



The Moscone Center
San Francisco, California, United States

1 - 6 February 2014

Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM) XIX

Monday - Thursday 3 - 6 February 2014

Conference Sessions At A Glance

[SHOW](#) | [HIDE](#)

- 1:** Laser-induced Modification and Patterning of Surfaces I: Joint Session with Conferences 8967 and 8969
- 2:** Laser-induced Modification and Patterning of Surfaces II: Joint Session with Conferences 8967 and 8969
- 3:** Nanomaterial Photonics and Plasmonics I: Joint Session with Conferences 8967 and 8969
- 4:** Nanomaterial Photonics and Plasmonics II: Joint Session with Conferences 8967 and 8969
- 5:** Ultrafast Laser-induced Modifications of Transparent Materials: Joint Session with Conferences 8967 and 8972
- 6:** Beam Shaping: Joint Session with Conferences 8967 and 8972
- 7:** Adaptive Optics and Beam Shaping: Joint Session with Conferences 8967 and 8972
- 8:** Ultrashort Pulse Micromachining: Joint Session with Conferences 8967 and 8972
Posters-Tuesday
- 9:** Materials for Energy Conservation
LASE Plenary Session
- 10:** Enhanced Processing by Multi-pulse
- 11:** Annealing and Forming of Microstructures
- 12:** Applications and Diagnostics of Laser Transfer Techniques: Joint Session with Conferences 8967 and 8970
- 13:** Time-resolved Diagnostic Techniques
- 14:** Processing and Diagnostics of Photovoltaics
- 15:** Photovoltaics and Energy Devices: Joint Session with Conferences 8967 and 8968

Important Dates

[SHOW](#) | [HIDE](#)

Abstract Due:
22 July 2013

Author Notification:
30 September 2013

Manuscript Due Date:
6 January 2014

Conference Committee

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Conference Chairs

[Yoshiki Nakata](#), Osaka Univ. (Japan)
[Xianfan Xu](#), Purdue Univ. (United States)
[Stephan Roth](#), BLZ Bayerisches Laserzentrum GmbH (Germany)
[Beat Neuenschwander](#), Berner Fachhochschule Technik und Informatik (Switzerland)

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[Koji Sugioka](#), RIKEN (Japan)

MONDAY 3 FEBRUARY[Show All Abstracts](#)

Session 1: Laser-induced Modification and Patterning of Surfaces I: Joint Session with Conferences 8967 and 8969

Monday 3 February 2014


8:00 AM - 10:00 AM

Session Chair: [Yoshiki Nakata](#), Osaka Univ. (Japan)**Excimer laser-induced nanoablation of amorphous and nanocrystalline diamond films**

Paper 8969-28

Time: 8:00 AM - 8:20 AM


Author(s): Maksim S. Komlenok, Viktor G. Raichenko, Sergei M. Pimenov, Vitaly I. Konov, A. M. Prokhorov General Physics Institute (Russian Federation)

[Add To My Schedule](#) **Black and colored metals and applications** *(Invited Paper)*

Paper 8967-1

Time: 8:20 AM - 8:50 AM


Author(s): Chunlei Guo, Univ. of Rochester (United States)

[Add To My Schedule](#) **Processing of nano-porous film based on plasmonic excitation of Au nanoparticles** *(Invited Paper)*

Paper 8967-2

Time: 8:50 AM - 9:20 AM

Author(s): Yasuyuki Tsuboi, Osaka City Univ. (Japan)

[Add To My Schedule](#) **Fluorescence and second-harmonic generation correlative microscopy to probe space charge separation during femtosecond direct laser writing**

Paper 8969-12

Time: 9:20 AM - 9:40 AM


Author(s): Lionel S. Canioni, Nicolas Marquestaut, Univ. Bordeaux 1 (France); Yannick G. Petit, Thierry Cardinal, Institut de Chimie de la Matière Condensée de Bordeaux (France)

[Add To My Schedule](#) **Real-time adaptive optimization of laser induced nano ripples by laser pulse shaping**

Paper 8967-3

Time: 9:40 AM - 10:00 AM

Author(s): Pornsak Srisungsitthisunti, King Mongkut's Univ. of Technology North Bangkok (Thailand); Marian Zamfirescu, Liviu P. Neagu, National Institute for Lasers, Plasma and Radiation Physics (Romania); Nicolas Faure, Lab Hubert Curien, Université Jean MONNET (France); Razvan Stoian, Lab. Hubert Curien (France)

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Coffee Break 10:00 AM - 10:30 AM

Session 2: Laser-induced Modification and Patterning of Surfaces II: Joint Session with Conferences 8967 and 8969

Monday 3 February 2014

10:30 AM - 12:10 PM


Session Chair: [Xianfan Xu](#), Purdue Univ. (United States)

The liquid phase assembly of metallic nanoparticle arrays using nanolithography and pulsed laser melting *(Invited Paper)*

Paper 8969-13

Time: 10:30 AM - 11:00 AM

Author(s): Jason D. Fowlkes, The Univ. of Tennessee (United States)


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Laser-induced patterns on metals and polymers for biomimetic surface engineering *(Invited Paper)*

Paper 8967-4

Time: 11:00 AM - 11:30 AM

Author(s): Anne-Marie Kietzig, Jorge Lehr, McGill Univ. (Canada); Luke Matus, McGill University (Canada); Fang Liang, McGill Univ. (Canada)


