout in the presence of large amounts of fast switching digital logic in the pixel; high fill factor in monolithic CMOS sensors; time gating pixels. IP for arrays of X-ray photon counters with high yield, enabling unprecedented performance in noise floor, energy discrimination and MTF. The team consists of experienced designers, imaging scientists and technology experts who have built their expertise over the years designing many advanced and first-off image sensors. We focus on application domains as Medical and Space imaging, as well as on the advanced niches in Automotive, Factory automation, Biometrics, Scientific imaging, Spectroscopy. [www.caeleste.be](http://www.caeleste.be)

Jan Vermeiren (Business Development Manager) graduated from the KU Leuven in 1979. He joined the ESAT labs of the university as a research assistant. In 1984, he joined imec, where he was responsible for CCD read-out circuits for infrared detectors and for the development of a CCD-CMOS technology. He was also system architect for the deep cryogenic readout circuits developed for ISOPHOT. In 1992, he joined OIP, where he was responsible for the initial system studies for AMIRIS, now called APEX, and for the creation of a new family of image intensified handheld equipment. In 2000, Jan was one of the founders and CTO of Xenics, Leuven – Belgium. In the next years, he was responsible for all technology developments and infrared camera designs, as well as for the acquisition of large projects. Together with the Xenics staff, he developed the sensors and readout circuits for Egysat-1, Sich-2, the VNS sensor on Earthcare, the ROICs for the BBR on Earthcare and the long linear SWIR sensors for Proba-V. Since 2015, Jan is working as Business development Manager at Caeleste, where he is the first customer contact for beyond-state-of-the-art custom designed image sensors and derivative products.
CAILabs was founded in 2013, Cailabs is a French deep tech company which designs, manufactures and distributes innovative photonic products for telecommunications, free space transmission, industrial lasers, and LANs. A global leader in complex light shaping, its technology is currently protected by 19 patent families. Its innovative optical components are used in a variety of sectors and have contributed to several world records (notably the optical fiber bandwidth record achieved by the Japanese operator KDDI). Since 2016, Cailabs has obtained numerous innovation awards worldwide. www.cailabs.com

Jean-François 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-François was Senior Associate at the Boston Consulting Group. Jean-François holds a PhD in quantum optics from the Université Pierre et Marie Curie and the Australian National University. He received the Forbes’ 30 under 30 Science and Healthcare European award in 2016.

Nicolas Laurenchet (Business Director - Advanced manufacturing, new space, defense and sensing application // Canunda & Tilba) is in charge of business development for advanced manufacturing, new space, defense and sensing application addressed by Cailabs with its Canunda and Tilba product lines. Prior to that, he co-founded a tech company and has been in charge of business and partnership development at ONERA. He holds an engineering degree and has a specific interest and background in customer relationship, new business development and innovation.

Chalmers University of Technology conducts leading research in photonics through its Photonics Laboratory. Optical communication is a major area of research, with efforts on system and device technologies for applications spanning from long haul transmission to short reach interconnects. The research in fibre optical communication is coordinated within the research centre FORCE www.chalmers.se/mc2/force-en. Efforts are also invested in the development of new photonic materials and device structures for emission and detection at wavelengths spanning from the ultraviolet to the mid-infrared. The Photonics Laboratory teaches basic and advanced photonics courses in the master program Wireless, Photonics and Space Engineering. www.chalmers.se/mc2/EN/laboratories/photonics-laboratory

Peter Andrekson (Professor) received his PhD in 1988 and is a professor of photonics since 2000. Currently, he is head of the Photonics Laboratory at Chalmers and director of the FORCE center. He has spent 7 years in the USA (Bell Labs, Cenix Inc., Lehigh University). He co-founded and was the CEO of the optical test & measurement company Picosolve Inc., now part of EXFO. Andrekson is a Fellow of OSA, IEEE and the Royal Swedish Academy of Engineering Sciences. He is author of over five hundred scientific publications and conference papers in the area of optical communications, including four tutorials at the Optical Fiber Communication Conference (OFC). He is or has served on several technical program committees, and has also twice served as an expert for the evaluation of the Nobel Prize in Physics. He held an ERC Advanced Grant for work on phase-sensitive optical amplifiers (2012-2017), has participated in several EU projects, and is currently a distinguished professor by the Swedish Research Council (VR).
Crystalline Mirror Solutions (CMS) has invented, internationally patented and industrially optimized single-crystal semi-conductor supermirrors. Thanks to this novel optical coating technology, we enable customers in industrial (gas sensing instruments, laser machining equipment, high-end LIDAR systems, IR imaging solutions...) and scientific (atomic clocks, ultra-precision laser sources, gravitational wave detectors...) markets to push their applications to unprecedented performance and/or efficiency levels. We thereby help them, and end users, build and sustain their competitive edge through technology leadership and/or improved economics of their processes. Benefits include step-function improvements in spectroscopic precision measurements (10x higher signal-to-noise ratio) and productivity breakthroughs in laser machines (30x less heat build-up and resulting possibility to increase power levels and pulse repetition rates). Founded in 2013 as a spin-off from the Vienna Center for Quantum Science & Technology (University of Vienna), CMS employs 12 staff (10.75 FTE) at its 2 sites in Austria and California. www.crystallinemirrors.com

Jörg Nowack (CEO) has been CEO of CMS since March 2018. He joined CMS from TT Electronics, a UK-headquartered manufacturer of highly engineered electronics components and systems for, among other demanding application sectors, aerospace, defence & security, industrial instrumentation and medical equipment, where he was in charge of strategy and transformation. Prior to TT Electronics, he held positions at Hitachi (Head of Group Business Development Europe), McKinsey (Senior Consultant) and Philips (Innovation Project Manager) and also gained work experience at the European Commission - DG Research and Schneider Electric. Jörg is passionate about bringing new technology, including CMS’s, to the market as part of practical solutions to next-frontier problems or to unlock ‘the next big thing’. Having lived, worked and studied in 7 countries (of which 6 ESA member states), Jörg speaks English, French, Spanish, Polish (and some Dutch, Italian and Japanese) in addition to his native German.

The Institute for Photonics and Nanotechnologies of the Italian National Research Council carries out innovative research in the fields of photonics and nanotechnologies. The Padova Division is mainly involved in the design and realization of optical systems for space having developed instruments for Rosetta, BepiColombo, and Solar Orbiter missions. IFN Padova is also focused on the development, testing and qualification of optical coatings (filters and mirrors) from EUV up to NIR for space application and on other scientific fields, such as deformable mirrors for industry and medicine, optical gas sensors, laser metrology and gas spectroscopy. The Rome Division is involved in the field of QKD with superconducting nanowire single photon detectors. IFN actively collaborates with the Italian Space Agency (ASI) and the aerospace industry. www.ifn.cnr.it

Vania Da Deppo (Research Scientist) has a research position at the CNR-Institute for Photonics and Nanotechnologies in Padova (Italy). Since 1998, she has been working on the optical design, realization, test and calibration of many instruments for space applications, such as the WAC for the Rosetta mission, SIMBIO_SYS on-board the BepiColombo spacecraft, METIS for the Solar Orbiter, ARIEL and other on-going and future ESA missions. She has also been involved in the design and realization of instruments for industrial applications, mainly in the ophthalmic field.
Cordon Electronics was born in February 2017 with the acquisition of all assets and human resources of the former Linkra Srl by the French Cordon Group, leads in the support of Original Equipment Manufacturers (OEM) in the design, manufacture and integration of Photonics and electronic products. Based in Milan, Italy, the company’s manufacturing services aims to optimize the manufacturing process, support client on prototyping and pre-series activity for new products, and perform design to cost program effectiveness. Its Microtech Business Unit, originally develops and manufactures Microwave modules and transceivers up to 80 GHz primarily geared for the telecommunications and defence markets, and is now expanding its service to other photonic markets like medical and aerospace. Cordon Electronics Italia provides Photonics packaging and integration services with extensive state of the art know how and network (supply chain, equipment suppliers, universities and research institutes) gathered through European projects and the team members back ground. The gathered know how on photonic integration and packaging of components and modules based on Silicon Photonics, Indium Phosphide as well as hybrid integration technology platforms, is being made available for SME and large companies for packaging and product development service of photonic components and modules. www.cordongroup.com

Peppino Primiani (Optical Engineer) obtained his degrees, an M.Eng. degree in Nanotechnology at Politecnico di Torino and a M.S. in Quantum devices at Université Paris Diderot, both in in 2014. His Master Thesis work was carried out at Thales Research and Technology France, Palaiseau, within the III-V Lab, where he worked on high power Master Oscillator Power Amplifiers (MOPA) on InP Technology. From 2014 to 2017, he was at Thales Research and Technology France, Palaiseau, within the III-V Lab, to pursue his Ph.D. in Physics on the design and characterization of Hybrid (InP/Si) Photonic Integrated Circuits for the generation of high purity microwave signals, in the frame of the French industrial Ph.D. program CIFRE with the University of Rennes. He joined Cordon Italia in February 2018 to work on Photonic systems, Radio over Fiber and related technologies and packaging of microwave and optoelectronic modules.

