# DAY-1: MAY 16, 2006, TUESDAY

**Events: 1 Plenary, 4 parallels, and Poster Session**

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| **10:00** | **Opening Remarks ( I. Miyamoto )** |

## Plenary

**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(10:10-12:10, 120min.)**

| TIME | Chair: K. Itoh, Osaka Univ., Japan |
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| **10:10** | **#Tu1-1 (052313-1) PLENARY TALK**<br>**Femtosecond laser micro and nano engineering for photonics and biology**<br>E. Mazur, Harvard Univ., Division of Engineering and Applied Sciences, USA |
| **10:50** | **#Tu1-2 (050815-1) PLENARY TALK**<br>**Laser macro processing - Today and tomorrow**<br>E. Beyer, Fraunhofer IWS Dresden; Univ. of Technology Dresden, Germany |
| **11:30** | **#Tu1-3 (052618-1) PLENARY TALK**<br>**Laser developments for macro and micro demands**<br>K. Yasui, Mitsubishi Electric Corporation, Advanced R&D Center, Japan |

**LUNCH**

| **LPM SPECIAL SESSION L1-1<br>High Repetition Ultrafast Laser Processing<br>(Room 1(Science Hall), East District #1 Bldg., 4F)<br>(13:20-14:50, 90min.)** | | **LPM-01 Nanotechnology<br>(Room 2 (AV Room), East District #1 Bldg., 4F)<br>(13:30-15:00, 90min.)** | |
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| **TIME** | **Chair: P. R. Herman, Univ. of Toronto, Canada** | **TIME** | **Chair: Y. F. Lu, Univ. of Nebraska, USA** |
| **13:20** | **#Tu1-4 (12.1E) INVITED**<br>**Picosecond lasers for manufacturing**<br>R. Knappe, A. Nebel, B. Henrich, T. Herrmann, Lumera Laser GmbH, Germany | **13:30** | **#Tu2-1 (050950-1) INVITED**<br>**Photonic semiconductor one-dimensional nanostructures fabricated by femtosecond lasers**<br>S. S. Mao, Lawrence Berkeley National Laboratory and Univ. of California at Berkeley, USA |
| **13:50** | **#Tu1-5 (051906-1)**<br>**High repetition rate ultrafast lasers and their applications in micro machining**<br>H. P. Huber, Munich Univ. of Applied Science, Germany; S. Zoppel, J. Zehetner, R. Merz, Vorarlberg Univ.of Applied Sciences, Austria; M. Lederer, W. Seitz, D. Kopf, High Q Laser Production GmbH, Austria | **14:00** | **#Tu2-2 (050957-1)**<br>**Nano-lithography using high transmission nanoscale ridge apertures**<br>X. Xu, L. Wang, S. M. Uppuluri, A.X. Jin, Purdue Univ., School of Mechanical Engineering, USA |
| **14:10** | **#Tu1-6 (052323-1)**<br>**High-precision, high-throughput fusion welding of glass using femtosecond laser pulses**<br>I. Miyamoto, Osaka Univ., Japan; A. Horn, D. Wortmann, J. Gottmann, Lehrstuhle fuer Lasertechnik, RWTH-Aachen, Germany; F. Yoshino, IMRA America, Inc., USA | **14:20** | **#Tu2-3 (051910-1)**<br>**Selective area deposition of self-assembled monolayers of long-chain thiols on (001) GaAs**<br>J. J. Dubowski, X. Ding, Université de Sherbrooke, Canada; G. Marshall, Université de Sherbrooke, National Research Council Canada; F. Bensebaa, National Research Council Canada |
