

Convention Program
Optical Technologies for Measurement
and Analysis



LASER OPTICS BERLIN

International Trade Fair and Convention
for Optical & Laser Technologies

17–19 March 2008
New: Berlin Exhibition Grounds

www.laser-optics-berlin.de

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Preface

Dr. Annette Schavan, MdB
Federal Minister
of Education and Research



The use of light in technology has long become an integral part of modern life – be it in the early detection and combat of life-threatening diseases, the optimization of quality assurance in production processes, or the low-energy lighting of whole surfaces by means of flexible organic light-emitting diodes (OLEDs).

Optical technologies are pace-setters for modern economies and societies. They generate important innovations in areas such as mechanical and automotive engineering, aircraft construction, shipbuilding, micro-electronics, lighting, and the pharmaceuticals and medical devices industries, all areas in which Germany has core competencies.

Optical technologies are a dynamic sector with enormous growth potential. A study recently published by the Federal Ministry of Education and Research shows that in 2005 alone, the sales volume generated by optical technologies in Germany amounted to 16.3 billion. Companies operating in the optical technologies sector in Germany predict a growth rate of 8.5% per year in the next ten years. At present, approximately 105,000 people are employed in this sector, a figure that is expected to rise to 143,000 by 2015.

We want to take full advantage of the potential of optical technologies. That is why this field is a priority in our High-Tech Strategy for Germany. Our aim is to reduce the time it takes for ideas to be turned into new, marketable products, processes and services. We want Germany to become the most innovative and research-intensive country in the world by 2020. In order to achieve this goal, we are encouraging close strategic cooperation between policy-makers, the scientific community and the private sector. Many of the lighting innovations that are being shown at the Laser Optics Berlin trade fair are the result of these collaborations.

I am confident that Laser Optics Berlin 2008 will be successful and hope that all visitors will have productive conversations, make useful business contacts, and go home richer in interesting experiences.

A handwritten signature in black ink, which appears to read "Annette Schavan". The signature is written in a cursive, flowing style.

Dr. Annette Schavan, MdB
Federal Minister of Education and Research

Plenary speakers



Ursula Keller

Ultrafast lasers: hitting harder, faster and broader
*Institute for Quantum Electronics, ETH Zurich,
Zurich, Switzerland*



Philip Russell

Photonic crystal fibres: Light in a tight space
*Max-Planck-Forschungsgruppe and Universität
Erlangen*

Invited speakers include



Frans J.M. Harren

**Laser based infrared spectroscopy for sensitive
chemical sensing**
*Life Science Trace Gas Facility, Radboud University
Nijmegen, Netherlands*



Harald Telle

Femtosecond lasers as metrological tools
*Physikalisch-Technische Bundesanstalt,
Braunschweig*



Alfred Vogel

**Nanoeffects in cells and tissues produced by
femtosecond and nanosecond laser pulses**
Medical Laser Center, University of Lübeck



Joachim Wagner

**Large tuning range quantum cascade laser
modules for the detection of hazardous substances**
*Fraunhofer Institute for Applied Solid State
Research, Freiburg*

Monday, March 17, 2008

Opening session

- 9:00 Welcome and Opening of Laser Optics Berlin
- 9:30 **Plenary talk**
Ultrafast lasers: hitting harder, faster and broader
Ursula Keller
Institute for Quantum Electronics, ETH Zurich, Zurich, Switzerland
- 10:30 Break

Session: Ultrashort pulses

- 10:50 **290-fs pulses from an optically pumped semiconductor disk laser (invited talk)**
P. Klopp, F. Saas, U. Griebner, M. Zorn, M. Weyers
Max-Born-Institute and Ferdinand-Braun-Institute, Berlin
- 11:20 **Passive mode-locking of novel Yb-doped tungstate crystals**
S. Rivier, A. Schmidt, V. Petrov, U. Griebner, D. Rytz, A. Garcia-Cortés, J.M. Cano-Torres, M.D. Serrano, C. Cascales, C. Zaldo
Max-Born-Institute, Berlin; FEE GmbH, Idar-Oberstein; Instituto de Ciencia de Materiales, Madrid, Spain
- 11:40 **Few-cycle pulse interactions in quadratic photonic crystals with the dispersion management**
V.E. Lobanov, V.A. Chernykh, A.P. Sukhorukov
Faculty of Physics, Lomonosov Moscow State University, Moscow, Russia
- 12:00 **High fidelity ultrashort-pulse transfer with spatial light modulators**
M. Bock, S. Kumar Das, R. Grunwald, S. Osten, P. Staudt, G. Stibenz
Max-Born-Institute, Berlin; HoloEye Photonics AG, Berlin; APE GmbH, Berlin
- 12:20 **Plasma x-ray source for femtosecond pulses**
M. Haschke, M. Bargheer, W. Mathis, A. Günther, W. Mackowiak, F. Tretner, F. Oesker
Institute for Scientific Instruments GmbH, Berlin; Max-Born-Institute, Berlin; Feinmechanik Teltow GmbH, Teltow
- 12:40 Break