Critical Distance is working closely with several Photonics-related organisations as well as EPIC to explain the growing relevance of Photonics to the rest of world. The work includes assembling profiles of the most innovative companies into an investment portfolio. Jonathan Marks leads a guild of independent writers, reporters, producers and researchers to make this happen. https://jonathanpmarks.wordpress.com

Jonathan Marks (Director) is a British science analyst and strategic thinker based in the Netherlands. He is an active documentary maker and international broadcaster specializing in media analysis and scientific reporting. Jonathan contributes regularly to mainstream media as well as hosting the Media Network podcast. He is particularly passionate about the success of Photonics and all the fascinating applications it drives.
Diamond is a worldwide leader in supplying high precision fiber optic solutions based on different technologies for markets such as: Photonics, Laser, Industry, Telecom, Space/Defence, Medical, etc. Vertically integrated with ceramic, plastic injection, machining and industrialization in house, Diamond can design, produce and test products for specific needs and already has a very large product catalog for various applications. Specifically for Space, with more than 25 years of heritage, the support of an internally accessible ISO/IEC certified laboratory and clean room, allowed Diamond to propose the first ESA space qualified optical fiber connection assemblies with the Mini AVIM™. Specified under ESCC 3420/001 and qualified variants defined in certificate 355 from ESCC QPL, the Mini AVIM™ is the best representative of the AVIM™ Family. For applications such as high-power, Diamond has developed unique technologies based on the expanded beam, with the aim of reducing the power density at the optical interfaces for contact and non-contact connection, injection and output in both single channel connectors (E-2000™, DMI, F-SMA Psi) and multi-channel connectors (HE-2000, MIL-38999 DM4, MIL-83526 DM4). For other applications (non-telecom) using Singlemode small core fibers and PM fibers, Diamond offers the VIS/NIR optical interfaces that can be applied on almost all connector types. Aiming to achieve the best optical performances, Diamond utilises its unique and patented Active Core Alignment (ACA) technology, which minimises the lateral offset of the fiber core enabling unrivalled low Insertion Loss values. www.diamond-fo.com

Frédéric Taugwalder (Senior Product Manager, Chief inspector for ESCC products) is Senior Product Manager at Diamond SA where he is working since 2005. At Diamond, he is responsible for polarization maintaining products, high power (laser) and space markets worldwide. He obtained his diploma (M.SC) in Microtechnology at EPFL. Being a specialist in optical sensors and fiber products acquired during a brief stage at CSEM, he continued his career in California at JPL/Caltech and was a key person in the start-up and development of VIOSENSE. Mr Taugwalder is author and co-author of various articles in the domain of measurement, fibre optics and space. Furthermore, he is co-inventor of several patented micro sensors.

The German Aerospace Center (DLR) Institute of Technical Physics (TP) develops laser systems for applications in aerospace as well as in the areas of security and defense. At sites in Stuttgart and Lampoldshausen, scientists, engineers and technicians work on interdisciplinary issues in the following key areas: detection and removal of space debris, laser-based remote detection of harmful and hazardous substances, long range laser effectors, and laser-based flight instruments (air data). www.dlr.de/tp

Gerd Wagner (Physicist) studied physics and chemistry at the University of Hohenheim (Stuttgart, Germany) and received his PhD in 2010. In 2014, he took a position at NIST (Boulder CO, USA) to develop multi-frequency techniques and instrumentation to simultaneously measure CO2 and H2O using IPDA LIDAR (integrated path differential absorption LIDAR) and DIAL (differential absorption LIDAR) methods. In August 2018, he joined DLR TP to develop a transportable space debris laser ranging station.
Eblana Photonics specialises in the design and manufacture of advanced semiconductor FP and DFB-type Laser Diodes from 650nm - 2400nm, for Communications, Sensors & Measurement in packaging options that include: 14-Pin Butterfly, 7-Pin High Speed Butterfly, TO39 (Can w/ TEC) and TO56. Ultra narrow linewidth devices are produced for use in metrology and atomic clock applications. Custom processes as well as specialised photonic devices including MMIs, SOAs, SLEDs and lasers arrays are also part of the portfolio. www.eblanaphotonics.com

Katelin Smith (R&D Engineer) has recently joined Eblana Photonics as an R&D engineer. She completed her master’s degree at University College Dublin in Space Science & Technology in 2018 and was hired by Eblana after completing an internship there. At Eblana, Katelin works on various R&D projects including investigating new technology developments for ESA.

Diarmuid Byrne (Director of Design and Development) has a PhD in laser physics and a bachelor’s in experimental physics both from Trinity College Dublin. Diarmuid is currently Director of Design and Development at Eblana Photonics, where he concentrates on emerging technologies in III-V and Si photonics for telecommunications, industrial and sensing applications. Diarmuid is currently engaged in designing integrated laser, modulator and amplifier devices for optical communication and multiple species gas sensing applications.

Eneka Consulting is an innovation consulting firm dedicated to Photonics Technologies and Markets, for industrial companies, research laboratories and innovation organisations. It provides services in innovation strategy, collaborative research projects and funding, photonics technologies scouting, technology transfer, innovation ecosystems Intelligence, specialized communications and events, in France and Europe. It covers Aerospace, Defence and Security, Automotive, Digital Health and Industry 4.0 markets. Some industrial references: Airbus, Thales, Corning, Valeo, Sanofi, Orange, Peugeot, Zodiac Aerospace, Systra.

Eneka Idiart-Barsoum (Founder and CEO) of Eneka Consulting, an innovation consulting firm dedicated to Photonics Technologies and Markets. She received her PhD on Lasers Physics in 1996, from Pierre and Marie Curie University in Paris. She then worked 25 years in photonics industry, for Telecoms (Orange, Corning), Defence and Security (Airbus, Thales) and Automotive (Valeo) markets. She hold different positions in R&D, Business Development and Collaborative Innovation. She was Valeo Group representative to Photonics 21 Board of Stakeholders, and led the Mobility WG to establish in 2018 within Photonics France the national Photonics roadmap. She founded then Eneka Consulting, based on her photonics, collaborative innovation and funding expertises.
EPIC is the European industry association that promotes the sustainable development of organisations working in the field of photonics. EPIC represents 500 members in 33 countries [www.epic-assoc.com](http://www.epic-assoc.com)

**Jose Pozo (Director of Technology and Innovation)** is a Senior Photonics specialist with extensive background in technology, market knowledge and an eye for business opportunities, with 14+ years of professional background. Experienced at building consortia and supply chains for the development of innovative solutions towards improving the state of the art of the Photonics Industry. Highly regarded scientist as well as an award-winning conference speaker with over 70 publications (including a Nature paper in 2015). Member of the board of IEEE Photonics Society – Benelux.

**Auri Ripoll (Marketing Manager)** received a bachelor’s degree in Biology from the University of Barcelona and a Masters in Marketing Management from EAE Business School. She started her career as a scientific professional working for over nine years in several companies. She has worked as a marketing manager in a chemical company where she was responsible for the marketing strategy, including branding and digital marketing actions, where she developed online advertisement and social networks campaigns. Auri has also organised the participation of companies in international exhibitions.

**Elena Beletkaia (Project Leader)** graduated from Lomonosov Moscow State University (MSU) specializing in biophysics. In 2015 she acquired her PhD in Leiden University with her research focusing on biochemical and biophysical mechanisms underlying metastasis of Ewing sarcoma. Later in collaborative setting of NKI and Twente University, Elena investigated application of a non-invasive spectroscopic/multiphoton methods for intraoperative resection margins assessment. All her research projects involved understanding and use of multiple micro- and spectroscopic techniques.

**Neringa Norbutaite (Events Manager)** is a 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 business information management as BA (2012, Lithuania), human resources management as MA (2015, Lithuania) & was studying international events management during her exchange semester (2010, the Netherlands).

**Ana Belén González (R&D Manager)** is currently Project Leader at EPIC (European Photonics Industry Consortium). Her expertise relies on the development of systems based on integrated photonic circuits, packaging and assembly, and the investigation of applications such as chemical/biological sensing and Datacom. In addition, she has been involved in several technology transfer and business development processes. 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).
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

Iain McKenzie (Senior Optoelectronic Engineer) is currently managing the research and development of fibre optic and photonic components for future space applications. His research interests include optical communications, optical fibre sensors, microphotonicics, optoprotechnics and optoelectronic packaging for harsh environments.

Thomas Kanitz (Payload Performance Engineer) is working as Payload Engineer in Earth Observation. He has followed the ALADIN/Aeolus development since instrument integration and is working on the in-orbit data now. He is involved in mission operation and planning, ground processor development, as well as science activities and validation studies. Following the successful launch of ALADIN, he has started working on ATLID/EarthCARE.

Eamon Murphy (Laser and Optoelectronics System Engineer/Physicist) studied Experimental Physics at University College Dublin (UCD), followed by research in spectroscopy and lasers (UCD-Department of Physics). DLR-Oberpaffenhofen (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.