| **14:30** | **#Tu1-7(051859-1)**<br>**High energy-high repetition rate fiber laser system for precision micromachining with fundamental and second harmonic wavelengths**<br>F. Yoshino, J. Bovatsek, A. Arai, Y. Uehara, IMRA America, Inc. Applications Research Laboratory, USA | **14:40** | **#Tu2-4 (051305-1)**<br>**Nanomachining of inorganic transparent materials using laser plasma soft X-rays**<br>T. Makimura, H. Miyamoto, S. Uchida, T. Fujimori, Univ. of Tsukuba, Institute of Applied Physics, Japan; H. Niino, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology, Japan; K. Murakami, Univ. of Tsukuba, Institute of Applied Physics, Japan |
| **COFFEE BREAK** | | | |
| **LPM SPECIAL SESSION L1-2<br>Ultrafast Laser Processing Applications<br>(Room 1 (Science Hall), East District #1 Bldg., 4F)<br>(15:10-16:50, 100 min.)** | | **LPM-02 Nanofabrication<br>(Room 2 (AV Room), East District #1 Bldg., 4F)<br>(15:20-16:40, 80min.)** | |
| **TIME** | **Chair: E. Mazur, Harvard Univ., USA** | **TIME** | **Chair: S. Mao, Univ. of California at Berkeley, USA** |
| **15:10** | **#Tu1-8 (052702-1) INVITED**<br>**Femtosecond laser applications in analytical chemistry**<br>E. Mottay, Amplitude Systemes, France | **15:20** | **#Tu2-5 (051093-1)**<br>**Nanostructures generated by interfering femtosecond laser processing and their applications**<br>Y. Nakata, Osaka Univ., Institute of Laser Engineering, Japan |
| **15:40** | **#Tu1-9 (051551-1) INVITED**<br>**Femtosecond laser-assited micro-machining for display and optical device applications**<br>M. S. Lee, C. K. Min, Phoco Company, Information and Communications Univ., Republic of Korea | **15:40** | **#Tu2-6 (051826-1)**<br>**Sub-micron patterning using femtosecond laser surface modification**<br>W-S. Chang, K-S. Huh, J. Kim, S-H. Cho, K-H. Whang, Nano Machining Group, Korea Institute of Machinery & Materials, Republic of Korea |
| **16:10** | **#Tu1-10 (050722-1)**<br>**Improvement of productivity in structuring metals with ultra-short laser pulses**<br>S. Sommer, M. Kraus, Forschungsgesellschaft für Strahlwerkzeuge mbH (FGSW), Germany; F. Dausinger, Insitut für Strahlwerkzeuge (IFSW), Univ. of Stuttgart, Germany | **16:00** | **#Tu2-7 (051603-1)**<br>**Parallel sub-micron surface processing with laser irradiation through a microlens array**<br>M. H. Hong, Y. Lin, C.S. Lim, G.X. Chen, K.S. Tiaw, L.S. Tan, L.P. Shi, T. C. Chong, Data Storage Institute, Dept. Of Electrical and Computer Engineering, National Univ. of Singapore, Singapore |
| **16:30** | **#Tu1-11 (051629-1)**<br>**Auto power management system of femtosecond laser amplifier for industrial applications**<br>K. Takasago, T. Sumiyoshi, N. Nakata, T. Imahoko, N. Inoue, K. Yoshida, A. Nakamura, H. Sekita, Cyber Laser Inc., Japan | **16:20** | **#Tu2-8 (052008-1) STUDENT**<br>**Optical near-field based ablation of thin metal films by short-pulsed lasers**<br>D. Hwang, A. Chimmalgi, C. P. Grigoropoulos, Mechanical Engineering Department, Univ. of California, Berkeley, USA |
| **17:00** | **Short Presentation for Poster Session 1** **Chair: R. Stoian, Université Jean Monnet, France**<br>**(Room 1(Science Hall), East District #1 Bldg., 4F)** 3 Minute -1 View-chart Presentations | | |

