

Miniaturized Photonic Packaging

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Dr. Alexander Steinecker

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Alexander Steinecker is Business Development Manager at CSEM. He is physicist and received the degree Dr. rer. nat. from the University of Bonn. Since 2001 he is with CSEM. His expertise is project management in robotics and packaging. He has experience in international collaborations and coordination of large scale projects. In his current position he is matching CSEM's technologies with industrial needs.

Labtour



Dr. – Ing. Stefan Mohrdiek

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Stefan Mohrdiek is heading the packaging & optics activities at CSEM SA. The main focus of his work is on supervising programs and establishing new research platforms in microelectronics, enabling/targeting innovative packaging solutions and aligning the research strategy with industry needs and the company's existing research areas.

He received the master degree in electrical engineering with emphasis on communications engineering at the Technical University Darmstadt (Germany) in 1990. The PhD in Optoelectronics he obtained working at the Deutsche Telekom Technology and Research Center in Darmstadt in 1995 within the department of opto-electronic components as guest from the Technical University Hamburg-Harburg. The PhD was followed by a fellowship granted by the European Union at the Technical University Tampere in Finland in the semiconductor laboratories, working on multinational programs in semiconductor physics and technology.

When moving to Switzerland in 1998 he joined the semiconductor industry, developing applications for packaged semiconductor lasers. After 15 years he started at CSEM SA in 2013 with an overall experience of more than 20 years in the field of optoelectronics and packaging, about 50 scientific publications and a number of patents.

Moderation

Welcome from CSEM SA and Swiss Photonic Packaging Laboratory (SPPL)



Dr. Christian Bosshard

Manager Swissphotonics, Vice-President Center MuttENZ, CSEM SA, 4132 MuttENZ BL
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Dr. Christian Bosshard is Vice-President of the CSEM Center in MuttENZ. He received his degree in Physics (1986) and his doctorate (1991, Silver medal award) from ETH. Christian Bosshard is a Fellow of the Optical Society of America (OSA), coordinator for CSEM in the Heterogeneous Technology Alliance (HTA), Managing Director and board member of Swissphotonics.

Welcome from Swissphotonics, the National Thematic Network (NTN) for Photonics



Roger Schelbert

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Since 2004 -
Manager BU, Credimex AG,
Robotics & Vision Systems
Innovationleader CresaSolution, CresaLine
Board Member, Credimex AG, MGB Projects
2000 - 2004 Zietromec AG, Industrial Electronics
1991 – 2000 ESEC SA; Cham/ZG, Manager Testing/R&D

Welcome from Credimex AG
Presentation of Credimex AG with Products and Services



Dr. Bastian Rheingans

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Bastian Rheingans received his engineering diploma in Materials Science in 2009. Working afterwards at the Max Planck Institute for Metals Research and at the Institute for Materials Science of the University of Stuttgart, he received his PhD in 2014. In 2016, he joined the Laboratory for Joining Technologies and Corrosion at Empa, Swiss Federal Laboratories for Materials Testing and Research.

Development of reactive joining technologies for electronic packaging and assembly
Utilising reactive nano-multilayers as a local heat source for soldering opens up new possibilities for benign, and fast, joining of microelectronic components. In this talk, the basic principles of the reactive joining process will be outlined. Typical challenges encountered upon reactive joining and solutions will be addressed, and current and potential future applications will be presented.



Dr. Mark Fretz

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Mark is a senior R&D research engineer and project manager at CSEM SA and has been a member of the Packaging group since November 2012. Previously, Mark worked for Implant Systems, NICTA, in Australia from 2009 to 2012. He received his Diploma in Physics from the ETH in 2005 and a PhD in Science from the University of Neuchâtel in 2009.

Miniaturized hermetic packages in glass and sapphire
Miniaturization of hermetic photonic systems poses challenges to packaging. In particular, components have to be protected from excessive heat during sealing and stresses have to be minimized. Both challenges have been addressed by CSEM'S proprietary laser assisted bonding process. The process is compatible with sapphire and glass materials i.e. allowing for optical and RF transparency of the packages.



