

13th SSOM Engelberg Lectures on Optics



Christoph Harder
President Swisslaser
March 16, 2009
Swisslaser.Net

SSOM Engelberg meetings

- 1985 Faser-Lichtleiter und integrierte Optik
- 1987 Messen und Optik
- 1989 Lasertechnologie - LASICS
- 1991 Rund um die Mikroskopie
- 1993 Licht und Materie
- 1994 Optical metrology and nanotechnology
- 1995 Messen mit Licht
- 1996 Free space micro-optical systems
- 1997 Bildgebende optische Messtechnik
- 1998 Optical spectral analysis microsystems
- 1999 Biomedizinische Optik

SSOM Engelberg Lectures

EOS Topical Meeting



SSOM Engelberg meetings

- 2000 Nanoscale Optics
- 2001 Optical Communication
- 2002 Organic Optoelectronics: Application and Devices
- 2003 Laser and Laser Applications
- 2004 Optics in Computing
- 2005 Biomedical Photonics
- 2006 Molecular Plasmonic Devices
- 2007 Photonics in Space
- 2008 -

2009 Industrial Photonics

Organized by: SSOM and Swisslaser

- 2010 Advanced imaging
- SSOM Engelberg Lectures
- EOS Topical Meeting

Industrial Photonics

13th SSOM Engelberg Lectures on Optics
16-19 March 2009, Hotel Regina Titlis, Engelberg, Switzerland

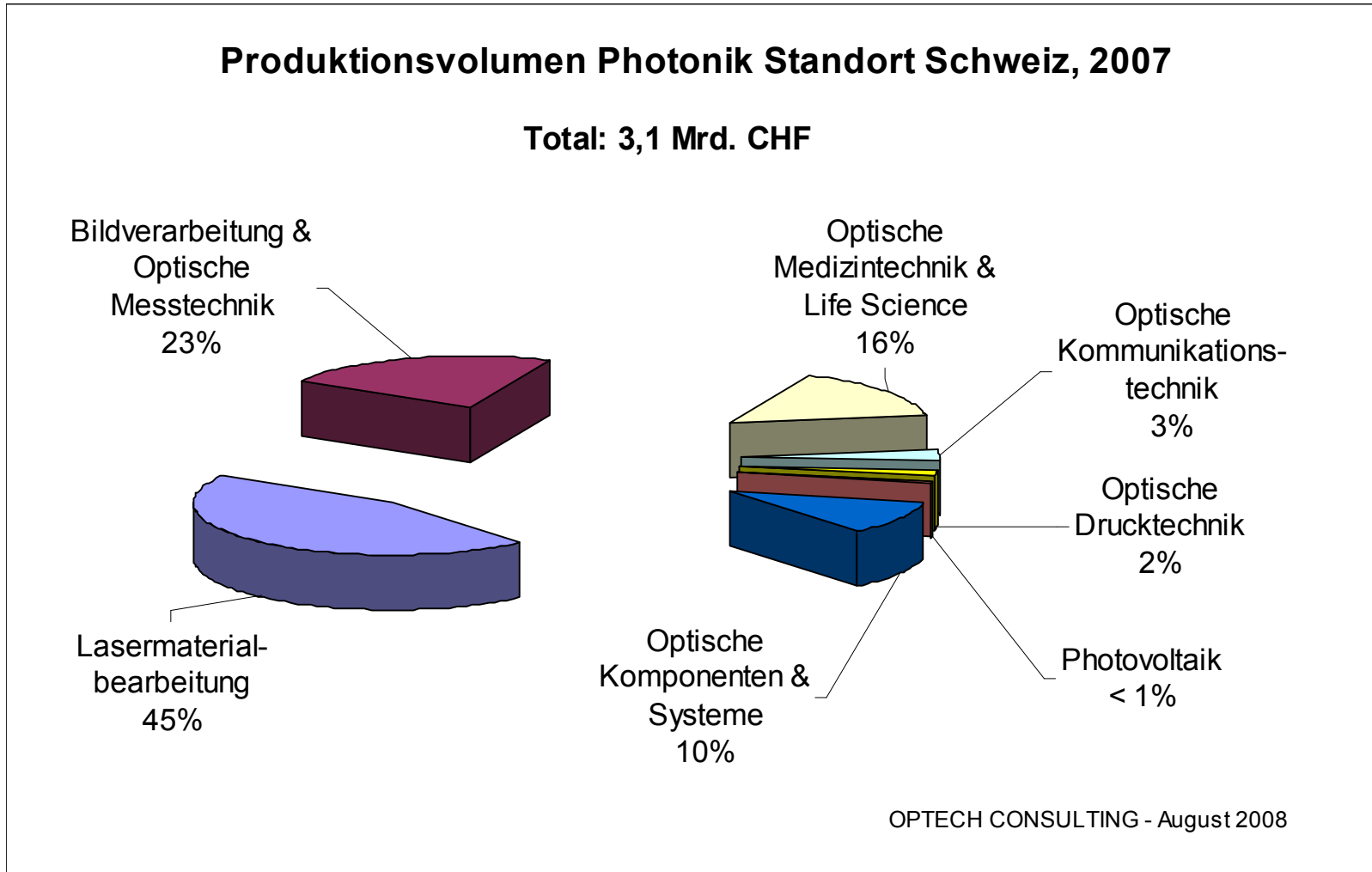
Organised by: Swiss Society for Optics and Microscopy SSOM
SwissLaser Net SLN