| **LPM-03 Laser Crystallization**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(13:30-14:50, 80min.)** | | **HPL-01 Analysis of Process Phenomenon**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(13:30-14:40, 70min.)** | |
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| **TIME** | **Chair: M. Okoshi, National Defense Academy, Japan** | **TIME** | **Chair: M. Kutsuna, Nagoya Univ., Japan** |
| **13:30** | **#Tu3-1 (051031-1) STUDENT**<br>**Crystallization of amorphous Si layer on crystalline Si by femtosecond laser**<br>Y. Izawa, Institute of Laser Engineering, Osaka Univ., Japan; M. Fujita, Institute of Laser Technology, Japan; Y. Setsuhara, JWRI, Osaka Univ., Japan; Y. Izawa, Institute of Laser Engineering, Osaka Univ., Japan | **13:30** | **#Tu4-1 (051560-1) INVITED**<br>**Dynamic control of melt pool behavior using gas jet during CW Nd-Yag laser welding**<br>R. Fabbro, LALP (CNRS) / GIP GERAILP, France; S. Slimani, AIR LIQUIDE Company, France; F. Coste, LALP (CNRS) / GIP GERAILP, France; F. Briand, AIR LIQUIDE Company, France |
| **13:50** | **#Tu3-2 (051587-1)**<br>**Thin film transistors (TFTs) of poly silicon crystallized by double laser crystallization (2LaC) technique**<br>L. Xu, C. P. Grigoropoulos, T-J. King, Univ.of California, Berkeley, USA | **14:00** | **#Tu4-2 (051558-1)**<br>**The effect of welding parameters on keyhole behavior in $CO_2$-laser welding**<br>A. Salminen, A. Fellman, Lappeenranta Univ. of Technology, Laser Processing Laboratory, Finland |
| **14:10** | **#Tu3-3 (050967-1)**<br>**Rapid crystallization of silicon films by infrared laser**<br>T. Sameshima, M. Maki, N. Andoh, Tokyo Univ. of Agriculture and Technology, Japan; N. Sano, Hightec Systems Corporation, Japan | **14:20** | **#Tu4-3 (051259-1) STUDENT**<br>**Visualization of the assist gas flow in a laser cut kerf by two-tracer LIF technique**<br>H. Momiyama, A. Fukai, S. Yamaguchi, M. Endo, H. Horisawa, K. Nanri, T. Fujioka, Tokai Univ., Dept.of Physics and Aerospace, Japan |
| **14:30** | **#Tu3-4 (051847-2)**<br>**Advanced laser annealing techniques for creation of low temperature poly-silicon**<br>R. Paetzel, F. Simon, L. Herbst, Coherent Lambda Physik GmbH, Germany | | None |
| **COFFEE BREAK** | | | |
| **LPM-04 Surface Treatment & Modification**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(15:20-16:40, 80min.)** | | **HPL-02 Monitoring and Process Control**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(15:20-16:40, 80min.)** | |
| **TIME** | **Chair: S. Metev, BIAS, Germany** | **TIME** | **Chair: M. Kogel-Hollacher, Precitec KG, Germany** |
| **15:20** | **#Tu3-5 (051073-1)**<br>**Efficient high resolution 'cold' processing of green ceramic with a $CO_2$ laser**<br>K. M. Nowak, H. J. Baker, D. R. Hall, School of Engineering & Physical Sciences, Heriot-Watt Univ., UK | **15:20** | **#Tu4-4 (051537-1)**<br>**In-Process monitoring during laser beam welding**<br>C. Deininger, Institut für Strahlwerkzeuge (IFSW), Univ. of Stuttgart, Germany; J. Müller-Borhanian, Forschungsgesellschaft für Strahlwerkzeuge (FGSW), Germany ; F. Dausinger, Institut für Strahlwerkzeuge (IFSW), Univ. of Stuttgart, Germany |
| **15:40** | **#Tu3-6 (050798-1)**<br>**Laser modification of photosensitive glass**<br>V. P. Veiko, G. K. Kostyuk, A. N. Rachinskaya, St. Petersburg State Univ. of Information Technologies, Mechanics and Optics, Russia | **15:40** | **#Tu4-5 (051116-1)**<br>**Advanced process control in laser materials processing - Advantages in combining various sensor technologies**<br>M. Kogel-Hollacher, Precitec KG, Germany; K. Amano, Precitec Japan Ltd., Japan |
| **16:00** | **#Tu3-7 (051040-2)**<br>**Pulsed laser annealing of β-$FeSi_2$ microprecipitates-containing films**<br>A. Narazaki, T. Sato, Y. Kawaguchi, H. Niino, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan | **16:00** | **#Tu4-6 (052326-1)**<br>**In-process monitoring and adaptive control for laser spot and seam welding of pure titanium**<br>Y. Kawahito, M. Kito, S. Katayama, Joining and Welding Research Institute (JWRI), Osaka Univ., Japan |
| **16:20** | **#Tu3-8 (051849-2)**<br>**Laser surface texturing of bio-compatible materials under liquid environments**<br>C. B. Arnold, L. Ionescu, J. Chen, W. O. Soboyejo, Princeton Univ., USA | **16:20** | **#Tu4-7 (051707-1)**<br>**Intellligent laser processing in the automotive industry**<br>J-P. Boillot, CEO, Servo-Robot Group, Canada; F. Arsenault, Servo-Robot Inc., Canada; J. Noruk, Servo Robot Corp., USA; N. Torii, Servo Robot Japan Co., Ltd., Japan |
| **17:00** | **Short Presentation 1 for Poster Session 1** **Chair: R. Stoian, Université Jean Monnet, France**<br>**(Room 1(Science Hall), East District #1 Bldg., 4F)** 3 Minute -1 View-chart Presentations | | |