Harald Hauschildt (ARTES ScyLight Programme Manager) is the ESA Program Manager for the ARTES ScyLight Program, dedicated to Optical Communication and Space based Quantum Cryptography. In this role, Harald is also in charge for the preparation of ESA’s HydRON programme to develop and demonstrate a “High Throughput Optical Network” in Space. Furthermore, Harald is preparing the “Secure and Cryptographic Mission” called “SAGA” addressing Quantum Key Distribution from Space as well as the extension of the European Data Relay System (EDRS) to provide global coverage. In his former career life, Harald worked at DLR (German Aerospace Centre) in the role of the German Delegate to ESA and was responsible for the German participation in the USA-German Laser Crosslink Program between the US NFIRE and the German TerraSar-X Satellite which was the starting point for ESAs EDRS Programme. Dr. Hauschildt has a PHD in Physics and Astro-Physics from the University Bonn, Germany and has been working at the California Institute of Technology (Caltech), Pasadena (USA) and the Max-Planck-Institute for Radioastronomy, Bonn (Germany).
ETH Zurich is a one of top leading university in Europe and in the world since its foundation in 1855 in Zürich, Switzerland. Over the decades, multiple connections have been developed and fostered with universities and companies all over the world, leading to more than 400 approved projects within the Seventh Framework Programme for Research and Innovation (FP7). The Department of Physics (D-PHYS, www.phys.ethz.ch) and the Department of Information Technology and Electrical Engineering (D-ITET, www.ee.ethz.ch) have in particular a long experience working in the field of photonics. With several national centers of competence in research (NCCR), state-of-the-art facilities and laboratories (FIRST, FastLab, etc.), ETH Zurich is pushing the frontiers in the fields of quantum optics, quantum cascade laser, ultrafast lasers, THz, optical communications, nanophotonics and several other areas.

ficonTEC is a premier supplier of semi- and fully automated optical device assembly and testing systems for the optical industry, including HPLD manufacturing, fiber-optics and opto-electronics, medical technology, security and military applications, R&D, telecommunications, and others. ficonTEC’s automation solutions are based on its expertise in process technology and systems engineering where each solution is appropriately customized from a proven line of system platforms.

Ignazio Piacentini (Director of Business Development) took up the position of Director of Business Development at ficonTEC Service GmbH 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. During this time, Ignazio also served two 3-year mandates as a member of the Board of Directors of EMVA (European Machine Vision Association). 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).

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.ethz.ch

www.ficontec.com

www.first-sensor.com
**Pierre Chazan (Sales Manager)** is currently Regional Sales Manager and A&D Leader for First Sensor AG since 2016. Prior to First Sensor, Pierre Chazan worked in R&D for Alcatel and Fraunhofer Institute IAF Freiburg. Then he joined Atmel as Sales Manager for imaging devices and later moved to e2v as a Key Account Manager for A&D in Europe. In the past 13 years, Pierre worked on numerous opto-electronics projects, such as new imaging detectors for earth observation satellites or new cameras for low light vision. Pierre owns a PhD and an Engineering degree from Polytechnique Institute of Grenoble (INPG) in microwave and opto-electronics. Pierre has an MBA from IAE Paris Sorbonne.

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**Fraunhofer Heinrich Hertz Institute** is a world leader in the development of mobile and fixed broadband communication networks and multimedia systems. From photonic components and systems to fiber optic sensors and high-speed hardware architectures, the Heinrich Hertz Institute works together with its international partners from research and industry on building the infrastructure for the future Gigabit Society. Fraunhofer HHI is your competent partner for high speed optochips, for photonic integrated circuits, and for terahertz sensing. [www.hhi.fraunhofer.de](http://www.hhi.fraunhofer.de)

**Pascal Rustige (Research Associate)** received his MSc in physics at the Humboldt University of Berlin, Germany, in 2017. Since then, he has been with the Fraunhofer Heinrich Hertz Institute, where he is member of the detectors group of the “Photonic Components” department. His research interests are InP-based photonic detectors with focus on development of APDs and SPADs for sensing.

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**Fraunhofer INT**

The **Business Unit „Nuclear Effects in Electronics and Optics (NEO)“ at Fraunhofer INT** investigates the effects of ionizing radiation on electronic, opto-electronic, and photonic components and systems. Its work is based on more than 40 years of experience in that field. The INT performs irradiation tests based on international standards and advises companies regarding radiation qualification and hardening of components and systems. The knowledge obtained in years of radiation testing is also used for the development of new radiation sensor systems. These activities are performed either at irradiation facilities installed at the INT or at partner institutions to which our scientists have regular access. A multitude of modern equipment to measure electrical and optical parameters is available. Furthermore, our institute runs a precision mechanical workshop and an electronic laboratory. This enables us to conduct most of the irradiation tests without help or equipment of the customer. [www.int.fraunhofer.de](http://www.int.fraunhofer.de)
Jochen Kuhnenn (Head of Nuclear Effects in Electronics and Optics) received a PhD degree in nuclear physics from the University of Cologne, Germany in 2001. He joined Fraunhofer INT in 2001 as a scientist, investigating the effects of ionizing radiation on optical fibers and components. His expertise covers the fields of optics, photonics, nuclear physics, and radiation effects. Since 2014, he is head of the unit “Nuclear Effects in Electronics and Optics” at Fraunhofer INT and responsible for the completion of about 60 projects per year in his domain. Dr. Kuhnenn filled a patent and authored or co-authored more than 40 contributions in international refereed journals. He is also referee in more than 5 journals related to radiation effects and fibre optics (IEEE TNS, IEEE JLT, JNCS, Applied Physics B, Optics Communications, ...) and regular member of the relevant international conferences in the field.

Fraunhofer Centre for Applied Photonics, Glasgow, UK undertakes direct contract R&D for industry and does collaborative research projects with H2020 or InnovateUK type support. The main activities of Fraunhofer CAP include applied research, development, prototyping and small-scale pre-production of photonic and sensor-based technologies. Core competencies are in laser sources and systems (solid-state, semiconductor disk, fibre, OPOs, ultrafast) and sensor and imaging systems. Fraunhofer CAP works in all sectors including energy, lifescience, defence, space and quantum technology.

www.cap.fraunhofer.co.uk

John-Mark Hopkins (Deputy Head of Centre) has worked for 24 years in advanced laser research. His experience has centred on the development and optimisation of many high-power and finesse semiconductor and solid-state laser systems. He received his PhD from the University of St. Andrews in 1999 for work on compact femtosecond pulse lasers with Professor Wilson Sibbett. In 2001, he moved to the Institute of Photonics at the University of Strathclyde in Glasgow where he worked on novel 1.3um and 2um semiconductor disk lasers and crystalline solid-state lasers across a wide wavelength and power range. He was crucially involved in the engagement of Fraunhofer in the UK and the formation of the Fraunhofer Centre in Applied Photonics. Here, he heads the Lasers and Laser Applications Team with wide-ranging interest in the development of practical laser systems for a variety of important applications and industry sectors. He was made the deputy head of the Centre in 2014 and continues to lead the Laser and Laser applications team.

Glenair began operations in 1956 as the first company specifically founded 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 fibre based solutions to 100Gb/s with single wavelength, CWDM and DWDM wavelength plans. Glenair also offers RF-over-Fibre solutions up to 35GHz, high power optical amplifiers and very high-power handling optical connectors.

www.glenair.co.uk www.glenair.com
Ron Logan (Vice President and Chief Technology Officer) is Vice President and Chief Technology Officer, Electronics and Photonics, at Glenair. Ron started his career at the NASA Jet Propulsion Laboratory and has subsequently been a founder and leader in a series of companies, always with an emphasis on photonic products for harsh-environment military and aerospace applications. Ron is a 2015 recipient of an IET Engineering Achievement Medal and has served on SAE and ARINC Fiber Optics and the SpaceFibre standards committees. He is an inventor of more than 30 issued patents and an author of over 75 technical publications and conference presentations.

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.

GLOphotonics is a spin-off of a research group, led by Professor Fetah BENABID, which develops, manufactures and markets gas phased photonic components using proprietary Hollow Core Photonic Crystal Fibers (HC-PCF) technology. The unique features of this innovative fiber technology provide a flexible and cost effective way to shape and transport Ultra Short laser Pulses (USP) with extremely low attenuation and nearly-free temporal and spectral distortion. GLOphotonics product offer include: The Photonic Microcell (PMC), a stand-alone component that consist of a HC-PCF filled with gas and fiber terminations which can be tailored to customer needs. The Beam Delivery System (BDS), a ruggedized and pre-aligned module for high power beam delivery, available for Yb, Nd:Yag lasers and also now for 500 – 700 nm spectral range. www.glophotonics.fr

Jean Sauvage-Vincent (Business Engineer) studied optical engineering at Telecom Saint-Etienne (France) where he earned a PhD Thesis on the development of plasmonic solutions applied to optical document security. He introduced in 2010 with the French company Surys the first optical component for banknote based on plasmon. With 10 years of experience in the field of optical components development, he joined GLOphotonics in 2018 as a Business Developer for America, Europe, Middle East and Africa.

