Photonics 4 Luxury Coatings

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Dr. Patrik Hoffmann

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Adjunct Professor at The Laboratory for Photonic Materials and Characterization (LPMAT), Swiss Federal Institute of Technology Lausanne, EPFL, Switzerland
Chemistry studies at University of Karlsruhe, PhD thesis at EPFL in 1992. Industrial experience at IBM San Jose (USA) and manager of dental section in company (Germany). Since 1997 research and teaching Laser Micro-Processing at EPFL. Since April 2009 heading LAMP at Empa, continuing teaching at EPFL. Author of 111 peer reviewed journal papers and inventor of 6 patents.

Moderation

Dr. Christoph S. Harder

President Swissphotonics NTN, 8832 Wollerau SZ
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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 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.

Introduction Swiss Photonics – presentation of organization

Dr. Andreas Bächli

Head Business Unit Optical Coating, RhySearch, 9471 Buchs SG
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After a Physics degree (ETH, 1988) and a subsequent PhD (University of Bern, 1992), Andreas Bächli worked two years as research fellow at Caltech, Pasadena, before joining BALZERS AG in 1995. During the following 20 years he gained extensive experience in thin films, focusing on optical and PV-coatings. Since November 2016 he heads the Business Unit Optical Coatings at RhySearch.

Optical Coatings
Many technologies today would not be possible without Optical Coatings. In this introductory presentation we outline basic theory of optical interference coatings and give an overview of thin film production. A variety of applications enabled by Optical Coatings are shown, as well as challenges that still need to be addressed in this fields.

Dr. Florian Bourgeois

R&D Project Manager, Comelec SA, 2301 La-Chaux-de-Fonds NE
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Dr. Florian Bourgeois holds a PhD in Materials Science from the University of Grenoble. He previously worked at CEA-Leti and ULIS as R&D process engineer in the field of infrared detectors. He is now specialised in vacuum coatings technologies and responsible for the R&D at Comelec SA since 3 years. Its activities focus on both materials development and equipment designs.

Medical Coatings
Comelec SA is a swiss company, leader in Parylene Coating. Parylene is a conformal polymer coating deposited from a vacuum process. It benefits from a unique synergy of outstanding material properties (barrier properties, chemical stability, insulating properties, etc…) and process advantages (near 100% conformal on 3D shapes, room temperature process). Current process developments aim to bring new multi-functional coatings to medical devices.

Prof. Dr. Christophe Vallée

Professor at Grenoble Alpes university,
Laboratoire des Technologies de la Microélectronique (LTM), CEA-LETI, 38054 Grenoble F
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Dr. Christophe Vallée is Professor at the Grenoble Alpes University and his current research at LTM is focused on the deposition by plasma assisted processes (PECVD and PEALD) and characterization of thin films for microelectronic devices. He is currently leading a joint laboratory between LTM and STMicroelectronics.

Atomic Layer Deposition
Atomic Layer Deposition (ALD) is forecasted to be the fastest growing segment in thin film deposition equipment market for the next years. It is recognized as the technique offering the greatest potential for depositing high quality material on 3D substrates where conformality is crucial. This conference will address the basics of ALD: what is ALD, key merits, reactors, and applications.

Dipl. Ing. Alois Wiesböck

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Nov. 2016 – today, Ocean Optics BV, Account Manager Industry
Oct. 2011 –Oct. 2016, Laser 2000, Sales (Instrumentation), from Feb. 2015 Sales Group Manager
Dec. 2007 – Sep. 2011, EQ Photonics, Sales (Acousto-Optics)
Apr. 2007 – Sept. 2007, Max Planck Institut für Plasmaphysik, Diploma thesis
Oct. 2003 – Sept. 2007, Munich university of applied sciences, Engineering Physics

Optical Characterisation of Coatings
A Thin Film Reflectometry System allows to analyze the thickness of optical layers from 1 nm to 250 µm. You can observe a single thickness with a resolution of 0.1 nm and analyze single-layer or multilayer films in less than one second. It is suitable for applications in a variety of semiconductor, medical and industrial applications.