Session: Applications of ultrashort pulses

- 14:30 **Femtosecond lasers as metrological tools (invited talk)**
Harald Telle
Physikalisch-Technische Bundesanstalt, Braunschweig
- 15:00 **Terahertz spectrometer applying 1.5 μm fibre optoelectronics (invited talk)**
B. Sartorius, J. Boettcher, H. Künzel, H. Roehle
Fraunhofer Heinrich-Hertz-Institut, Berlin, Germany
- 15:30 **Photoelectron spectroscopy on a femtosecond time scale – ultrafast dissociation of the Br_2 molecule (invited talk)**
P. Wernet, K. Godehusen, J. Gaudin, O. Schwarzkopf, W. Eberhardt, M. Odelius
BESSY GmbH, Berlin; Stockholm University, Stockholm, Sweden
- 16:00 **Laser-induced ultrafast dynamics at surfaces of rare-earth metals investigated by nonlinear magneto-optics (invited talk)**
A. Melnikov, U. Bovensiepen
Fachbereich Physik, Freie Universität Berlin

Session: Photonic crystals

- 9:00 **Plenary talk**
Photonic crystal fibres: Light in a tight space
Philip Russell
Max-Planck-Forschungsgruppe and Universität Erlangen
- 10:00 **Scientific computing for the design of nano-optical devices**
S. Burger, L. Zschiedrich, J. Pomplun, F. Schmidt
Zuse Institute, Berlin; JCMwave GmbH, Putzbrunn
- 10:20 **Microstructuring soft glasses for applications in fiber lasers and x-ray optics**
A. Bjeoumikhov, P. Glas, N. Langhoff, G. Steinmeyer, R. Wedell
Institute for Scientific Instruments GmbH, Berlin; Institut für Angewandte Photonik eV, Berlin; Max-Born-Institute, Berlin
- 10:40 **Selectively filled photonic crystal fibers for ultra-sensitive fluorescence detection**
S. Smolka, M. Barth, O. Benson
Research Center COM, Technical University Denmark, Lyngby, Institut für Physik, Humboldt Universität zu Berlin
- 11:00 Break

Session: Optoelectronics

- 11:20 **Zn(Cd)O/ZnO - a new hetero system for visible-wavelength semiconductor lasing**
S. Sadofev, S. Kalusniak, J. Puls, F. Henneberger
Institut für Physik, Humboldt Universität zu Berlin
- 11:40 **Carrier dynamics in active-region materials for semiconductor laser applications**
J.W. Tomm, V. Talalaev
Max-Born-Institute, Berlin
- 12:00 **808-nm TM polarized high power broad area lasers with 70 % power conversion efficiency**
P. Crump, H. Wenzel, S. Einfeldt, P. Ressel, M. Zorn, F. Bugge, G. Erbert, G. Tränkle
Ferdinand-Braun-Institute, Berlin
- 12:20 **Highly efficient blue light generation with high brightness semiconductor lasers**
A. Jechow, A. Heuer, D. Skoczowsky, R. Menzel
Universität Potsdam
- 12:40 **400 mW optical output power at 488 nm using a monolithic DBR tape red diode laser**
M. Uebnickel, G. Blume, C. Fiebig, R. Güther, K. Paschke, G. Erbert
Ferdinand-Braun-Institute, Berlin
- 13:00 Break