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Laser-induced periodic nanoparticle patterns

Paper 8969-14

Time: 11:30 AM - 11:50 AM

Author(s): Nathalie N. Destouches, Univ. de Lyon (France), Lab. Hubert Curien (France); Guy Vitrant, IMEP-LAHC (France), CEA-LETI-Minatec (France); Nicolas N. Crespo-Monteiro, Lab. Hubert Curien (France), Univ. de Lyon (France); Zeming Liu, Univ. de Lyon (France), Lab. Hubert Curien (France); Yaya Lefkir, Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France); Francis Vocanson, Lab. Hubert Curien (France), Univ. de Lyon (France); Thierry Epicier, Matériaux, Ingénierie et Sciences (MATEIS), UMR 5510 CNRS, Université de Lyon, INSA-Lyon (France)


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Growth evolution of high spatial frequency LIPSS on SiC crystal surfaces

Paper 8967-5

Time: 11:50 AM - 12:10 PM

Author(s): Go Obara, Hisashi Shimizu, Taira Enami, Keio Univ. (Japan); Meng-Ju Sher, Benjamin Franta, Harvard Univ. (United States); Eric Mazur, Harvard School of Engineering and Applied Sciences (United States); Mitsuhiro Terakawa, Minoru Obara, Keio Univ. (Japan)

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Lunch Break 12:10 PM - 1:30 PM

Session 3: Nanomaterial Photonics and Plasmonics I: Joint Session with Conferences 8967 and 8969

Monday 3 February 2014

1:30 PM - 3:20 PM


Session Chair: [Richard F. Haglund](#), Vanderbilt Univ. (United States)

Optothermal response of plasmonic nanofocusing lens under picosecond laser irradiation *(Invited Paper)*

Paper 8967-6

Time: 1:30 PM - 2:00 PM

Author(s): zhidong Du, Chen Chen, Luis Traverso, Xianfan Xu, Purdue University (United States); Liang Pan, Purdue Univ. (United States); Dennis Tsao, Adrienne Lavine, University of California, Los Angeles (United States)


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Optical and electronic properties of transition metal dichalogenides at monolayer thickness *(Invited Paper)*

Paper 8969-15

Time: 2:00 PM - 2:30 PM

Author(s): Tony F. Heinz, Columbia Univ. (United States)


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Near-infrared emission from freestanding single- and few-layer graphene

Paper 8969-16

Time: 2:30 PM - 2:50 PM

Author(s): Tu Hong, Yunhao Cao, Da Ying, Yaqiong Xu, Vanderbilt Univ. (United States)


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Nanophotonics for light-management in thin-film photovoltaics and optical nanopatterning for their fabrication *(Invited Paper)*

Paper 8969-17

Time: 2:50 PM - 3:20 PM

Author(s): Rajesh Menon, The Univ. of Utah (United States)

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Coffee Break 3:20 PM - 3:50 PM

Session 4: Nanomaterial Photonics and Plasmonics II: Joint Session with Conferences 8967 and 8969

Monday 3 February 2014

3:50 PM - 5:50 PM


Session Chair: [Jan J. Dubowski](#), Univ. de Sherbrooke (Canada)

Multifunctional materials for electronics and photonics *(Invited Paper)*

Paper 8969-18

Time: 3:50 PM - 4:20 PM

Author(s): Riad Nechache, Federico Rosei, INRS, Univ. du Québec (Canada)


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Optical-only methods for measuring charge carrier diffusion in colloidal quantum dot films *(Invited Paper)*

Paper 8969-19

Time: 4:20 PM - 4:50 PM

Author(s): Oleksandr Voznyy, Univ. of Toronto (Canada)


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Polarization-dependent switching in gold-vanadium dioxide heterodimers

Paper 8969-20

Time: 4:50 PM - 5:10 PM

Author(s): Kannatassen Appavoo, Richard F. Haglund, Vanderbilt Univ. (United States)


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Resonant-cavity effects on plasmon-enhanced photoluminescence in zinc-oxide core-shell nanowires

Paper 8969-21

Time: 5:10 PM - 5:30 PM

Author(s): Daniel C. Mayo, Claire Marvinney, Ephraim Billig, Vanderbilt Univ. (United States); Richard Mu, Fisk Univ. (United States); Richard F. Haglund, Vanderbilt Univ. (United States)


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Femtosecond pump-probe spectroscopy of Au/TiO₂ nanocomposites: the evolution of localized plasmon resonance and its connection to charge transfer effects

Paper 8969-22

Time: 5:30 PM - 5:50 PM

Author(s): Arseny Aybushev, Andrey N. Kostrov, Fedor Gostev, Viktor A. Nadtochenko, N.N. Semenov Institute of Chemical Physics (Russian Federation)

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TUESDAY 4 FEBRUARY

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**Session 5:
Ultrafast Laser-induced Modifications of Transparent Materials: Joint Session
with Conferences 8967 and 8972**

Tuesday 4 February 2014

8:00 AM - 10:30 AM


Session Chair: [Stefan Nolte](#), Friedrich-Schiller-Univ. Jena (Germany)

Femtosecond laser 3D nanofabrication in glass: enabling direct write of integrated micro/nanofluidic chips *(Invited Paper)*

