3d Laser Printers and Printing

Tuesday, 25.11.2014, St. Gallen

Dr. Christoph S. Harder

President Swissphotonics, Wollerau SZ
harder@swissphotonics.net | www.swissphotonics.net

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.

Welcome

Prof. Dr. Konrad Wegener

ETH IWF, Zürich
wegener@iwf.mavt.ethz.ch| www.inspire.ch

After an academic career at TU Braunschweig and TU Darmstadt, and with more than 13 years in leading positions in the industry, Konrad Wegener became head of the Institute of Manufacturing and Machine tools at ETH in 2003. He is also the leading professor at Inspire AG, a technology transfer center at ETH. Research areas at the institute include machine tools, machining processes, simulation and additive manufacturing.

Photonics in manufacturing & 3D-Printing
Photonics covers a broad range in the field of manufacturing. At IWF and Inspire, laser processes are a focus in many research works. The presentation will give an overview about the various field of laser applications and presents activities in laser ablation, laser cladding and additive manufacturing.

Oliver Müllerschön

Leitung Branchenmanagement Surface Treatment, Trumpf, Ditzingen, Germany
Oliver.Muellerschoen@de.trumpf.com| www.trumpf-laser.com

Oliver Müllerschön received his state certified engineer degree 1994 in Stuttgart.
He started his carrier in the R&D department of Trumpf in Germany. He worked for several years in the sales department of Trumpf Laser Technology as a manager for CO_2 and Solid State high power lasers. From 2007 to 2012 he was the Senior Manager of the Industry Management Automotive Powertrain and currently he is responsible for the Industry Management Laser Systems & Surface Treatment Solutions at Trumpf Laser- und Systemtechnik GmbH.

Product and Application Solutions for Additive Manufacturing
By means of laser cladding, also known as laser metal deposition (LMD), a deposit material in powder form is inserted directly into a melt pool formed by a laser beam. This technology can be used for the production of coatings, as joining technology or as additive manufacturing process. In the field of additive manufacturing, deposition rates up to ca. 200 cubic centimeters an hour can be obtained. Additionally, deposition on existing 3D structures is feasible, making it possible to combine conventional processing methods (casting, forming a. o.) with laser based additive processes. An overview from the point of view of a laser and machine supplier on additive manufacturing technologies, focusing on LMD, will be given.

Dr. Thomas Peters

Oerlikon Metco Management AG, Winterthur ZH
Thomas.Peters@oerlikon.com| www.oerlikon.com

In 2001, Thomas Peters became responsible for the Laser Surface Engineering Group at Sulzer Innotec in Winterthur and transformed the former research operation into a profit center for Laser Cladding services. In 2008 he became head of the Production and Engineering department and member of the Innotec management team. In 2011, he joined Sulzer Metco, today Oerlikon Metco, to develop Laser Cladding as a Metco coating technology.

Laser Cladding at Oerlikon Metco
Oerlikon Metco is active in Laser Cladding for 25 years and offers Laser Cladding services, Laser Cladding materials and Laser Cladding equipment today. The presentation will link Laser Cladding applications from gas turbine component repair to demanding wear- and corrosion-resistant coatings in general industry to the related Laser Cladding materials and equipment.

Niklaus Keel

CEO TB-Safety GmbH, Frick AG
nik.keel@tbsafety.ch| www.tbsafety.ch

Establishment of the company in 1993. Development of blowers for the nuclear market and products for nuclear power plants. From 2003 development of new products for the pharmaceutical market with significantly increasing sales. In 2010 change to corporate name TB-Safety GmbH. International exhibition activities, development of the newest blower generation VenIon/VenPipe in the last two years, patents and establishment of an own suit production.

Design-Prototype-Serie: Development of a breathing unit
Interaction between research and industry — from the idea to serial production
Is it possible to produce highly complex and functional parts additively and to perform tests in practice?

