

Connectors for Advanced Fiber Systems

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Dr. Matteo Castiglioni

Director of Sales and Marketing, Diamond SA

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1997 – 2002 Master degree in Management and Production engineering, Politecnico di Milano and ETH

2010 – present Diamond SA, Switzerland
as of 2011 appointed Director of Sales and Marketing with power of attorney

2008 – 2010 itema weaving, Italy: Group Product Manager of weaving machines

Welcome and Introduction of Diamond SA

Diamond is a worldwide leader in supplying high precision fiber optic solutions and has been serving successfully several markets for over 30 years. Also Diamond is known as a dynamic and innovative company, able to develop reliable, customized components and equipment, in response to the increasingly demanding customer requirements. In addition to Diamond's headquarters, established in Switzerland in 1958, Diamond can count on an extensive international distribution network with 5 subsidiaries and over 20 representatives. In the past optical fibers were used primarily in the data and telecom industries, but new research has resulted in many new applications for fiber optic components. These applications cover markets such as: Bio-Medical, Measurement Instruments, Laser Delivery, Sensing. The presentation will focus on Diamond's offers among these new challenging markets.



Dr. Christoph Harder

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Dr. Christoph S. Harder received the Electrical Engineering Diploma from the ETH in 1979 and the Master and PhD in Electrical Engineering in 1980 and 1983 from Caltech, Pasadena, USA. He is co-founder of the IBM Zurich Laser Diode Enterprise which pioneered the first 980nm high power pump laser for telecom optical amplifiers. He has been managing during the last few years the high power laser diode R&D effort in Zurich expanding, working closely with a multitude of customers, the product range into 14xx pumps as well as 808 and 9xx multimode pumps for industrial applications. 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.

Moderation and Introduction of Swissphotronics



Prof. Dr. Valerio Romano

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Valerio Romano received his PhD degree in 1991 from the University of Bern. His research topics are special optical fibers and laser-materials interaction. He is Professor for Applied Photonics at the Bern University of Applied Sciences and Lecturer as well as research group leader at the University of Bern. With Swissphotronics, he is coordinator of the National Fiber Lab (SNFL) and board member.

Introduction and Presentation of Program

During the last two decades optical fibers have continuously grown into innumerable new photonic application fields ranging from sensing, beam delivery, optical filtering to light generation and amplification, just to name a few. Many of these developments rely on the advent of novel special fiber concepts such as microstructured optical fibers. This workshop wants to stimulate the discussion around the chances and challenges of implementing *all in fiber* concepts by interconnecting different types of fibers and systems.



Dr. Nicolai Granzow

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After graduating in physics from University of Erlangen in 2009, Nicolai Granzow joined the group of Philip Russell at the Max Planck Institute for the Science of Light, where he worked on supercontinuum generation and photonic crystal fibers. He received his PhD in 2013. Having gained experience in scientific sales in the laser safety market, he joined NKT Photonics as sales engineer in April 2014.

Photonic Crystal Fiber: Technology, Termination and Examples of Industrial Usage

Due to their unique optical characteristics, photonic crystal fibers (PCF) have become a powerful technology in both science and industry. In my presentation, I will provide an introduction to the essential physics of PCF and focus on a variety of different applications based on PCF, in particular supercontinuum / white light lasers.



Alexandre Paduch

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Alexandre Paduch is a research and development engineer within the Hexagon Technology Center GmbH since 2006. As an optical fiber and interferometry expert within the Photonics Group, he develops and transfers into manufacturing new products for the Hexagon group, which includes amongst others the companies Leica Geosystems, Brown & Sharpe, DEA, Leitz and Tesa.

Usage of Fiber Optics in Metrology

The 3D shape metrology industry is increasing and requires steadily faster and non-contact measurements. Today, coordinate measurement machines (CMM) acquire the 3D shape of objects by touching the sample. The newly launched HP-O technology solution offers pure optical shaping capabilities based on interferometric distance measurement through optical fibers.

Dr. Ulrich Dürr

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Professor in Physics (Uni. Stuttgart); Head of research & development for industrial/medical Laser systems (Lasag); CEO Meridian Medical Lasers; VP (Haag-Streit): Head of Applikation & Innovation (Lasag); President (Meridian); Project Manager (Lasag)

All in Fiber Systems

With fiber lasers it is in principle possible today to offer *all in fiber* laser systems for material processing or medical applications. The challenge is to guide and control the high power laser beam with low losses and with high mode stability to the processing head and at the same time to optimize the beam by beam shaping technologies for processing. If possible fiber coupling should be avoided because of the well known problems with free beam optics and coupling. Such a *all in fiber* system also needs innovative solutions with respect to service and *plug & play* capability in production environment.



Prof. Dr. Fabien Sorin

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Prof. Fabien Sorin graduated with a PhD from the Massachusetts Institute of Technology (MIT) in Cambridge, USA, in 2008. After working as a research scientist at MIT, he joined the company Saint-Gobain as a research engineer in France in 2011. Since 2013, he is an assistant professor in the Institute of Materials (IMX) at EPFL, where he founded the *Laboratoire des Fibres et Matériaux Photoniques* FIMAP.

Recent development in specialty multi-material fibres

The fabrication techniques of optical fibres are progressing rapidly. Novel materials and structures can now be integrated, which enables optical fibres to exhibit unprecedented functionalities. In this talk I will present recent developments in fibre materials and fibre integrated functionalities. The perspectives and challenges of specialty multi-material fibres will be presented and discussed.



Prof. Dr. Luc Thévenaz

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Professor at the Swiss Federal Institute of Technology (EPFL) since September, 2008. At EPFL on different postdoctoral positions since 1988.

Research in fibre optics and optical signal processing for the development of new frontiers in sensing and communications. Leading one of the major groups in the world on distributed fibre optics sensors and a pioneer group in laser diode spectroscopy. Pioneer and specialist about slow & fast light in optical fibres. Management of a total of 34 research projects, supported by Swiss national agencies, the European Union, the European Space Agency and companies. Teaching of modern optics for students in Electrical Engineering (2 lectures) Supervisor of 12 completed PhD theses and currently Director of 3 PhD students.

Ultra-high spatial resolution in distributed fibre sensing

The field of distributed fibre sensing has tremendously developed in the past decade, reaching resolutions that were simply not conceivable some years ago. Sub-centimeter spatial resolution could be recently obtained over several kilometers of fibre, offering the possibility to analyze the internal structure of devices. The principles of modern distributed sensing will be presented and illustrated by examples.



Prof. Dr. Markus Michler

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1996 - 2001 PhD in physics (quantum optics): Vienna University
1998 - 2006 Research assistant and group leader photonics at the Institute for Micro- and Nanotechnology of NTB (Interstaatliche Hochschule für Technik Buchs)

Since 2006 Professor for physics and optics at NTB
Main interests: Fiber- and waveguide optics, MOEMS, optical packaging, optical coatings
Lecturer: Bachelor Systemtechnik NTB: Physics and MEMS courses
MSE-Master: Applied Photonics
Master OS: Micro-and integrated optics

Connecting Integrated Optical Systems to Fibers – Novel Connectors for Future Applications

The success of integrated planar waveguide systems or waveguide based sensing devices is closely related to the systems compatibility to coupling fibers. A proper matching of mode fields and numerical apertures as well as high precision fiber to waveguide alignment are essential for low loss coupling. Standard fiber connectors often cannot fulfil the manifold requirements claimed by the customers. What are the challenges for next generation fiber to waveguide connectors?



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