Paper 8967-7

Time: 8:00 AM - 8:30 AM

Author(s): Ya Cheng, Yang Liao, Shanghai Institute of Optics and Fine Mechanics (China); Koji Sugioka, RIKEN (Japan)


[Add To My Schedule](#) 

Flexible metal patterning in glass microfluidic structures using femtosecond laser direct-write ablation followed by electroless plating

Paper 8967-8

Time: 8:30 AM - 8:50 AM

Author(s): Jian Xu, Katsumi Midorikawa, Koji Sugioka, RIKEN (Japan)


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Nanosecond laser-induced back side wet etching of fused silica with a copper-based absorber liquid

Paper 8967-9

Time: 8:50 AM - 9:10 AM

Author(s): Pierre Lorenz, Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany); Sarah Zehnder, Berner Fachhochschule Technik und Informatik (Switzerland); Martin Ehrhardt, Frank Frost, Klaus-Peter Zimmer, Leibniz-Institut für Oberflächenmodifizierung e.V. (Germany); Patrick Schwaller, Berner Fachhochschule Technik und Informatik (Switzerland)


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Contrasting femtosecond laser-written Fabry-Perot resonators, Mach-Zehnder-type interferometers and micro-cavity arrays for lab-in-fiber (LIF) sensing

Paper 8972-43

Time: 9:10 AM - 9:30 AM

Author(s): Moez Haque, Yiwen Shen, Kenneth K. C. Lee, Peter R. Herman, Univ. of Toronto (Canada)


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Picosecond-laser bulk modification, luminescence and Raman lasing in single-crystal diamond

Paper 8967-10

Time: 9:30 AM - 9:50 AM

Author(s): Beat Neuenschwander, Berner Fachhochschule Technik und Informatik (Switzerland); Sergei M. Pimenov, A. M. Prokhorov General Physics Institute (Russian Federation); Beat Jaeggi, Valerio Romano, Berner Fachhochschule Technik und Informatik (Switzerland)


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Dynamics of interference of femtosecond laser-induced stress waves and crack formation inside a LiF single crystal

Paper 8967-11

Time: 9:50 AM - 10:10 AM

Author(s): Masaaki Sakakura, Naoaki Fukuda, Yasuhiko Shimotsuma, Kiyotaka Miura, Kyoto Univ. (Japan)


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Ultrafast laser-assisted local energy deposition in bulk silicon

Paper 8972-44

Time: 10:10 AM - 10:30 AM

Author(s): Alexandros Mouskeftaras, David Grojo, Raphael G. C. R. Clady, Stéphanie Leyder, Olivier Uteza, Marc L. Sentis, Lasers, Plasmas et Procédés Photoniques (France); Andrei V. Rode, The Australian National Univ. (Australia); Philippe Delaporte, Lasers, Plasmas et Procédés Photoniques (France)

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Coffee Break 10:30 AM - 11:00 AM

Session 6: Beam Shaping: Joint Session with Conferences 8967 and 8972

Tuesday 4 February 2014

11:00 AM - 12:30 PM


Session Chair: [Peter R. Herman](#), Univ. of Toronto (Canada)

Spatial and temporally focused femtosecond laser pulses for material processing *(Invited Paper)*

Paper 8967-12

Time: 11:00 AM - 11:30 AM

Author(s): Jeffrey A. Squier, Jens U. Thomas, Erica K. Block, Charles G. Durfee, Colorado School of Mines (United States); Sterling J. Backus, Kapteyn-Murnane Labs., Inc. (United States)


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Simultaneously spatially and temporally focusing light for tailored ultrafast micro-machining

Paper 8972-45

Time: 11:30 AM - 11:50 AM

Author(s): Jens U. Thomas, Friedrich-Schiller-Univ. Jena (Germany); Erica K. Block, Michael J. Greco, Amanda K. Meier, Charles G. Durfee, Jeffrey A. Squier, Colorado School of Mines (United States); Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)


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In situ spectral phase characterization of simultaneous spatially and temporally focused pulses

Paper 8972-46

Time: 11:50 AM - 12:10 PM

Author(s): Michael J. Greco, Erica K. Block, Charles G. Durfee, Jeffrey A. Squier, Amanda K. Meier, Jens U. Thomas, Colorado School of Mines (United States)


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A brief analysis on pulse front tilt in simultaneous spatial and temporal focusing

Paper 8972-47

Time: 12:10 PM - 12:30 PM

Author(s): Site Zhang, Frank Wyrowski, Robert Kammel, Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany)

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Lunch/Exhibition Break 12:30 PM - 1:50 PM

Session 7: Adaptive Optics and Beam Shaping: Joint Session with Conferences 8967 and 8972

Tuesday 4 February 2014

1:50 PM - 3:30 PM


Session Chair: [Stephan Roth](#), BLZ Bayerisches Laserzentrum GmbH (Germany)

Dynamic optics for laser direct writing *(Invited Paper)*

Paper 8967-13

Time: 1:50 PM - 2:20 PM

Author(s): Patrick Salter, Martin J. Booth, Univ. of Oxford (United Kingdom)


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Femtosecond laser processing and spatial light modulator *(Invited Paper)*