Co-sponsored by : European Optical Society EOS
Swiss Academy of Engineering Sciences SATW

Organisation Committee: Beat Neuenschwander, Hans Peter Herzig, Christoph Harder

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Swiss Photonics Industry



Swiss Photonik Industry

Produktionsvolumen in der Schweiz

1000 Mio. CHF und höher				Lasermaterialbearbeitung
500 Mio. CHF bis 900 Mio. CHF			Bildverarbeitung & Messtechnik	
100 Mio. CHF bis 400 Mio. CHF	Kommunikationstechnik	Optische Komponenten & Systeme	Medizintechnik & Life Science	
90 Mio. CHF und geringer	alle anderen Bereiche		Drucktechnik	
	geringer als 2%	2% bis 4%	5% bis 19%	20% und höher

Anteil an der Produktion in Europa

OPTECH CONSULTING - August 2008

Swiss Photonic Industry:

Market	Power Photonics Sources&Processing		Sensing	Telco Dataco Active&Passive		Lighting	Photo voltaic
Submarket	Beam Tool Cutting Welding Printing	Marking Medical	Basic Visible IR 3d TOF	Activ	Passive	Processing- Equipment Raw Material	Processing- Equipment
Companies	Bookham Bystronic Daetwyler Fisba Lasag Leister Oerlikon One-Five	Lüscher Silitec Synova Laser Auto. Tm-Bandwidth Trumpf WZW Soudronic	Alpes Vectronix Bookham Colibrys Exalos Mesa Leister Roche-Diag.	Bookham Albis Diamond Fischer Huber& Suhner Beam Express	ID- quantique Lemo IBM Varioprint	Ciba Ilford (Marley) Oerlikon Epispeed	Meyer- Burger Oerlikon Flisom Fluxim Solterra Swiss wafers VHS Tech.
Institutes	Inspire UniBern hti Burgdorf Fhsg ST.G	EPFL UniGenf ETH	CSEM EPFL ETH	CSEM ETH	EPFL UniGenf	EMPA CSEM ETH EPFL	EMPA ETH CSEM EPFL

Life Science Photonics

Monday Evening, March 16, 2009

	Topic	Referent	
17:30 – 17:40	Introduction to SSOM Engelberg Lectures	Dr. Christoph Harder	SwissLaser Net SLN
17:40 – 18:30	Introduction to Biomedical Imaging	Prof. Martin Frenz	IAP, University of Bern
18:30 – 19:20	Optical Coherence Tomography – Missing Link in Medical Imaging	Prof. Rainer Leitgeb	Biomedical Optics Group Medical University of Vienna
19:20 – 20:00	Introduction to Multiphoton Laser Scanning Microscopy	Dr. Markus Kohler	Carl Zeiss AG
20:00	Dinner		