Johannes Kremmel

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Johannes Kremmel received his engineer diploma from the Interstate University of Applied Sciences Buchs NTB in 2005. In 2010, he received his master's degree in optical systems technology from the University of Applied Sciences Weingarten, Germany. Since 2006, he has worked at the Institute MNT of the NTB. His current research interests include optical interconnects, optical simulations and packaging of optical systems.

Passively aligned fiber-coupling of planar integrated waveguides
We demonstrated an approach for passively aligned multi-channel fiber coupling of integrated optical circuits. The approach is based on micro-machined silicon elements with V-grooves which hold the fibers and provide alignment features. The alignment interface of the integrated system provides corresponding structures to guide the silicon element into place. We demonstrated this approach for 8 channels.



Dr. Bert Jan Offrein

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Bert Offrein is a principal research staff member at IBM Research. He contributed to several projects such as adaptive integrated optical technology for DWDM networks, silicon photonics and optical interconnect technologies. Since 2016, he is leading the neuromorphic devices and systems group, addressing cognitive hardware for accelerating neural network learning. Bert Offrein is the co-author of over 150 publications and the co-inventor of more than 35 patents.

Scalable electro-optical packaging of silicon photonics components

Electro-optical integration at chip- and system-level provides a path to overcome the relatively high cost of optical interconnects. Advanced chip-level integration technology will be discussed, monolithically combining CMOS electronics with silicon photonic and Indium-Phosphide structures. Furthermore, efficient and broadband fiber-to-chip coupling method will be presented for large channel count and high bandwidth system-level optical interconnects.



Michael Huber

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Michael Huber received his joint master's degree in optical system engineering from the University of Applied Sciences NTB Buchs and the University of Ravensburg-Weingarten in 2014. He has been working for Fisba AG since 2008 and is heading the R&D group for Advanced Optical Components. With his team he is focusing on design and manufacturability of optical components with glass molding processes.

Collimation Optics for Laser Diodes: Novelties and Assemblies

Laser diodes require tailored optics for beam shaping to make the light usable. Laser diode arrays or single emitters require fast and slow axis optical collimation. With increasing requirements different engineering solutions exist. By using novel production and assembling technologies it is possible that approaches which were considered too expensive for mass production become available to broad application fields.



Dr. Pietro Bernasconi

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Pietro Bernasconi received his PhD title in Physics from ETH in 1998 before joining the Bell Laboratories (USA) as a researcher in the Photonics Integration Group and later in the Optical Networking Group. In 2012 he returned to Switzerland as a R&D engineer at Diamond SA. Dr. Bernasconi is also a member of the IEC international standardization commission.

Fiber Bragg gratings integrated into fiber optic connector (OLiD)

Some optical sensors can be packaged within conventional fiber connectors to be used as local temperature or stress sensors or for monitoring purposes in small/large optical networks. The package must guarantee the sensor's full optical functionality but must also provide mechanical compatibility with the surroundings, which may require submicron manufacturing and positioning accuracy.



Dr. Christoph S. Harder

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Dr. Christoph S. Harder received the ETH Diploma in 1979 and the Master and PhD in EE in 1980 and 1983 from Caltech, Pasadena, USA. He is cofounder of the IBM Zurich Laser Diode Enterprise which pioneered the first 980nm high power pump laser for telecom optical amplifiers and laser diodes for industrial and consumer applications with ultrahigh reliability. He is the recipient of a Fulbright scholarship and the OSA Fellow recognition.

Christoph is now heading a consulting company and is cofounder of Swissphotonics NTN and has been its president for the last few years.

He has published more than 100 papers and 20 patents and has held a variety of staff and management positions at ETH, Caltech, IBM, Uniphase, JDS Uniphase, Nortel and Bookham and has volunteered on society boards and committees.

**Chair
Gap Closure Discussion**



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