Paper 8967-14

Time: 2:20 PM - 2:50 PM

Author(s): Kimmo Päiväsaari, Martti Silvennoinen, Univ. of Eastern Finland (Finland); Jarno Kaakkunen, VTT Technical Research Centre of Finland, Laser Processing Applications (Finland); Pasi Vahimaa, Univ. of Eastern Finland (Finland)


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Monolithic hybrid optics for focusing ultrashort laser pulses

Paper 8972-48

Time: 2:50 PM - 3:10 PM

Author(s): Ulrike Fuchs, asphericon GmbH (Germany)


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Focal length stabilization of a tunable lens integrated focus shifting unit

Paper 8967-15

Time: 3:10 PM - 3:30 PM

Author(s): Gregory Eberle, Benjamin Boesser, Konrad Wegener, ETH Zurich (Switzerland)

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Coffee Break 3:30 PM - 4:00 PM

Session 8: Ultrashort Pulse Micromachining: Joint Session with Conferences 8967 and 8972

Tuesday 4 February 2014

4:00 PM - 5:50 PM


Session Chair: [Andreas Ostendorf](#), Ruhr-Univ. Bochum (Germany)

Ultrashort pulse lasers for precise processing: overview on a current German research initiative *(Invited Paper)*

Paper 8972-49

Time: 4:00 PM - 4:30 PM

Author(s): Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany)


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Influence of laser parameters on quality of microholes and process efficiency

Paper 8967-16

Time: 4:30 PM - 4:50 PM

Author(s): Anne Feuer, Christoph Kunza, Univ. Stuttgart (Germany); Martin Kraus, Robert Bosch GmbH (Germany); Volkher Onuseit, Rudolf Weber, Thomas Graf, Univ. Stuttgart (Germany); Denis Ingildeev, Institut fuer Textilchemie und Chemiefasern (Germany); Frank Hermanutz, ITV - Denkendorf (Germany)


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Trepanning drilling of stainless steel using a high-power Ytterbium-doped fiber ultrafast laser: influence of pulse duration on hole geometry and processing quality

Paper 8972-50

Time: 4:50 PM - 5:10 PM

Author(s): John Lopez, Univ. Bordeaux 1 (France); Mathieu Dijoux, Marc Faucon, Rainer Kling, ALPhANOV (France)


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High-precision micromachining with ultraviolet wavelength picosecond lasers

Paper 8972-51

Time: 5:10 PM - 5:30 PM

Author(s): Mark Thompson, Colin J. Moorhouse, Coherent Scotland Ltd. (United Kingdom)


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Determination of the AISI 1045 steel ablation threshold dependence on the pulse superposition using the Diagonal Scan (D-Scan) technique

Paper 8972-52

Time: 5:30 PM - 5:50 PM

Author(s): Ricardo E. Samad, Denilson C. Mirim, Wagner de Rossi, Nilson D. Dias Vieira, Instituto de Pesquisas Energéticas e Nucleares (Brazil)

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Session PTue: Posters-Tuesday

Tuesday 4 February 2014

6:00 PM - 8:00 PM


Conference attendees are invited to attend the LASE poster session on Tuesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges to the poster sessions. Poster authors, view poster presentation guidelines and set-up instructions at <http://spie.org/PWPPosterGuidelines>.

Spot size dependence of LIPSS formation threshold using femtosecond laser

Paper 8967-46

Time: 6:00 PM - 8:00 PM

Author(s): Hisashi Shimizu, Mitsuhiro Terakawa, Go Obara, Keio Univ. (Japan)


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Laser radiation attenuator on the basis of four Dove's prisms

Paper 8967-47

Time: 6:00 PM - 8:00 PM

Author(s): Jan A. Owsik, Military Univ. of Technology (Poland); Anatoly A. Liberman, Alexander A. Kovalev, Alexey S. Mikryukov, Sergey A. Moskalyuk, Michail V. Ulanovsky, All-Russian Research Institute for Optical and Physical Measurement (Russian Federation); Janusz Noga, Military Univ. of Technology (Poland); Anna Z. Rembielinska, LOT Polish Airlines (Poland); Joanna Walczuk, Agencja Restrukturyzacji i Modernizacji Rolnictwa (Poland)


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High precision laser forming for micro actuation

Paper 8967-49

Time: 6:00 PM - 8:00 PM

Author(s): Ger K. G. P. Folkersma, Gert-Willem R. Römer, Univ. of Twente (Netherlands); Dannis M. Brouwer, Univ. Twente (Netherlands); Bert A. J. Huis in 't Veld, Univ. Twente (Netherlands), TNO Technical Sciences (Netherlands)


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Laser texturing glass substrates for light in-coupling in silicon thin-film solar cells

Paper 8967-50

Time: 6:00 PM - 8:00 PM

Author(s): Kambalakwo Chakanga, Ortwin Siepmann, Oleg Sergeev, Karsten von Maydell, Carsten Agert, Next Energy (Germany)


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Smart optical writing head design for laser-based manufacturing

Paper 8967-51

Time: 6:00 PM - 8:00 PM

Author(s): Muhammad Junaid J. Amin, Nabeel A. Riza, Univ. College Cork (Ireland)


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High quality ZnO film formation by CO₂ laser annealing of buried films in SiO₂ matrix

Paper 8967-52

Time: 6:00 PM - 8:00 PM

Author(s): Kota Yamasaki, Hiroshi Ikenoue, Tetsuya Shimogaki, Yousuke Watanabe, Daisuke Nakamura, Tatsuo Okada, Kyushu Univ. (Japan)