The Haute Ecole Arc Ingénierie supports a globally unique industrial environment, developing directly applicable and applied research that closely reflects the region’s economic and industrial fabric. The results of this research are constantly incorporated into the teaching programmes delivered at HE-Arc Ingénierie. Through its teaching programmes and research activities, it offers its partners a genuine technological intelligence platform designed to support their innovations and developments. HE-Arc Ingénierie’s strategic positioning is defined around four fields of activity corresponding to the principal
design and production specializations encountered in the Swiss Jura Arc region: Smart & micro-manufacturing, Smart-sensing and digitalization, Watchmaking and Industrial luxury, Health & Medical technologies. The metrology and industrial vision group is a leading entity within the university that has a long experience in advanced optical sensing. The activities can be related to the development of advanced optical sensors and measurement systems, such as fiber optic sensors, interferometric systems and three-dimensional vision systems. www.he-arc.ch

Yves Salvadé (Professor) was born on June 22, 1971. He obtained his master’s degree from the University of Neuchâtel in 1994 in the field of physical electronics. He obtained his PhD degree from the same university in 1999 on a thesis entitled “Absolute Distance Measurement by Multiple Wavelength Interferometry”. He worked at the Institute of Microtechnology of Neuchâtel (IMT, now part of EPFL) as Research Assistant from 1994 to 1999 and then Senior Scientist from 1999-2002. He worked then as optical engineer at Logitech Europe from 2002-2004. He is now professor at Haute Ecole ARC ingénierie since 2004 and at the head of the research group “Metrology and Industrial Vision”. Most of his research and development projects were carried out in close collaboration with industrial partners or with the European Southern Observatory from 2000-2004. His favourite fields of work are interferometry for absolute distance measurements, optical encoding technologies, and optical design.

Helia Photonics is specialized in demanding optical coatings for micro-optics and light emitting semiconductor devices. We are involved in a range of vacuum optical coating technologies and with a keen interest in reinvestment and research, plans to ensure a strong foothold at the forefront of high enabling high-power diode lasers and high-performance antireflection coatings. www.helia-photonics.com

John Sharp (Business Innovation Manager) graduated in Optoelectronics & Laser Engineering in 1994 & has since worked on laser/detector/EDFA design & fabrication technologies for the fibre optic components division at Hewlett Packard/Agilent Technologies before joining Helia Photonics. He has worked on a wide variety of optical thin film applications including AR/HR coatings from UV to FIR wavelengths, complex filters & patterned coatings using a range of PVD technologies. He is involved in a number of research projects for laser development, imaging, communications & sensing applications in a number of industries & is always interested in seeking new challenges that push the boundaries of thin film technology.

IRnova, based in Kista (Sweden), is an independent company serving the OEM high-end infrared detector market and related services. IRnova’s recent breakthrough in both 15µ pitch QWIP and HOT T2SL focal plane arrays spearheads the European research and development of IR sensors. With researchers pioneering the field of infrared, state of the art production facilities that serves challenging military requirements and an excellent track record, IRnova is the obvious choice as a reliable, long term supplier of high-quality detectors. www.irnova.se
Eric Costard (CTO) is a world-renowned expert in III-V materials manufacturing. He pioneered the research on QWIP Infrared sensor design and manufacturing, technology that is still today deployed in major European defense programs. As Technical Executive at IRnova since 2015, he pushed further QWIP technology boundaries with the first 15m pitch detector and simultaneously led the forefront of T2SL detectors manufacturing.

**iXblue**

iXblue, a French group with around 500 employees, is a leading global provider of innovative solutions and services for navigation, positioning, and imaging. Customers rely on iXblue systems, operations, and services for the challenges they face on sea, land, in air or in space. iXblue solutions encompass inertial navigation systems, photonic components and modules, acoustic positioning and sonar solutions, imaging systems, motion simulators, and stabilized platforms. The expanded team, fully dedicated to photonics, masters key technologies including fiber preform processing, fiber drawing, waveguide wafer processing, RF design and components packaging. The site based in Lannion is dedicated to fiber manufacturing and fiber components, while the second one located in Besancon, with 45 full-time employees, is in charge of integrated high-speed modulators, RF- and control electronics, and optoelectronics instrumentation. [www.ixblue.com](http://www.ixblue.com)

Jérôme Hauden (R&D Manager) received a Ph.D degree in Applied Physics in early 1995 from the University of Franche-Comté, Besancon, France for his work on integrated optics in lithium niobate for telecommunication networks. After a post-doctoral position at Ginzton Laboratory, Stanford University, CA, USA, working in nonlinear effects in lithium niobate waveguides, he joined the Optics Lab. of the University of Franche-Comté, France at the end of 1996. From 1998 to 2000, he worked as a posted researcher at Georgia-Tech Lorraine Laboratory, a CNRS -Atlanta University joint Lab in Metz, France. In September 2000, he founded Photline Technologies where he was in charge of Research and Technologies. At the end of 2014, when Photline merged with iXblue SAS to form the iXBlue Photonics System Division (PSD), he became R&D Manager.

**KLEO**

KLEO Connect is aiming to guide business customers to a future of global data-based applications, enabling them to empower their processes and develop completely new business models. Its innovative system architecture lays the foundation for a revolutionary connectivity network, allowing truly global machine-to-machine (M2M) broadband communications in real-time. Focus industries are Maritime, Aviation, Automotive, Mining & Construction, and Agriculture. [www.kleo-connect.com](http://www.kleo-connect.com)

Thomas Laurent (Director Business Development) has a background in Physical Chemistry and Ultrafast Laser Spectroscopy. He co-founded eagleyard Photonics, a high power laser diode maker, in 2002 and co-managed the company as its CTO. Thomas helped to establish the component manufacturer as a reliable commercial partner for various European and US based players in Space. Recently he moved towards NewSpace orbits, entering the race of deploying massive low-earth-orbit (LEO) satellite constellations. At KLEO Connect, a fast growing Munich/Berlin based company offering satellite communication services with low latency and global coverage, he’s in charge of generating business in key verticals.
**Lambda-X** offers services in optical engineering, from concept to production, in three space segments: Science Payloads for ISS or Sounding Rockets, Optical Payloads for Earth Observation, Metrology & Vision systems for Space exploration. Active since 1996, The company owns a background of more than 30 instruments, already deployed in Space. In parallel, Lambda-X develops a new metrology instrument, based on deflectometry technology, for mirrors characterization. [www.lambda-x.com](http://www.lambda-x.com)

Jean-Hervé Lecat (Business Developer) studied optics at Graduate School Institut d’Optique (France) and started to work at European Space Agency as VSNA. After 4 years at SOPRA as Product Line Responsible, he joined SPACEBEL, DMO and then CSL where he was Programme Manager of Advanced Technologies Department from 2007. He became part of Lambda-X team in 2018 as Business Developer.

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**LIGENTEC**

LIGENTEC is your manufacturing partner for Photonic Integrated Circuits (PIC). We provide next generation silicon photonics for customers in high-tech areas such as Communication, Quantum technologies, LiDAR and Sensing. LIGENTEC commercializes the all-nitride-core technology, with which LIGENTEC enables the customers to develop their products in the industrial revolution 4.0. [www.ligentec.com](http://www.ligentec.com)

Michael Geiselmann (Managing Director) studied physics and engineering at University Stuttgart and Ecole Centrale Paris. After his PhD at ICFO in Barcelona in 2014 he joined the laboratory of Prof. Kippenberg at EPFL in Lausanne, where he advanced frequency comb generation on integrated silicon nitride chips towards applications and was involved in several international research projects. In 2016, he co-founded LIGENTEC. At LIGENTEC, Michael is advancing the technology development of silicon nitride based integrated circuits and is looking for new business opportunities and is also overviewing technical sales and marketing.

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**Light Tec** offers optical design tools and optical engineering services. Light Tec’s team is made of 18 employees at 2 locations, one in Hyères (France) and one in Munich (Germany). The tools proposed include: Optical design software tools (Code V, LightTools, LucidShape, RSOFT) + technical support and training. Scattering measurement tools including the development and sales of industrial products (“Mini-Diff”, Mini-Diff VPro and “Reflet 180’’). With a high-skilled team of optical engineers, the company also offers consulting and measurement services. [www.lighttec.fr](http://www.lighttec.fr)

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EPIC Meeting on New Space
Yan Cornil (CEO) founded LightTec in 1999. He graduated from IOGS in 1984.