Tuesday Morning, March 17, 2009

	Topic	Referent	
08:00 – 08:50	Functional Elements for Integrated THz Applications	Prof. Thomas Feurer	IAP, University of Bern
08:50 – 09:20	Optical Biosensors - Concepts and Applications of different optical readouts	Dr. Christoph Stamm	Zurich University of Applied Sciences zhaw
09:20 – 10:10	Optical detection and tracking of single unlabeled viruses	Dr. Philippe Kukura	Laboratory of Physical Chemistry, ETH Zürich
10:10 – 10:30	Coffee Break		
10:30 – 11:10	Optical detection for Microarray Imaging - More information from less sample	Dr. Markus Ehrat	Zeptosens – A Division of Bayer (Schweiz) AG
11:10 – 11:35	OCT: Techniques, History, State of the art	Dipl. Phys. Christoph Meier	Bern University of Applied Sciences
11:35 – 12:00	Laser Tissue Soldering	Serge Bogni	IAP, University of Bern
12:00	Lunch		

Photonic Tools

Tuesday Evening, March 17, 2009

	Topic	Referent	
18:00 – 19:00	The Fiber Laser as a Photonic Tool: Basics, State of the Art, Perspectives	Dr. Valerio Romano	IAP, University of Bern
19:00 – 20:00	Direct Diode: Trends and Limits	Dr. Christoph Harder	SwissLaser Net SLN
20:00	Dinner		

Wednesday Morning, March 18, 2009

	Topic	Referent	
08:00 – 08:50	Pulse energy scaling of femtosecond ultrafast thin-disk laser oscillators towards the 100- μ J level	Prof. Ursula Keller	Institute of Quantum Electronics, ETH Zürich
08:50 – 09:40	Beam Shaping for Industrial Laser Sources	Prof. Thomas Graf	Institut für Strahlwerkzeuge University of Stuttgart
09:40 – 10:10	Vertical cavity lasers for spectroscopy	Dr. Alexei Sirbu	Institute of Quantum Electronics and Photonics, EPFL
10:10 – 10:30	Coffee Break		
10:30 – 11:00	Precision Requirements in Optical Assembly	Jörg Pierer	CSEM Alpnach
11:00 – 11:30	UV-LED curing in industrial printing	Fritz Bircher	Bern University of Applied Sciences
11:30 – 12:00	Optoelectronic Simulation of Light-emitting and Light-harvesting Thin Film Devices	Dr. Daniele Rezzonico	FLUXiM AG Feusisberg
12:00	Lunch		

Photonic Manufacturing

Wednesday Evening, March 18, 2009

	Topic	Referent	
18:00 – 19:00	Materialbearbeitung im industriellen Umfeld	Dr. Bruno Frei	LASAG AG Thun
19:00 – 20:00	System- und Anlagentechnik für die Laserbasierte Fertigung	Dr. Rudolf Weber	Institut für Strahlwerkzeuge University of Stuttgart
20:00	Dinner		

Thursday Morning, March 19, 2009

	Topic	Referent	
08:00 – 08:50	Strahlführung und Prozessgrundlagen beim Bohren mit Laser	Andreas Michalowski	Institut für Strahlwerkzeuge University of Stuttgart
08:50 – 09:40	Laser Assisted Generation of Tribological Surfaces	Dr. Gabriel Dumitru	inspire ETH Zürich
09:40 – 10:10	Applications of ps-laser machining	Dr. Konstantins Jefimovs	EMPA Dübendorf
10:10 – 10:30	Coffee Break		
10:30 – 11:00	High Throughput Structuring: Basics, limitations and needs	Dr. Beat Neuenschwander	Bern University of Applied Sciences
11:00 – 11:20	Laser Dressing of Tools	Silvan Roth	IWF, ETH Zürich
11:20 – 11:40	Novel UV Laser Micro-machining	Karl Böhlen	CREALAS AG
11:40 – 12:00	Industrial applications of a fibre-based picosecond laser	Colin Moorhouse	COHERENT
12:00	Lunch		

Goal: Collaboration

- Transferkolleg
 - Bring projects to closure (CTI Project, Stop, Redirect)
- Start projects together, Swisslaser Focus:
 - Grüne, energieeffiziente Photonik
 - Direkte Dioden Strahlquellen
 - Faser Laser
 - Effiziente CO2 Laser
 - Photovoltaik
 - Nationales Laser Applikationslabor
 - Micro Bearbeitung: Schwerpunkt bei BFH/FHNW
 - Macro/RPT: Schwerpunkt bei Inspire/ETH
 - Gesundheit
 - Life Science Photonics
 - Optische Sensorik
- Swisslaser Net: Swiss Photonic Network