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Selective realignment of the exchange-biased magnetization direction in spintronic layer stacks using continuous and pulsed-laser radiation

Paper 8967-53

Time: 6:00 PM - 8:00 PM

Author(s): Isabel Berthold, Hochschule Mittweida (Germany)


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Shape-controlled ZnO nanocrystals using multi-beam interference irradiation

Paper 8967-54

Time: 6:00 PM - 8:00 PM

Author(s): Daisuke Nakamura, Tetsuya Shimogaki, Yuki Muraoka, Shihomi Nakao, Kosuke Harada, Mitsuhiro Higashihata, Kyushu Univ. (Japan); Yoshiki Nakata, Osaka Univ. (Japan); Tatsuo Okada, Kyushu Univ. (Japan)


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Performance optimization of electronics circuits laser repair

Paper 8967-55

Time: 6:00 PM - 8:00 PM

Author(s): Ram Oron, Orbotech Ltd. (Israel)


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Femtosecond laser production of mixed metal oxides for efficient water oxidation

Paper 8967-56

Time: 6:00 PM - 8:00 PM

Author(s): Kasey C. Phillips, Jin Suntivich, Cynthia M. Friend, Harvard Univ. (United States); Eric Mazur, Harvard School of Engineering and Applied Sciences (United States)


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Study of fast laser-induced cutting of silicon materials

Paper 8967-57

Time: 6:00 PM - 8:00 PM

Author(s): Sebastian Weinhold, Hochschule Mittweida (Germany)

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WEDNESDAY 5 FEBRUARY

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Session 9: Materials for Energy Conservation

Wednesday 5 February 2014


8:10 AM - 10:00 AM

Session Chair: [Yongfeng Lu](#), Univ. of Nebraska-Lincoln (United States)**Development of high Tc superconducting coated conductors based on laser processing technologies** (*Invited Paper*)

Paper 8967-17

Time: 8:10 AM - 8:40 AM


Author(s): Takanobu Kiss, Kyushu Univ. (Japan); Teruo Izumi, International Superconductivity Technology Ctr. (Japan); Yasuhiro Iijima, Fujikura Ltd. (Japan); Yuh Shiohara, International Superconductivity Technology Ctr. (Japan)

[Add To My Schedule](#) **Laser cutting of carbon fiber reinforced plastics (CFRP) by single-mode fiber laser irradiation**

Paper 8967-18

Time: 8:40 AM - 9:00 AM


Author(s): Hiroyuki Niino, Yoshizo Kawaguchi, Tadatake Sato, Aiko Narazaki, AIST (Japan), Advanced Laser and Process Technology Research Association (Japan); Ryoza Kurosaki, AIST (Japan); Mayu Muramatsu, Yoshihisa Harada, AIST (Japan), Advanced Laser and Process Technology Research Association (Japan); Kenji Anzai, Mitsuaki Aoyama, Miyachi Corp. (Japan), Advanced Laser and Process Technology Research Association (Japan); Masafumi Matsushita, Koichi Furukawa, Shin Nippon Koki Co. Ltd. (Japan), Advanced Laser and Process Technology Research Association (Japan); Michiteru Nishino, Mitsubishi Chemical Corp. (Japan), Advanced Laser and Process Technology Research Association (Japan); Akira Fujisaki, Taizo Miyato, Takashi Kayahara, Furukawa Electric Co., Ltd. (Japan), Advanced Laser and Process Technology Research Association (Japan)

[Add To My Schedule](#) **Laser trepanning of CFRP with a scanner head for IR and UV lasers**

Paper 8967-19

Time: 9:00 AM - 9:20 AM


Author(s): Kenji Anzai, Mitsuaki Aoyama, Miyachi Corp. (Japan), Advanced Laser and Process Technology Research Association (Japan); Akira Fujisaki, Taizo Miyato, Takashi Kayahara, Furukawa Electric Co., Ltd. (Japan), Advanced Laser and Process Technology Research Association (Japan); Yoshihisa Harada, Hiroyuki Niino, National Institute of Advanced Industrial Science and Technology (Japan), Advanced Laser and Process Technology Research Association (Japan)

[Add To My Schedule](#) **Ablation dynamics and shock wave expansion during laser processing of CFRP with ultrashort laser pulses**

Paper 8967-20

Time: 9:20 AM - 9:40 AM


Author(s): Margit Wiedenmann, Christian Freitag, Volker Onuseit, Rudolf Weber, Thomas Graf, Univ. Stuttgart (Germany)

[Add To My Schedule](#) **Analysis on laser ablation dynamics of CFRP in order to reduce heat affected zone**

Paper 8967-21

Time: 9:40 AM - 10:00 AM

Author(s): Yuji Sato, Masahiro Tsukamoto, Osaka Univ. (Japan); Tatsuya Nariyama, Kinki Univ. (Japan); Kazuki Nakai, Kenjiro Takahashi, Shinichiro Masuno, Osaka Univ. (Japan); Tomomasa Ohkubo, Tokyo Institute of Technology (Japan); Hitoshi Nakano, Kinki Univ. (Japan)

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Coffee Break 10:00 AM - 10:20 AM