LUMIBIRD is one of the world's leading specialists in lasers. With 50 years of experience and expertise in 3 key technologies solid-state lasers, laser diodes and fiber lasers the group designs, manufactures and markets high performance lasers for the industrial (manufacturing, lidar sensors), scientific (laboratories and universities), medical (ophthalmology) and defense markets. LUMIBIRD (formerly Quantel-Keopsys group) is on the Euronext Stock Exchange and employs 400 people. With development and manufacturing facilities in France and the USA, and a strong world-wide sales and service network, the group serves a global customer base. www.lumibird.com

Patrick Maine (Lumibird Group CTO) is based in Quantel, les Ulis, France since 2009. From 1998 to 2008, he was CEO of Quantel USA (then Big Sky Laser Technologies) in Bozeman, MT, USA. From 1988 to 1998, he was R&D Manager at Quantel developing Solid-state lasers. Patrick was a scientist at LLE, University of Rochester, NY, USA, from 1985 to 1988, working on Chirped pulse Amplification lasers with Donna Strickland and Gérard Mourou (two 2018 Nobel Prize laureates in Physics). He graduated from Ecole Supérieure d’Optique (now IOGS) in Orsay, France, in 1984.

Luna Innovations is a leader in advanced lightwave measurement technologies, providing unique capabilities in high-performance test and characterization of fiber optic systems and integrated photonics, as well as solutions for distributed strain and temperature sensing. Luna’s award-winning products, including optical component analyzers and ultra-high resolution backscatter reflectometers, are used to accelerate the design and development of the photonic components and systems that are the building blocks of modern, high-speed communications networks. Whether in the lab or in production, Luna’s test systems provide fast and complete characterization of optical components and systems, delivering unprecedented visibility into the device’s insertion loss, return loss, polarization, dispersion, etc. For the aerospace, automotive and energy markets, Luna’s high-definition fiber optic sensing (HD-FOS) systems can accurately map strain and temperature profiles with sub-millimeter spatial resolution, using standard optical fiber. www.lunainc.com

Andreas Stern (Director of Sales) is Director of Sales for Europe Middle East and Africa in Luna Innovations. He has a background of over 30 years in the Test & Measurement Industry. Starting as Service Engineer, Global System Engineer, Technical Trainer, Product Manager and Director Business Development for various different T&M solutions, he experienced all areas of the advantages and challenges of testing product before bringing them to market. In Luna Inc., Andreas is responsible for their market leading Fiber Optic Test and Sensing Solutions in the EMEA region. Andreas is based in Germany and is holding a Dipl. Ing. (FH) in Communication Technologies.
LYNRED and its subsidiary US-based Lynred USA are global leaders in designing and manufacturing high quality infrared technologies for aerospace, defense and commercial markets. Their vast portfolio of infrared detectors covers the entire electromagnetic spectrum from near to very far infrared. The Group’s products are at the center of multiple military programs and applications. Its IR detectors are the key component of many top brands in commercial thermal imaging equipment sold across Europe, Asia and North America. The organization is the leading European manufacturer for IR detectors deployed in space. [www.lynred.com](http://www.lynred.com)

Mouro Labs S.L. provides solutions to remote sensing and imaging challenges through the use of coherent methods and integrated optics. The company is developing a new generation of low-cost LiDAR systems for automotive, industrial and aerospace applications that attains an unprecedented resolution and sensitivity. This proprietary technology is covered by three patent applications and the company is close to completing a first prototype proving the feasibility and advantages of its approach. Mouro Labs is currently opening discussions with strategic partners to take its innovation to key target markets from 2020. [www.mouro.tech](http://www.mouro.tech)

**Eduardo Margallo (CEO)** is Mouro Labs’ founder and CEO. He successfully launched MedLumics, a medical device company based in Madrid, Spain. As its chief executive during the period 2011-2017, he led the development of the first Optical Coherence Tomography technology platform based on integrated optics, took a class II diagnostic product to market and raised more than €40M in private and public funding. Dr. Margallo holds a PhD in biophotonics from TU Delft (NL), an MBA from Brown University (USA), and MSc level degrees in telecommunications engineering, physics and electrical engineering from Universidad Politécnica de Madrid (ES), Universidad Nacional de Educación a Distancia (ES) and Universität Stuttgart (DE).

**Gregory Pandraud (Founder)** received the Ph.D. degree in optics, optoelectronics from the University of Saint Etienne, Saint Étienne, France, in 1998. From 1999 to 2003, he was a Development Engineer with Bookham Technologies plc., U.K., and the Senior Design Manager with Opsitech S.A., France, where he developed integrated optical components for DWDM and next generation networks applications. He is with the Delft University of Technology since 2004, where after acting as Manager Processing within the Else Kooi Laboratory, he is now assistant professor in the Electrical Sustainable Energy department.
Nanovation is a French start-up: founded in 2001 which develops, produces and commercialises functionalised zinc oxide thin films and nanostructures. Zinc oxide is a multifunctional wide bandgap semiconductor with huge range of emerging applications from transparent conductors in solar cells, through gas/movement/light sensors, to thin film transistors for transparent electronic applications. 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. Dr. Rogers was later Project Manager of a cuprate superconductor start-up company based in Paris. In 2001, he co-founded Nanovation (www.nanovation.com), a French start-up specialised in the development, fabrication and commercialisation of oxide semiconductor epiwafers and nanostructures. Dr. Rogers is the author/co-author of 20 patents and over 100 publications. He is also an organiser and a regular invited speaker at numerous international conferences. In parallel with developing Nanovation, Dr. Rogers 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). He is currently an adjunct Professor at the University of Technology of Sydney.

NB-Photonics was established in 2010 as one of five Multidisciplinary Research Platforms (MRPs) in a Ghent University research policy plan for promoting excellence in research. These MRPs were selected by recognition of established expertise, multidisciplinary collaboration and potential to become world leaders. The NB-Photonics concept emerged due to several realizations. Our society is faced with important challenges, such as, qualitative and affordable healthcare, clean and renewable energy, and efficient ICT. Key Enabling Technologies (KETs) within photonics, nanotechnology, and biotechnology have the potential to help provide solutions. The intricate nature of the challenges at hand necessitates a multidisciplinary approach. NB-Photonics solves such challenges and provides training through our members’ expertise and their facilities in combination with academic and industry collaborating partners. www.nb-photonics.ugent.be

Gunther Roelkens (Professor) received a degree in electrical engineering from Ghent University, Belgium in 2002 and a PhD from the same university in 2007 at the Department of Information Technology (INTEC), where he is currently full professor. In 2008, he was a visiting scientist in IBM TJ Watson Research Center, New York. His research interest includes the heterogeneous integration of III-V semiconductors and other materials on top of silicon waveguide circuits and electronic/photonics co-integration. He was holder of an ERC starting grant (MIRACLE), to start up research in the field of mid-infrared photonic integrated circuits.
New Imaging Technologies is a French SME who is regarded as a pioneer in Wide Dynamic Range solutions in the field of sensor- and camera engineering. With over 15 years of academic research and patented technologies, NIT masters all the steps from the image sensor design to complete camera engineering and offer a complete portfolio of CMOS and InGaAs imaging sensors and cameras, embracing Visible, Intensified and SWIR markets. We operate in a large number of different industries, but most of our operations and applications of our image sensor and camera solutions are found in the fields of machine vision, defence, security, automotive and autonomous driving. Our core team of 25 full-time employees clusters experienced complementary metal-oxide-semiconductor designers, all recognized experts in their fields, with a multi-disciplinary group of optical, mechanical and electronic engineers. With sales partners in over 20 countries New Imaging Technologies is firmly established within the industry and widely present internationally. www.new-imaging-technologies.com

Simon Ferré (SWIR Sensor Engineer) holds a Diploma in Engineer from IMTA, France, an MSc degree from University of Waterloo, Canada, and a PhD degree in Physics from Université Paris VI, France. After 3 years of research on increasing the optical power of Quantum Cascade Lasers at Thales Research and Technologies and MirSense startup, he joined New Imaging Technologies in 2016. He drives the SWIR sensors production line and take part in the development of new products and features.

Materion Precision Optics is one of the world’s largest providers of precision thin film coatings and optical filters. With 40+ years of experience we have a thorough understanding of our customers’ needs and provide innovative solutions to meet their toughest challenges in markets ranging from Defense, Space, Astronomy, Commercial, Automotive and Thermal Imaging to Projection Display. Materion Precision Optics has delivered high performance filters to the space instrument community since the late 1970’s. We have filters and coatings in well over 100 flight instruments. Some well-known examples include: Hubble Space Telescope - three different imagers (WFP2, ACS & WFC3), Galileo 14 year mission to Jupiter - SSI camera onboard, Cameras (WAC & NAC) for the Imaging Science Subsystem on the Cassini Saturn mission, All post-Viking US Mars missions, NASA’s lunar mission (LRO), Multispectral arrays for Landsat, VIIRS, Developed filters for Earth imaging programs such as GeoEye, OrbView and Digital Globe where imagery is used by government agencies and commercial ventures, Multiple international missions (EU - GAIA, Sentinel 2, SLSTR and many others). www.materion.com