Adriaan B. Spierings

Manager R&D Selective Laser Melting (SLM), Inspire AG, 9014 St.Gallen
spierings@inspire.ethz.ch| www.inspire.ch/irpd

Adriaan Spierings has a background in lightweight engineering and business administration. After a position in business development and project controlling, he joined Empa as a project manager. In 2005 he joined IRPD to build up the metal additive manufacturing side and since 2008 he leads the R&D group on SLM.

Additive manufactruring @ IWF-Inspire – Research & Applications
Inspire-IRPD has now been active in additive manufacturing (AM) since 18 years, shaping AM in an international context. The operational model of R&D and additive production enables Inspire to cover the whole process chain from materials to AM-processes, applications and machine structures. The talk will give an overview on current AM-activities within Inspire, covering processes such as SLS, SLM and DMD.

Prof. Dr. Michael de Wild

Institute for Medical and Analytical Technologies, School of Life Sciences, FHNW, Muttenz BL
michael.dewild@fhnw.ch| www.fhnw.ch/lifesciences

Michael de Wild is a professor at the University of Applied Sciences Northwestern Switzerland (FHNW). He studied physics at the University of Basel and the University of Utrecht, the Netherlands. Later he joined Endress+Hauser AG. After his PhD in the group of Prof. Dr. H.-J. Güntherodt at the University of Basel, he became a research scientist at Straumann AG.

3D manufacturing of implants made of titanium alloy
In this presentation, the design, manufacturing and testing of titanium and titanium alloy load-bearing implants produced by selective laser melting will be discussed. Analytical, structural, mechanical, in-silico, in-vitro and in-vivo studies are indispensable to verify the performance of such novel biomaterials. In particular the results from 3D-printed shape memory implants will be presented.

Dr. Eric Boillat

Laboratory for Production Management and Processes (LGPP), EPFL, Lausanne VD
eric.boillat@epfl.ch| www.epfl.ch

Dr. Eric Boillat graduated from EPFL in 1988 (physics engineer) and got his PhD in 1992 from the same school (applied mathematics). After a one year post-doctoral stay in Finland, he joined the LGPP at EPFL.
He is now in charge of a research group in the domain of selective laser sintering/melting of metallic powders. He is teaching lectures about production processes (traditional and non-traditional) at the bachelor and master levels for students in mechanics, micro-mechanics and material science.

From Remy Glardon's lab
At the research level, EPFL focuses on powder based processes and mainly on SLS(M) for metal or ceramic powders. The main research topics are process control, process simulation/modeling and material development.
The main goals are to increase the productivity and the reliability of the process and to improve or at least to maintain the part quality at the level it has now.
The targeted applications are mostly in the domain of micro-mechanics and watch making industry. Of course, medical applications as well as traditional mould and tool making technologies are also considered.

Prof. Dr. Valerio Romano

Professor for Applied Photonics, Berne University of Applied Sciences BFH-TI, Burgdorf BE
romano@swissphotonics.net| www.swissphotonics.net

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 Swissphotonics, he is coordinator of the National Fiber Lab (SNFL) and board member.

Workshop: 3-d printers and requirements on Laser sources

Josef Stirnimann

Dipl. Masch. Ing. ETH, Leiter Mikro-Fertigung, Inspire AG
stirnimann@inspire.ethz.ch | www.inspire.ethz.ch

Josef Stirnimann get his master degree in mechanical engineering at the ETH in 1982 and has been working for over 30 years in the fields of sensor, measuring and laser technique in swiss companies. In 2008 he joined Inspire AG where he is the head of the micro processing research group, where laser, EDM and chipping processes are investigated.

Workshop: Material and scanstrategy requirements for succesful additive manufacturing

SWISS PHOTONICS

Managing director
Dr. Christian Bosshard
bosshard@swissphotonics.net
Telefon +41 61 690 60 40

President
Dr. Christoph S. Harder
harder@swissphotonics.net
Telefon +41 79 219 90 51

Internet
www.swissphotonics.net