LASE Plenary Session

Wednesday 5 February 2014

10:20 AM - 12:30 PM

Session Chairs: **Bo Gu**, Bos Photonics (United States); **Andreas Tünnermann**, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) and Friedrich-Schiller-Univ. Jena (Germany)

10:20 am: **Welcome and Opening Remarks**, Bo Gu, Bos Photonics (United States); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) and Friedrich-Schiller-Univ. Jena (Germany)

10:25 am: **Announcement of the Best "Green" LASE Paper Award**, Stephen J. Eglash, Energy and Environment Affiliates Program, Stanford Univ. (United States)

10:30 am: **Photonics21 and the Perspectives from the European Photonics Industry**, Michael Mertin, JENOPTIK AG (Germany)

11:10 am: **Femtosecond Laser 3D Micromachining and its Applications to Biochip Fabrication**, Koji Sugioka, RIKEN (Japan)

11:50 am: **A New Plasmonics Enhanced Ultrafast Laser Multi-Nanoscale**, Michel Meunier, Ecole Polytechnique de Montréal (Canada)

Lunch/Exhibition Break 12:30 PM - 2:00 PM

Session 10: Enhanced Processing by Multi-pulse

Wednesday 5 February 2014

2:00 PM - 3:20 PM


Session Chair: [Stephan Roth](#), BLZ Bayerisches Laserzentrum GmbH (Germany)

Application of a laser heterodyne technique to characterize surface acoustic waves generated via a pulsed laser excitation

Paper 8967-22

Time: 2:00 PM - 2:20 PM

Author(s): Anthony J. Manzo, Henry Helvajian, The Aerospace Corp. (United States)


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Maximizing laser ablation efficiency of silicon through optimization of the temporal pulse shape

Paper 8967-23

Time: 2:20 PM - 2:40 PM

Author(s): Alain Cournoyer, David Gay, INO (Canada); Pascal Turbis, Univ. de Montréal (Canada); Emmanuel Lorin de la Grandmaison, Carleton Univ. (Canada); Martin Briand, Yves Taillon, INO (Canada)


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Laser thin film ablation with multiple beams and tailored beam profiles

Paper 8967-24

Time: 2:40 PM - 3:00 PM

Author(s): Stefan Rung, Univ. of Applied Sciences Aschaffenburg (Germany); Christian Bischoff, Erwin E. Jäger, Udo Umhofer, TOPAG Lasertechnik GmbH (Germany); Ralf Hellmann, Univ. of Applied Sciences Aschaffenburg (Germany)


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High-throughput and high-precision laser micromachining with ps-pulses in synchronized mode with a fast polygon line scanner

Paper 8967-25

Time: 3:00 PM - 3:20 PM

Author(s): Beat Neuenschwander, Beat Jaeggi, Markus Zimmermann, Berner Fachhochschule Technik und Informatik (Switzerland); Lars Penning, Ronny DeLoor, Next Scan Technology B.V. (Netherlands)

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Coffee Break 3:20 PM - 3:50 PM

Session 11: Annealing and Forming of Microstructures

Wednesday 5 February 2014

3:50 PM - 5:30 PM


Session Chair: [Masaaki Sakakura](#), Kyoto Univ. (Japan)

Formation of corrosion-resistant iron thin films by F2 laser-induced surface modification

Paper 8967-26

Time: 3:50 PM - 4:10 PM

Author(s): Masayuki Okoshi, National Defense Academy (Japan); Yuta Awaiharu, Tsugito Yamashita, Kanto Gakuin Univ. (Japan); Narumi Inoue, National Defense Academy (Japan)


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Precision laser annealing of silicon devices for enhanced electro-optic performance

Paper 8967-27

Time: 4:10 PM - 4:30 PM

Author(s): Daniel A. Bender, Sandia National Labs. (United States); Christopher T. DeRose, Sandia National Labs (United States); Andrew Starbuck, Jason C. Verley, Mark W. Jenkins, Sandia National Labs. (United States)


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Laser annealing and simulation of amorphous silicon thin films for solar cell applications

Paper 8967-28

Time: 4:30 PM - 4:50 PM

Author(s): John Theodorakos, Yiannis S. Raptis, National Technical Univ. of Athens (Greece); Vasilis Vamvakas, HelioSphera (Greece); Dimitris Tsoukalas, Ioanna Zergioti, National Technical Univ. of Athens (Greece)


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Novel industrial laser etching technics for sensors miniaturization applied to biomedical: a comparison of simulation and experimental approach

Paper 8967-29

Time: 4:50 PM - 5:10 PM

Author(s): Julien Zelgowski, Icube (France), IREPA LASER (France), Lab. Hubert Curien (France); Frédéric Mermet, IREPA LASER (France); Frédéric Antoni, Icube (France); Cyril Mauclair, Lab. Hubert Curien (France); Eric Fogarassy, Icube (France); Eric Mottay, Amplitude Systèmes (France)


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Surface structuring of zirconium-based bulk metallic glasses using ultrashort laser pulses

Paper 8967-30

Time: 5:10 PM - 5:30 PM

Author(s): Claus A. Dold, Institut für Werkzeugmaschinen und Fertigung (Switzerland); Martin Kachel, Dirk Wortmann, RWTH Aachen (Germany); Victor Wessels, ETH Zurich (Switzerland); Andreas Dohrn, Fraunhofer-Institut für Lasertechnik (Germany); Arie Bruinink, EMPA (Switzerland); Frank Pude, Inspire AG (Switzerland); Jörg F. Löffler, ETH Zurich (Switzerland); Reinhart Poprawe, Fraunhofer-Institut für Lasertechnik (Germany); Konrad Wegener, ETH Zurich (Switzerland)