Prof. Dr. Beat Neuenschwander

Expert for MicroNano Technologies of the Swiss Commission for Technology and Innovation CTI and Professor at Bern University of Applied Sciences BUAS, 3400 Burgdorf BE
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Dr. Beat Neuenschwander studied physics at the University of Bern and realized 1996 his PhD at the Institute of Applied Physics. Since 2000 he is at the BUAS where he built up the laboratory for laser micro machining and laser surface engineering. He lectures physics and applied laser technology, is member of CTI and head of the optics section of the Swiss Society for Optics and Microscopy SSOM.

Ultra-Short laser Pulses: A Versatile Tool for Applications in Watch-Industry and Jewelry
Ultra-short pulse laser systems today are turn-key systems with several 10W of average power for industrial 24/7 applications. Due to the very short pulse duration machining with highest quality and precision becomes possible and by optimizing process parameters and machining strategy also high throughput and short machining times can be achieved. We will introduce some general rules for micro-processing with ultrashort pulses and show interesting applications like surface structuring / coloring and de-coating. Based on experiments we will also present the influence of factors like heat accumulation, shielding-effects and cavity-formation which may reduce the machining quality and limit the scale-up process to even higher throughput.

Dr. Ralph Delmdahl

Product Marketing Manager, Coherent LaserSystems GmbH & Co. KG, 37079 Göttingen, D
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Dr. Ralph Delmdahl is Product Marketing Manager for the Excimer Business Unit of Coherent in Göttingen since December 2007. Dr. Delmdahl has over 15 years of experience in the laser industry. He holds a PhD in Physical Chemistry from the Technical University of Braunschweig and a Diploma in Chemistry from the University of Frankfurt am Main.

Flexible Smartphone – Laser Challenge
As the structural dimensions of microelectronics components continuously shrink, there is a trend towards employing short wavelength UV-lasers delivering highest machining resolution both along lateral and vertical direction. The combination of modern excimer lasers with large-field projection optics bridges the gap between fast processing and precise processing. Excimer lasers enable the flexible future of smartphone displays and other electronic devices.

Prof. Dr. Frank R. Wagner

Associate Professor at Aix-Marseille Université / Institut Fresnel, 13013 Marseille, F
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Dr. Frank Wagner obtained his MSc degree in Physics in 1997 at the University of Göttingen, Germany. He then did his PhD in 2000 at the EPFL. Thereafter he developed the water-jet guided laser as R&D Engineer at Synova SA until 2004. Finally, he joined the Light Matter Interaction group of the Institut Fresnel in Marseille, where he does research on laser-induced damage in optical materials.

Nanosecond laser induced damage in nonlinear optical crystals
Nonlinear optical crystals are key components in many modern optical instruments enabling frequency conversion, Q-switching etc. These devices need high optical powers to operate efficiently and are thus subject to laser-induced damage. The comprehension of laser induced damage in these materials allows an improved instrument design for long reliable operation, for example in space applications.

Michael Duka

Sales Director – DACH & South Eastern Europe, SPI Lasers UK Ltd, UK
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Dipl.-Phys. Michael Duka
Physics, TU Munich, degree 1989
over 25 years in sales of lasers/optoelektronics
sales of usp lasers with Quantronix
sales manager laser marking systems with BAASEL Lasertech
since 2003 with SPI Lasers
Sales Director – Central & South Eastern Europe

Laser Nanosecond welding of dissimilar metals and foils
Laser welding is a well established process in industrial material processing, typically performed by CW or long pulsed mostly solid state lasers whereas ns-pulsed lasers are mostly used in marking, engraving and micro-machining. SPI Lasers have developed a novel welding process based on their G4 series ns-pulsed fiber lasers with nearly perfect control over the heat flow, allowing even joining of dissimilar and high reflective metals.

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Workshop
- Talks by Photonics experts
- Partnering & Networking

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