David Harrison (Business Development) has been a part of the Materion Precision Optics team (formerly Barr Associates) for over 30 years. His previous roles included optical design engineering, senior process engineering and program management. David has also collaborated on international programs, such as, JWST, MASTCAM, PROBA-V, SLSTR and Sentinel 2. David is currently the Business Development Manager for the Space & Astronomy group with a main concentration on multispectral arrays for space programs and 1M class optical components.
Ocean Insight reflects our evolution from one of many suppliers of spectroscopy products to a singular provider of Applied Spectral Knowledge. Our purpose is to help customers define pressing challenges and deliver answers that promote a safer, cleaner, healthier future. Ocean Optics invented the miniature spectrometer, pioneering the concept of bringing the measurement to the sample. Now, your changing needs have inspired us to embrace new ways of innovating, collaborating and problem-solving. As Ocean Insight, we bring application-specific expertise, services, and solutions to define and solve important challenges across multiple industries and disciplines. We invite you to explore our integrated approach to customer need. We call it Applied Spectral Knowledge (ASK) - innovative spectroscopy hardware, software, and on-demand data delivery backed by deep category expertise. More simply, we’re turning spectra into answers. www.oceaninsight.com

Evelien Huijs (Sales Engineer) has been working together with her colleagues for 3.5 years to provide a fitting spectroscopy setup for Ocean Insight’s customers within research departments of companies, institutes and universities. Together with the engineer or researcher, her team dives into the application to offer a matching solution. This can be a combination of their modular setups or a newly designed solution. Evelien’s background in physical chemistry on the lab helps her to understand the research environment and application, but every customer is experienced in their own field giving her and her team the opportunity to be educated every day and to implement their knowledge to find a solution for their (spectroscopy) challenges.

Optocap is owned by the Alter Technology Group TÜV Nord S.A.U. Optocap is a technology-oriented company active in the field of optoelectronics & microelectronics package design and assembly services with a focus on components for Space & high reliability terrestrial systems. Turn-key packaging services enable its customers to reduce development and manufacturing costs, accelerate time to market and reduce risk with new product developments. Optocap offers full design and assembly of custom Photonic products and is experienced in harsh environment applications, specifically the Space sector. Optocap also launched its new narrow linewidth frequency-stabilised laser product range in Q1 2019. www.wpo-altertechnology.com/optocap

Mark Day (Business Development Manager – Quantum Technologies) has interest in Quantum research and applications stemming over 18 years from his master’s and PhD research at University Leeds and from working with blue chip technology companies and new start high-tech companies. Mark has been working within BDM and sales & marketing managerial roles, providing cutting edge technologies covering a diverse range of applications to a worldwide audience. Mark’s PhD expertise involved a cutting-edge homebuilt femtosecond laser system for looking at electron transfer in DNA, then transitioning to industry dealing with academic, corporate accounts and stakeholders to promote and implement cutting edge technologies, such as photonics and laser-based solutions to a range of commercial and scientific markets. Mark has direct experience of the challenges organisations, academia and governments face in establishing new technologies and products in the marketplace.
OptoSigma offers a variety of products to address the demand of high-quality photonics components. OptoSigma Europe, a subsidiary of SIGMAKOKI, was established in Europe in early 2014 to provide support to our distributors and get closer to the European customers. Our group possesses more than 42 years of experience in manufacturing high quality optics, optomechanical components and optoelectronics systems. Thanks to the rich Japanese know-how we have cultivated over the years, high quality products at an affordable price are available for any customer. Our optics portfolio includes all kind of optics such as high power laser mirrors, beamsplitters, lenses, polarizers, filters among others. Our portfolio also includes a wide variety of opto-mechanics products to hold all kind of optics, as well as motorized and manual stages, optical tables and most of the building blocks for photonics applications. www.optosigma.com

Guy Ear (President & 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 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.

Mauro Persechino (Sales Engineer) was born in Rome on 14/11/1984. He started studying Physics at Sapienza University and got his master on quantum information and communication under the supervision of Prof. Paolo Mataloni in 2013 after quitting his (very short) football career. For one year, he worked as a Sales Engineer at Crisel Instruments. After that, Mauro started in 2014 his PhD in France (Paris) under the joint supervision of Prof. Philippe Grangier and Prof. Eleni Diamanti. He got his PhD on Quantum Cryptography in 2017. Then, Mauro continued for a six-month post-doc on the same project. After that, he started a one-year postdoc on combined Spectroscopy and Microscopy for Quantum Memories with Diana Serrano and Prof. Philippe Goldner. He left this project to join Optosigma as Regional Sales & Application Manager in April 2019.

PhotonDelta is a European network consisting of researchers, chip designers, foundries and software developers. Our goal is to develop a sustainable ecosystem that can have a significant impact on our customers, in future applications and in solving social and technological challenges. PhotonDelta provides the necessary access to a.o. networks, knowledge, business development and funding. www.photondelta.eu
Ewit Roos (CEO) is CEO of PhotonDelta Foundation since January 2019. His main responsibility is the realization of the goals in the National Plan Integrated Photonics, stimulate new activities and maintain intensive contact with companies and relevant industry for expanding the ecosystem. He was already Managing Director of PhotonDelta since 2016. Before this position, he was, as of 2011, Managing Director of BrightMove. Aside from his CEO role, Roos advises both national and regional governments and public bodies on early stage funding topics and is involved in several funding companies and initiatives. Roos started his career in with Waste Management Inc., where he became responsible for corporate affairs and business development in The Netherlands. After 6 years of corporate work, he started a new IT recycling activity in the Waste Management group.

PLX is a major innovator and leader in monolithic optics, providing countless solutions to fit the demands of a new generation of optical requirements for the Defense, Aerospace and Commercial industries. From a fabricator of conventional system optics to a system integrator, PLX provides high-quality optics that maintain their integrity and accuracy over time, as well as withstanding harsh operating conditions. PLX clients include some of the world’s leading space and defense contractors as well as laboratories around the world. PLX’s proprietary, Monolithic Optical Structure Technology (M.O.S.T.™), integrates complex optical elements into compact monolithic structures, achieving exceptional accuracy and stability under severe environmental conditions. PLX Inc. is located at 40 W. Jefryn Blvd. Deer Park, NY 11729 USA. www.plxinc.com

Itai Vishnia (CEO) is a 25-year veteran of PLX. Itai has been responsible for the introduction of such PLX innovations as upgrading Telescope Alignment in space, modernized Boresighting military technology, state-of-the-art interferometers and the Monolithic Optical Structure Technology (M.O.S.T.™). A prolific inventor, Itai holds 27 optical patents and has authored numerous technical papers. Itai’s modernizing PLX’s production and quality control departments has resulted in supplier awards from several of the world’s leading defense contractors, as well as the U.S. Small Business Administration Region II Small Business of the Year Award. Itai holds an opto-mechanical engineering degree from Technion I.I.T. in Israel where he also worked for a high-tech company, directing the design and development of highly accurate laser technologies. He is a veteran of the Israeli Defense Force, where he commanded and supervised a team involved in Optoelectronics repair both in the lab and in the field.

Quantum Design Europe is part of Quantum Design international and we are a leading European distributor of high-quality scientific instruments and components. We offer components and systems used in materials science, imaging, spectroscopy, photonics, nanotechnology and life science research. We were founded over 45 years ago and employ more than 120 dedicated staff across Europe. www.qd-europe.com
Stephane Struyve (Benelux Area Manager) received his Master in Applied Physics in 1992 at the University of Ghent in Belgium. After many years in IT, Stephane switched to science and technology in 2011. Since then, Stephane worked for Quantum Design Europe in the Benelux and enjoyed working with clients to find the correct solution for their application. His core competencies include scientific imaging and spectroscopy and 3D Raman Confocal Imaging. He also has some knowledge about AFM and X-Ray techniques like XRF, XAS, EXAFS, XANES.

QuiX is a startup company specializing in the fabrication of silicon nitride photonic processors. QuiX was founded in January 2019 by a team of academics from the University of Twente and investors. QuiX delivers large, low-loss tunable photonic interferometers for quantum information processing applications across a large range of wavelengths.

Jelmer Renema (CTO) is the CTO and co-founder of QuiX. He has been involved in quantum technology for a decade, starting with his PhD research on superconducting nanowire detectors, followed by postdoctoral research into quantum simulation and integrated quantum photonics at the University of Oxford. Now, Jelmer is affiliated with the University of Twente.

Quside Technologies designs and manufacture quantum components for all connected devices. Using our proprietary quantum random number generator, we are enabling the transition to future-proven encryption solutions, enhancing cybersecurity across any device. The Quside team specializes in the development of scalable quantum components for the cybersecurity and computing markets, making use of photonic technologies, photonic integrated circuit technologies and electronics. www.quside.com

Domenico Tulli (Co-founder and CTO) got a PhD in Photonics from ICFO and the MSc in Telecommunications from Università di Bologna. He oversees the strategic technology development of the company. Domenico brings to Quside over 10 years of experience in design and fabrication of photonic components on multiple platforms. Prior to his current position, he was the Device team leader at DAS Photonics, where he developed advanced components for space and telecom/defence applications. He had been the principal investigator in several EU funded (FP7, H2020) projects and had also served as an independent expert. Tulli has published over 30 papers in international journals and conferences; and holds one patent.
RISE Research Institutes of Sweden, Acreo is one of the leading research institutes in Europe within the fields of electronics, optics, communication techniques and sensor systems. We facilitate commercialization of research and collaborate with industry and academic partners. Types of assignments range from feasibility studies, long term research projects, prototyping, small scale production and verification/testing. One particular focus is Fiber Optics, where the R&D resources include fiber optic sensing and specialty optical fibers. www.ri.se

Qin Wang (Senior Expert) received her Ph.D. degree in solid state physics at Lund University in Sweden in 1999. Now, she is a senior expert and project manager at RISE Acreo working on high performance optoelectronic devices for imaging and optical communication (free-space or fiber based) applications. She has had joint projects with Swedish industrial and academic partners, and was also involved in several European projects, for example, Q-switch, Labels, Odin, Iphobac, Sandra and Technet nano projects, CAMART2, and C3PO. She is the author or co-author of more than 100 papers. She is a board Member of IEEE Photonics Sweden.