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THURSDAY 6 FEBRUARY

[Show All Abstracts](#)

Session 12: Applications and Diagnostics of Laser Transfer Techniques: Joint Session with Conferences 8967 and 8970

Thursday 6 February 2014

8:00 AM - 10:00 AM


Session Chairs: [Masayuki Okoshi](#), National Defense Academy (Japan); [Daisuke Nakamura](#), Kyushu Univ. (Japan)

Simple technique for high rate and highly conductive metal (Al) deposition on silicon by laser selective metallization

Paper 8970-15

Time: 8:00 AM - 8:20 AM


Author(s): Armel Bahouka, Frédéric Mermet, IREPA LASER (France); Pablo M. Romero, Nerea Otero, Ivette Coto, Cristina Leira, Alejandro González, Asociación de Investigación Metalúrgica del Noroeste (Spain); Thomas Schutz-Kuchly, Karim Derbouz Draoua, Abdelilah Slaoui, ICube (France)

[Add To My Schedule](#) **The shape of nanospheres propelled by femtosecond laser-excited enhanced near field**

Paper 8970-16

Time: 8:20 AM - 8:40 AM


Author(s): Takuya Shinohara, Mitsuhiro Terakawa, Keio Univ. (Japan)

[Add To My Schedule](#) **Laser-induced forward transfer as an immobilization tool for biosensor applications**

Paper 8970-17

Time: 8:40 AM - 9:00 AM


Author(s): Marianneza Chatzipetrou, National Technical Univ. of Athens (Greece); Christos Boutopoulos, Ecole Polytechnique de Montréal (Canada); Athanasios Papathanassiou, National Technical Univ. of Athens (Greece); Eleftherios Touloupakis, Univ. of Crete (Greece); Ioanna Zergioti, National Technical Univ. of Athens (Greece)

[Add To My Schedule](#) **Study of direct writing of heavily doped Al and Bi heterojunctions on Si by laser transfer doping**

Paper 8967-31

Time: 9:00 AM - 9:20 AM


Author(s): Pablo M. Romero, Nerea Otero, Asociación de Investigación Metalúrgica del Noroeste (Spain)

[Add To My Schedule](#) **High-resolution imaging of ejection dynamics in laser-induced forward transfer**

Paper 8967-32

Time: 9:20 AM - 9:40 AM


Author(s): Ralph Pohl, C. W. Visser, Gert-Willem R. Römer, C. Sun, Bert A. Huis in 't Veld, Detlef Lohse, Univ. Twente (Netherlands)

[Add To My Schedule](#) **Pump-probe investigations and numerical simulation of the confined laser ablation of thin molybdenum films**

Paper 8967-33

Time: 9:40 AM - 10:00 AM

Author(s): Juergen Sotrop, Alfred Kersch, Matthias Domke, Heinz P. Huber, Munich Univ. of Applied Sciences (Germany)

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Coffee Break 10:00 AM - 10:30 AM

**Session 13:
Time-resolved Diagnostic Techniques**

Thursday 6 February 2014


10:30 AM - 11:30 AM

Session Chair: [Klaus Sokolowski-Tinten](#), Univ. Duisburg-Essen (Germany)**Short pulse laser-induced switching of phase change materials studied by time-resolved X-ray scattering**

Paper 8967-34

Time: 10:30 AM - 10:50 AM

Author(s): Klaus Sokolowski-Tinten, Univ. Duisburg-Essen (Germany)


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Synchronized videography of plasma plume expansion during femtosecond laser ablation

Paper 8967-36

Time: 10:50 AM - 11:10 AM


Author(s): Steven Paolasini, Anne-Marie Kietzig, McGill Univ. (Canada)

[Add To My Schedule](#) **Ultrafast imaging of free carriers: controlled excitation with chirped ultrafast laser Bessel beams**

Paper 8967-37

Time: 11:10 AM - 11:30 AM

Author(s): Praveen Kumar Velpula, Lab. Hubert Curien (France); Manoj Kumar Bhuyan, Lab. Hubert Curien (France), Univ. Jean Monnet (France), Univ. de Lyon (France); Cyril Mauclair, Lab. Hubert Curien (France), Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France); Jean-Philippe Colombier, Razvan Stoian, Lab. Hubert Curien (France), Univ. Jean Monnet Saint-Etienne (France), Univ. de Lyon (France)

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Lunch/Exhibition Break 11:30 AM - 1:40 PM

**Session 14:
Processing and Diagnostics of Photovoltaics**

Thursday 6 February 2014


1:40 PM - 3:20 PM

Session Chair: [Beat Neuenschwander](#), Berner Fachhochschule Technik und Informatik (Switzerland)**Time-resolved microscopy studies at fs laser-irradiated surfaces**

Paper 8967-38

Time: 1:40 PM - 2:00 PM


Author(s): Klaus Sokolowski-Tinten, Matthieu Nicoul, Azize Koc, Florian Quirin, Univ. Duisburg-Essen (Germany)