Session: Semiconductor laser applications

- 14:30 **1 kW - low cost QCW diode laser stacks with high duty cycle**
W. Pittroff, G. Erbert, V. Blümel, B. Eppich, C. Fiebig, M. Moschner,
U. Röllig, K. Vogel, G. Tränkle
Ferdinand-Braun-Institute, Berlin; Jenoptik Laserdiode GmbH, Jena
- 14:50 **Linear diffusers with small angles for high power beam shaping**
R. Bitterli, T. Scharf, H.P. Herzig, A. Bich, S. Roth, C. Dumouchel,
R. Völkel, K.J. Weible
*Institute of Microtechnology, University of Neuchâtel;
SÜSS MicroOptics SA, Neuchâtel, Switzerland*
- 15:10 **Ultra-high precision non-contact distance measurement using multi-wavelength interferometry**
J. Petter, R. Nicolaus, A. Noack, T. Tschudi
Luphos GmbH, Darmstadt
- 15:30 **Customized microsystem technology based diode laser and sensor systems - application of a Raman sensor for the in situ food quality control (invited talk)**
B. Sumpf, M. Maiwald, G. Erbert, G. Tränkle, H. Schmidt, H.D. Kronfeldt
Ferdinand-Braun-Institute, Berlin; Institute for Optics and Atomic Physics, Technical University Berlin
- 16:00 Break

Poster session

16:15-18:00

- P1 **Interferometric testing of aspheric mirrors: the role of positioning tolerances**
S. Aigner, J.M. Asfour
Diopic GmbH, Weinheim
- P2 **Integrated 1060nm master oscillator power amplifier for high-power green light emitters**
O. Brox, F. Bugge, J. Fricke, A. Klehr, P. Ressel, H. Wenzel, G. Erbert,
G. Tränkle
Ferdinand-Braun-Institute, Berlin
- P3 **Oxygen sensor based on hollow-core photonic crystal fibres**
M. Cabaleiro, V. Lange, D. Kühlke
Hochschule Furtwangen
- P4 **Laser ablation of a liquid alloy (Galinstan®)**
H. Channaa, P. Surmann
Institut für Pharmazie, Freie Universität Berlin
- P5 **Cleaning and microanalysis of corroded metal coins using laser techniques**
E. Drakaki, N. Karadimitriou, I. Tsilikas, A.A. Serafetinides, Y. Agresti,
S. Siano
*Physics Department, National Technical University Athens, Greece;
Istituto di Fisica Applicata, CNR, Sesto Fiorentino, Italy*

- P6 **Comparative studies on the cleaning effect of Nd:YAG, Er:YAG and CO₂ laser sources on the surface of naval steel specimens**
E. Drakaki, N. Karadimitriou, A.A. Serafetinides, D.I. Pantelis, Y. Agresti, S. Siano, M. Sawczak, G. Sliwinski
Physics Department, National Technical University Athens, Greece; Istituto di Fisica Applicata, CNR, Sesto Fiorentino, Italy; Szewalski Institute, Polish Academy of Sciences, Gdansk, Poland
- P7 **Combination of electron beam microanalysis and micro-x-ray- fluorescence in SEM – chance for a complete elemental analysis**
M. Haschke, N. Kemf, Y. Höhn, F. Eggert
Institute for Scientific Instruments, Berlin; Institut für angewandte Photonik, Berlin
- P8 **Combination of different methods for calibrating systematic errors in interferometric measurements of cylindrical surface shapes**
C. Hellwig, M. Läger, T. Oberdoerster
Berliner Glas KGaA Herbert Kubatz GmbH&Co, Berlin
- P9 **Fiber-based spectroscopy and sensing: from atomic to cosmic scales**
A. Kelz, M. Kumke, H.G. Löhmannsröben, K. Janssen, S. Lau
Astrophysikalisches Institut Potsdam, Universität Potsdam, innoFSPEC Potsdam
- P10 **An arbitrary electromagnetic beam scattering by spheroidal particle**
E.E. M. Khaled, H. Louka
EE Dept, Assiut University, Telecom Egypt Company, Qina, Egypt
- P11 **Laser tweezers and ultraviolet microbeam for microsurgery and micromanipulation**
D. Kotsifaki, M. Makropoulou, A.A. Serafetinides
Physics Dept., National Technical University Athens, Greece
- P12 **Laser micromanipulation of stained liposomes during liposome-cell interaction**
E. Spyratou, M. Makropoulou, A.A. Serafetinides, I. Paraico, T. Savopol, M. Surleac, L. Bajenaru, E. Kovacs
Physics Dept., National Technical University Athens, Greece; University of Medicine and Pharmacy, Bucharest, Romania
- P13 **Cascaded induced lattices in quadratic nonlinear medium**
A.P. Sukhorukov, O.V. Borovkova, V.E. Lobanov
Faculty of Physics, Lomonosov Moscow State University, Russia
- P14 **Short pulse diode-pumped CPA Yb:YAG thin disc laser system with high single pulse energy and up to 100 W average power**
J. Tümmler, R. Jung, H. Stiel, K.A. Janulewicz, P.V. Nickles, W. Sandner, J. Speiser, A. Giesen
Max-Born-Institute, Berlin; Institut für Strahlwerkzeuge, Universität Stuttgart
- P15 **Classification and molecular structure identification of simple organic molecules following laser induced breakdown spectroscopy**
N. Melikechi*, Y. Markushin *, A. Marcano O. *, S. Rock* and D. Connolly**
* Center for Research and Education in Optical Sciences and Applications and Department of Physics and Pre-Engineering, Delaware State University, USA
** Fox Chase Cancer Center, Philadelphia, USA