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Rosenberger is an ESCC qualified manufacturer and fulfils the high requirements on manufacturing, assembling, quality assurance, and testing which are mandatory for reliable suppliers to the space industry. In addition to our ESCC-qualified product portfolio we also develop customer specific cable assemblies and solutions to meet individual requirements. Rosenberger has achieved „Space Heritage“ in recent years by participating in various space missions with different requirement profiles. www.rosenberger.com

Alexandra Henniger-Ludwig (Head of Team Active Optics) studied Electrical Engineering and Information Technology at the University of Karlsruhe, Germany (now KIT). After the Diploma Degree in 2008, she worked at the German Aerospace Centre (DLR) and Institute of Photonics and Quantum Electronics (IPQ) of the Karlsruhe Institute of Technology (KIT) as research assistant towards the Ph.D. in 2015 with the title “Stacked Modulation Formats enabling highest-sensitivity optical free-space links”. Since 2014, she is with Rosenberger Hochfrequenztechnik GmbH & Co. KG as head of active optics team.

The SAES Group is a world leader in a variety of scientific and industrial applications where high/ultra-high vacuum conditions or pure metal vapors or ultra-pure gases are required. Starting in 2004 the Group has expanded its business into knowledge-intensive materials markets, in particular the market of NiTiNOL, whose super elastic properties are applied to medical devices while shape memory properties are applied in industrial and consumer electronics applications. For more than 70 years, our technology has been supporting innovation in the following sectors: Information and Displays industry,
Lamp industry, Vacuum and Ultra-high Vacuum applications, Vacuum tubes and electronic devices industry, Ultra-high gas purification for Semiconductors, Renewable Energies area. Since 2004 our NiTi smart materials solutions have been innovating: the Medical devices industry, the Consumer electronics industry, the Automotive industry, the White Goods and Domotic industries. The Group is also developing a wide range of advanced polymer-matrix composite materials for the encapsulation of OLED Displays, OLED Light Sources and other Organic Electronics and Organic Photonics devices.

www.saesgroup.com

Marco Moraja (MEMS Business Manager) joined SAES getters as Project Engineer in R&D corporate laboratories after graduating in Electronics in 1994 at the Polytechnic University of Milano. In 1998, he took the responsibility of the Vacuum system laboratory and introducing getter film for MEMS applications. From 2004, he is managing getter for MEMS Business Area. He is consolidating worldwide activities for Inertial sensors and IR applications. He has direct contact with the major worldwide MEMS makers and participates to co-development work for MEMS vacuum packaging. He authored and co-authored more than 20 technical and scientific papers together being inventor or co-inventor of more than 10 international patents, most of them directly related to MEMS applications.

Schott Primoceler helps our customers develop, manufacture and test hermetically sealed products. Our experience started in the medical device industry, where SCHOTT Primoceler’s novel glass-to-glass bonding method solved issues in hermetic sealing of medical implants. From there, we worked with the Aerospace industry, where the advantages of our Glass Micro Bonding were verified and continuously tested. Furthermore, SCHOTT Primoceler offers manufacturing services. Quality assurance is at the center of all our processes and we have a wide range of expertise in hermeticity testing and reliability assurance. We can address even the most stringent demands.

www.schott.com/primoceler

Ville Hevonkorpi (CEO) is one of the founding members at Schott Primoceler. He has been developing hermetic room temperature glass bonding methods. He studied microsystems technology at Tampere University of Technology. After his studies, development has been focused on high reliability packaging for opto-electronics and for aerospace and medical implant devices. Mr. Hevonkorpi has been leading various successful projects with the European Space Agency where high-reliability glass packaging for space applications have been developed. At the moment, Hevonkorpi and his team are frequent speakers at international microelectronics and medical implant packaging conferences.

Space Inventor, of Aalborg, Denmark, was founded in 2015. Space Inventor has focused on designing, building and testing a variety of avionics products in order to meet the need for professional, industrialized nanosatellites that meet a minimum of a five-year life span. Space Inventor uses a modular approach that allows for components to be interchangeable between micro- and nanosatellites. Space Inventor understands the need for customization when developing individual missions; therefore, they also provide engineering services for custom development and mission design. Space Inventor strives to provide fast solutions with the highest quality and performance to meet each client’s mission needs.

www.space-inventor.com
Fatemeh Jessen-Hansen (Optical Engineer) is an optical engineer at Space Inventor ApS where she started in January 2019. She is the technical lead on the development of an optical laser communication downlink device for micro and nano satellites. Before Space Inventor, Fatemeh worked on electronics and RF antenna systems for nanosatellites at GomSpace in Denmark, where she has flight heritage with different products currently in space. Her background with two masters; one in natural science in astronomy and one in engineering in optics & electronics and a research studentship as a support astronomer at the Nordic Optical Telescope, gives her a broad view on development. Fatemeh has passion for space and developing new ideas.

SpaceTech is a privately-owned company and independent from large aerospace companies. Located in Immenstaad, Germany, on the shore of Lake Constance, we are ideally situated in the centre of a high tech area together with several other aerospace companies and have access to a strong network of experienced suppliers. Founded in 2004, STI has developed into an established and well recognized medium size enterprise in the space industry with currently close to 100 employees. STI offers a wide spectrum of products and services focusing on science and Earth observation space missions. Our main capability is the design, development, and manufacturing of innovative, high quality space equipment. Our products in particular include; Small satellite system design, production, and integration; Solar generators, satellite structures, deployment mechanisms, electronics; Laser-optical instruments and components, ICARUS Systems. www.spacetech-i.com

Hanjo Schäfer (Project Manager) studied physics in Stuttgart and Konstanz. He did his diploma thesis and a Ph.D. in the field of ultrafast optical laser spectroscopy of condensed matter. After two years of post-doctoral research activities, he became an employee at the Spacetech GmbH. Beginning in the laser ranging instrument project, he later became the head of the AIT (assembly, integration and test) department. Meanwhile, he is the project leader of the optical absolute frequency reference unit that is being built for the German/French climate mission satellite ‘MERLIN’, the project leader of the absolute frequency reference for the EU lidar project LEMON and the deputy of the mission success department.
Technobis group is a developer and supplier of high-tech instruments and modules for OEM companies around the world. Technobis tft-fos is specialized in the development and supply of fibre optic sensing systems and applications. All developments are spectrometry and or interferometry based. Starting with free-space optics 17 years ago, nowadays all new developments are based on integrated photonics. Application Specific Photonic Integrated Circuits: ASPICs allow custom and highly dedicated system designs for a versatile range of improved performance requirements. Technobis ipps is a specialized solution provider for ASPIC packaging by supplying dedicated and mid-range volume packaging services. As ASPIC packaging requires complex dedication, our key values are thermal: and mechanical stability, high performance, low-noise, low power consumption, easy but versatile integration, reliable and repeatable quality. Technobis mechatronics is specialized in carrying out complete product development projects, going from an idea to a successful turnkey product, prototype or series product. www.technobis.nl

Pim Kat (CEO) started his career at Sun Electric systems in 1982, developing automotive testing equipment. In 1987, he moved to Hoogovens Research where he worked as researcher for 9 years. In 1996, he co-founded the company BIHCA Systems as part of the HIT group. In 2003, this company became Technobis and eventually Technobis group in 2006. After developing the state-of-the-art Fibre Bragg Grating interrogator on a free space optics basis, Technobis joined the Jeppix-Paradigm program and started to experiment with ASPIC designs for FBG sensing solutions. This resulted in diverse ASPICS for various fields of use mostly based on InP but also making use of SOI and TriPlex technology. At this moment, developments on ASPICS are executed in the field of nano-strain sensing, impact detection, damage detection in composites, shape reconstruction, Eigen mode monitoring. As packagers for industrial series of ASPICS are hard to find, Technobis started to develop and produce their own packaging solutions for the ASPICS and is setting up a packaging facility.