[Add To My Schedule](#) **Rapid composition analysis of compound semiconductor thin film solar cell by laser induced breakdown spectroscopy**

Paper 8967-39

Time: 2:00 PM - 2:20 PM


Author(s): Suk-Hee Lee, C. K. Kim, J. H. In, Sung Ho Jeong, Gwangju Institute of Science and Technology (Korea, Republic of)

[Add To My Schedule](#) **Modeling of laser patterning of thin-film solar cells**

Paper 8967-40

Time: 2:20 PM - 2:40 PM


Author(s): Thomas Peschel, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany); Gabor Matthäus, Institute of Applied Physics, Friedrich-Schiller-University (Germany); Stefan Nolte, Friedrich-Schiller-Univ. Jena (Germany); Ramona Eberhardt, Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany)

[Add To My Schedule](#) **Optimizing process time of laser drilling processes in solar cell manufacturing by coaxial camera control**

Paper 8967-41

Time: 2:40 PM - 3:00 PM


Author(s): Volker Jetter, Fraunhofer-Institut für Physikalische Messtechnik (Germany); Simon Gutscher, Fraunhofer-Institut für Solare Energiesysteme (Germany); Andreas Blug, Fraunhofer-Institut für Physikalische Messtechnik (Germany); Annerose Knorz, Christopher Ahrbeck, Jan Nekarda, Fraunhofer-Institut für Solare Energiesysteme (Germany); Daniel Carl, Fraunhofer-Institut für Physikalische Messtechnik (Germany)

[Add To My Schedule](#) **Silver-free solar cell interconnection by laser spot welding of thin aluminum layers: analysis of process limits for ns- and μ s-lasers**

Paper 8967-48

Time: 3:00 PM - 3:20 PM

Author(s): Henning Schulte-Huxel, Susanne Blankemeyer, Sarah Kajari-Schröder, The Institut für Solarenergieforschung Hameln (Germany); Rolf Brendel, The Institut für Solarenergieforschung Hameln (Germany), Leibniz Univ. Hannover (Germany)

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Coffee Break 3:20 PM - 3:50 PM

Session 15: Photovoltaics and Energy Devices: Joint Session with Conferences 8967 and 8968

Thursday 6 February 2014

3:50 PM - 6:00 PM


Session Chairs: [Yoshiki Nakata](#), Osaka Univ. (Japan); [Udo Klotzbach](#), Fraunhofer IWS Dresden (Germany)

New strategies in laser processing of TCOs for light management in thin-film silicon solar cells *(Invited Paper)*

Paper 8968-30

Time: 3:50 PM - 4:20 PM

Author(s): Carlos Molpeceres, Sara Lauzurica, Isabel Sanchez, Miguel Morales, Univ. Politécnica de Madrid (Spain); David Canteli, Ignacio Torres, Susana Fernández, José-Pablo Gonzalez, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Marta LLuscà, Joan Bertomeu, Univ. de Barcelona (Spain)


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Optimized laser patterning for high performance Cu(In,Ga)Se₂ thin-film solar modules

Paper 8967-43

Time: 4:20 PM - 4:40 PM

Author(s): Andreas Burn, Martin Mural, Berner Fachhochschule Technik und Informatik (Switzerland); Reiner M. Witte, Solneva SA (Switzerland); Shiro Nishiwaki, Stephan Bücheler, EMPA (Switzerland); Lukas Krainer, Onefive GmbH (Switzerland); Valerio Romano, Berner Fachhochschule Technik und Informatik (Switzerland)


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Quasi-simultaneous laser soldering for the interconnection of back-contact solar cells with composite foils

Paper 8968-31

Time: 4:40 PM - 5:00 PM

Author(s): Simon W. Britten, Rumitha Seva Bala Sundaram, Alexander Olowinsky, Arnold Gillner, Fraunhofer-Institut für Lasertechnik (Germany)


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Investigations of laser ablation processes in thin-films for photovoltaic applications

Paper 8967-44

Time: 5:00 PM - 5:20 PM

Author(s): Paulius Gecys, Gediminas Raciukaitis, Edgaras Markauskas, Juozas Dudutis, Ctr. for Physical Sciences and Technology (Lithuania)


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Utilizing the transparency of semiconductors via backside machining with a nanosecond 2 μm Tm: fiber laser

Paper 8968-32

Time: 5:20 PM - 5:40 PM

Author(s): Nils Gehlich, Fraunhofer-Institut für Lasertechnik (Germany), CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Tobias Bonhoff, Fraunhofer Institute for Laser Technology (Germany), CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Laura Sisken, Mark Ramme, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States); Christian Gaida, Martin Gebhardt, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States), Friedrich-Schiller-Univ. Jena (Germany); Ilya Mingareev, Lawrence Shah, Martin C. Richardson, CREOL, The College of Optics and Photonics, Univ. of Central Florida (United States)


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Study of a-Si crystallization dependence on power and irradiation time using a cw green laser

Paper 8968-33

Time: 5:40 PM - 6:00 PM

Author(s): Miguel Morales, David Munoz-Martin, Yu Chen, Oscar García, Juan J. García-Ballesteros, Univ. Politécnica de Madrid (Spain); Julio Cárabe, Javier Gandía, Ctr. de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain); Carlos Molpeceres, Univ. Politécnica de Madrid (Spain)

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