Session: Optical sensing and process analysis

- 9:00 **Laser based infrared spectroscopy for sensitive chemical sensing (invited talk)**
Frans J.M. Harren
Life Science Trace Gas Facility, Radboud University Nijmegen, Netherlands
- 9:30 **Large tuning range quantum cascade laser modules for the detection of hazardous substances (invited talk)**
Joachim Wagner
Fraunhofer Institute for Applied Solid State Research, Freiburg
- 10:00 **Raman spectroscopy for measuring concentration profiles within micro channels**
G. Rinke, A. Ewinger, S. Kerschbaum, K. Schubert, M. Rinke
Forschungszentrum Karlsruhe, IMVT
- 10:20 **Laser-induced plasma spectroscopy (LIBS) for elemental process analysis (invited talk)**
I. Gornushkin, U. Panne
BAM Federal Institute for Materials Research and Testing, Berlin; Institut für Chemie, Humboldt Universität zu Berlin
- 10:50 Break

Session Medical optics

- 11:20 **Nanoeffects in cells and tissues produced by femtosecond and nanosecond laser pulses (invited talk)**
Alfred Vogel
Medical Laser Center, University of Lübeck
- 11:50 **NIR-Fluorescence Imaging Device for matched functional and morphological imaging**
T. Häupl
Laser and Medical Technology Berlin (LMTB)
- 12:10 **A two-frequency phase modulation technique for the use of phosphorescent nanoprobes to monitor molecular oxygen in fluorescent biological samples**
E. Schmälzlin, H.G. Löhmannsröben
University of Potsdam
- 12:30 **Fluorescence-based Meat Quality Monitoring Applying a Fibre Optical Sensor System**
H. Schröder, G. Lang, A. Gerritzen, J.S. Wulf, O. Schlüter
Fraunhofer Institute for Reliability and Microintegration (IZM), Berlin; Leibniz Institute for Agricultural Engineering Potsdam-Barnim
- 12:50 Closing remarks

Attendance information

Convention – Program Committee

Chairman

T. Elsässer

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im Forschungsverbund Berlin e. V.*

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- M. W. Sigrist, *ETH Zürich*
- G. Tränkle, *Ferdinand-Braun-Institut für
Höchstfrequenztechnik im Forschungsverbund Berlin e.V.*

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Co-Organizer

Technologiestiftung Innovationsagentur Berlin GmbH

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LASER OPTICS BERLIN

Date

Laser Optics Berlin Convention:
17–19 March 2008

Venue

Berlin Exhibition Ground, Palais am Funkturm
Entrance North Hall 19, Masurenallee

Attendance fees

- Convention permanent ticket – EUR 170,00 each (incl. 19% vat)
 - Convention day ticket – EUR 90,00 each (incl. 19% vat)
 - Student permanent ticket* – EUR 50,00 each (incl. 19% vat)
 - Student day ticket* – EUR 30,00 each (incl. 19% vat)
- * student ID necessary

Included Services

Delegates can also visit the exhibition and attend the workshops at the exhibition without extra charge.

Exhibition grounds