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

Peter Harmsma (Scientist Nanophotonics) has experience in InP, SOI, dielectric waveguides (TriPleX) and polymer photonics. Key interests are in sensor applications in waveguide optics, (bio) chemical sensing by means of ring resonators, and spectroscopy on chip for medical and space applications. He is also involved in QuTech, the quantum institute of the Delft University and TNO, and, as such, is exploring the potential of integrated optics in quantum technology. Peter received his PhD from the Delft University in 2000 on the monolithic integration of active and passive components in InP.
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](http://www.toptica.com)

**Thomas Renner (CSO & Member of the Executive Board)** joined TOPTICA Photonics in 2005 and is responsible for sales, marketing and product management. Before that, he was Director Innovation & Marketing at Rofin/Baasel Lasertech. He got his PhD on Ultrafast Physics at the University of Munich in 1995 and has a great passion for “looking with lasers” - both in academia and industrial applications.

TOPTICA Projects, a subsidiary of TOPTICA Photonics AG, has been founded in 2016. TOPTICA Projects focusses on customized laser solutions, innovation and technology development. This includes all activities related to the award-winning sodium guide star lasers used by several major astronomy facilities worldwide and recently selected for ESO’s next generation Extremely Large Telescope (ELT). The TOPTICA team has recently received the OSA Forman-Award for the guide star laser. [www.toptica-projects.com](http://www.toptica-projects.com)

**Frank Lison (CEO and Co-founder)** graduated in 1994 from Leibniz University in Hannover and received a PhD in Physics from Bonn University. Frank started his career at Bayer AG and moved in 2002 to TOPTICA Photonics AG as VP of Research & Development. In 2009, he became CEO of TILL Photonics GmbH. When TILL Photonics was bought by FEI Inc. in 2011, he stayed as managing director of FEI Munich GmbH. He was responsible for the worldwide cell and tissue biology business at FEI until he left in the beginning of 2014. Thereafter, he has been working as an independent consultant in the Photonics Industry focusing mainly on startups. Since October 2016, he is CEO of TOPTICA Projects GmbH.

UniKLasers is a UK-based expert in CW Single Frequency DPSS lasers with a focus on mid to high output power. UniKLasers designs & manufactures single frequency lasers in a wide range of wavelengths for holography (red, green & blue), high precision metrology, Brillouin imaging, Raman spectroscopy, confocal microscopy, semiconductor quality inspection and other high precision applications. Lasers have excellent parameters and are particularly suited for applications that require high wavelength and output power stability. UniKLasers is an active player on the Quantum Technologies market. The Company has a growing range of Single Frequency DPSS lasers for Quantum applications, particularly for Commercial Optical Lattice clocks and Quantum Gravitometer, such as 780.24, 698.4 and 689.4nm lasers. [www.uniklasers.com](http://www.uniklasers.com)
Mark Mackenzie (Senior R&D Engineer) graduated from Heriot Watt University in 2016 after completing a PhD in Ultrafast Laser Inscription and Microfluidic Devices. He then spent two years as a research assistant developing near- and mid-IR supercontinuum sources. He joined UniKLasers in 2018 as a Senior R&D Engineer and has been involved in the production of single frequency lasers at visible and near-IR wavelengths.

VIGO Ventures is an investment group with a strong focus on photonics and hardware projects. We invest in the seed/pre round A stage and provide business and technological support. One of our strategic partners is VIGO System (www.vigo.com.pl) a joint stock company and a global leader in production of high operating temperature IR detectors. VIGO System supplies unique products, manufactured with the use of internally developed technology and the aid of its 120+ team. Our second strategic partner is Warsaw Equity Group (http://warsawequity.com) a privately held investment company with over 20 years track record of successfully supporting business ventures and entrepreneurial DNA. As we are a part of a larger ecosystem, we offer long term support for our portfolio companies which includes possible next round financing. www.vigo.ventures

vario-optics, founded in 2009 as a spinoff of the well-known Varioprint AG, with location in Heiden (Switzerland) is a leading supplier of Electro Optical Circuit Boards (EOCB). With this new technology, vario-optics ag has made significant investments, not only in the product technology but also in the development of the production process technology and the necessary infrastructure. The products are sold globally, to all major markets, such as telecom, industry, medical, automotive, military and aerospace. www.vario-optics.ch

Felix Betschon (CEO) received his master’s degree in electrical engineering at Swiss Federal Institute of Technology, Zurich (ETHZ) in 1996. He then worked as research assistant at ETHZ where he received his PhD in 2001. From 2001 – 2007 he held different positions within the R&D organization of Oerlikon ESEC, at the end as Head of R&D. From 2007 to 2008, he was responsible for the electronics development department of Presta ThyssenKrupp in Budapest. In 2008, he joined Varioprint AG where he spun-off the electro-optical circuit board activities into the independent company vario-optics ag. He has CEO of this company since then.
**VPIphotonics** provides professional simulation software and design services for optical component and subsystem manufacturers, as well as system and network integrators. VPIphotonics offers a suite of software environments supporting design, analysis and optimization of applications for integrated photonics, optoelectronics, fiber optics, transmission systems and networks. VPI’s off-the-shelf and customized solutions are valued for their powerful and comprehensive simulation capabilities and high degree of flexibility. They are applied in research and development, product design and marketing by hundreds of companies, and for teaching and research at over 160 academic institutions worldwide.

www.VPIphotonics.com

**André Richter (General Manager)** is an expert with 20+ years of experience in the field of optical communications and photonics. He received his M.Sc. degree from Georgia Tech, USA and Ph.D. from TU Berlin, Germany. André co-authored 100+ publications and contributed to 15+ international R&D projects. Being with the VPIphotonics team since 1997, André generated numerous novelties in industry research and education, commercialization and market development. He held management positions with responsibilities for technical services, product management, research & development before being appointed as General Manager in 2013.

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The **ZEISS Group** develops and distributes semiconductor manufacturing equipment, measuring technology, microscopes, medical technology, eyeglass lenses, movie and camera lenses, binoculars and planetarium technology. It emerged from a workshop for precision mechanics and optics which was established by company founder Carl Zeiss in the east German city of Jena in 1846. ZEISS gained a lot of experience during the last tens of years by developing and manufacturing outstanding optics and optical gratings e.g for ambitious space applications. In addition, ZEISS offers spectrometers from UV to NIR range utilizing high quality diffractive gratings with very low stray light. The fabrication of the optical gratings uses holographic exposure systems or ultra-high-precision ruling engines. The benefit of holographically produced gratings is their high diffraction efficiency, even with high groove frequencies. Mechanically ruled ZEISS gratings distinguish by particularly uniform groove spacing. This ensures that spectrometers have high detection sensitivity, even for low-intensity signals and provide increased measurement accuracy in the visible and infrared ranges. In addition to the standard portfolio of gratings, ZEISS also produces customized gratings (from spherical to free-form surfaces), allowing custom specific solutions for users in space applications, spectroscopy and laser technology.

www.zeiss.com

**Tim Rathje (Project Manager)** is the Project Manager for development projects for space flight gratings at Carl Zeiss Spectroscopy GmbH, Jena. He received his Diploma in Physics from the Friedrich-Schiller University Jena. During his Ph.D. research Dr. Rathje studied the interaction of ultra-short intense laser pulses with molecules at the Institute of Optics and Quantum Electronics, Jena. With over 10 years’ experience in applied optics, Dr Rathje’s industry experience covers development projects in the optic, semiconductor and laser fields.
Zemax began delivering optical software and services to help engineers, scientists, researchers, and students bring their ideas into reality. For more than 26 years, we’ve remained true to the vision of our founder Dr. Ken Moore: to offer a rock-solid physics architecture, to uphold a culture of excellence and innovation, and to always listen to our customers. Zemax software helps companies get to a qualified design quickly by streamlining the workflow and communication between optical and mechanical engineers. Zemax Virtual Prototyping tools include OpticStudio®, the industry-leading optical design software, and LensMechanix®, the powerful SOLIDWORKS® Certified Gold Partner add-in for optomechanical development. OpticStudio and LensMechanix use the same physics core relied on by NASA and industry leaders to analyze and validate complete product designs. In addition to unmatched software value, we offer comprehensive technical support and introductory, advanced, and customized training. Our global team serves customers in English, Japanese, Taiwanese, Chinese, German, French, Italian, and Spanish. With headquarters in the Seattle area and offices in the UK, Japan, Taiwan, and China, we’re proud to have the most passionate, worldwide user base in the industry. www.zemax.com

Alessandra Croce (Senior Optical Engineer) received her BSc in Physics from the University of Palermo, and her MSc in Applied Physics with a major in Optics & Photonics from Université Pierre et Marie Curie, Paris. Following her MSc, she has worked as a Test Engineer and Project Engineer for Beck Optronic Solutions, an optical design and manufacturing company based in the UK. In 2015 she has joined Zemax, where she is currently working as a Senior Optical Engineer, focusing on researching new modelling capabilities, creating technical content and coordinating work for upcoming OpticStudio features.

Christophe Weisse (Sales Engineer) graduated from Institut d’Optique in 2002 and have worked in various environments – 3D modelling, optical quality control, sales engineering, lighting design, photography. Christophe enjoys a lot learning about new applications, solving problems and find creative solutions.
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