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| **18:00** | **Poster Session 1 (Atrium, East District, 1F) (18:00-19:30)**<br>1/2 of all posters will be up at Atrium, East District, 1F (Refreshments will be served.) |
| **LPM Poster: Diagnostics & Process Monitoring** | |
| | **#TuP-1 (051512-1) Poster Board #1**<br>**Designing a system for real time monitoring of a laser microprocessing**<br>N. Idris, Dept. of Physics, Faculty of Mathematics and Natural Sciences, Syiah Kuala Univ., Indonesia; K. Kagawa, Dept.of Physics, Faculty of Education and Regional Studies, Univ. of Fukui, Japan |
| | **#TuP-2 (050847-1) Poster Board #2**<br>**Quantitative analysis using laser ablation combined with inductively coupled plasma mass spectrometer**<br>Z. Wang, B. Hattendorf, D. Günther, Swiss Federal Institute of Technology Zürich, Switzerland |
| | **#TuP-3 (051875-1) STUDENT Poster Board #3**<br>**High speed and precision measurement of a large area surface using a hybrid type microscope with scanning confocal microscope and atomic force microscope**<br>J-B. Kim, N. Kwon, Hankuk Univ. of Foreign Studies, Republic of Korea; K-H. Kim, S-W. Moon, G-J. Nam, Institute for Advanced Engineering, Republic of Korea; W-H. Seo, Hyundae Tech. Co., Ltd., Republic of Korea |
| **LPM Poster: Analysis of Laser Ablation** | |
| | **#TuP-4 (051567-1) Poster Board #4**<br>**Mechanisms on laser milling of hard and brittle materials**<br>X. Zeng, G. Yuan, Q. Hu, Wuhan National Laboratory for Optoelectronics, National Engineering Research Center for Laser Processing, Huazhong Univ. of Science and Technology, China |
| | **#TuP-5 (051625-1) Poster Board #5**<br>**The analysis of ablation on ITO thin film for 1064nm irradiation**<br>J-H.Kim, LG electronics, Republic of Korea |
| **LPM Poster: Surface Treatment** | |
| | **#TuP-6 (050952-1) SHORT PRESENTATION Poster Board #6**<br>**Control of surface roughness of Si and Ge single crystal by laser radiation**<br>A. Medvids, P. Onufrijevs, D. Grabovskis, A. Mychko, Riga Technical Univ., Laboratory of Semiconductor Physics, Latvia |
| | **#TuP-7 (051626-1) Poster Board #7**<br>**Laser cleaning of particles with the aid of freezer/chilling plate**<br>M.H. Hong, Data Storage Institute, A*STAR, National Univ. of Singapore, Singapore; B.C. Lim, Data Storage Institute, A*STAR, Singapore; A. Kaur, National Univ. of Singapore, Singapore; L.P. Shi, Data Storage Institute, A*STAR, Singapore; T.C. Chong, Data Storage Institute, A*STAR, National Univ. of Singapore, Singapore |
| **LPM Poster: Micro Cutting & Drilling** | |
| | **#TuP-8 (050621-1) Poster Board #8**<br>**Micro cutting of thin copper plate by fiber laser with laval nozzle**<br>Y. Okamoto, Okayama Univ., Japan; N. Kataoka, Kataoka Corporation, Japan; H. Tahara, K. Shiwayama, Y. Uno, Okayama Univ., Japan |
| | **#TuP-9 (051913-1) STUDENT, SHORT PRESENTATION Poster Board #9**<br>**Scribing of alumina ceramics with short pulsed lasers**<br>D. J. Guo, Department of Mechanical Engineering, University of Fukui, Japan; S. Tomita, R. Tanaka, Fukui Industrial Support Center, Matsuura Machinery Corporation, Japan; T. Mizuno, Matsuura Machinery Corporation, Japan; T. Honda, Y. Iwai, Department of Mechanical Engineering, University of Fukui, Japan |
| | **#TuP-10 (051046-1) STUDENT SHORT PRESENTATION Poster Board #10**<br>**Time-resolving image analysis of drilling of materials with femtosecond laser ablation**<br>A. Yokotani, Y. Kanamitsu, H. Fukumoto, Dept. of Electrical and Electronic Engineering, Miyazaki Univ., Japan; K. Kurosawa, JST Satellite Miyazaki, Japan |
| | **#TuP-11 (051931-2) STUDENT Poster Board #11**<br>**Ti6Al4V sheets butt joints carried out by Nd:YAG laser: mechanical and morphological characterization**<br>T. Canel, E. Akman, A. Demir, S. Erturk, T. Sinmazcelik, O. Urhan, Laser Technologies Research and Application Center, Univ. of Kocaeli, Turkey |
| | **#TuP-12 (051430-1) STUDENT Poster Board #12**<br>**Analysis on resin removal in laser drilling of printed circuit board considering diffraction in image formation optical system**<br>S. Noguchi, E. Ohmura, Dept. of Manufacturing Science, Graduate School of Engineering, Osaka Univ., Japan |
| | **#TuP-13 (051216-1) STUDENT Poster Board #13**<br>**Fabrication of high-aspect-ratio microchannels using laser-assisted thermochemical wet etching**<br>K. H. Oh, M. K. Lee, S. H. Jeong, Dept. of Mechatronics, Gwangju Institute of Science and Technology, Republic of Korea |

## LPM Poster: Micro Bonding & Soldering

**#TuP-14 (051468-1) Poster Board #14**
**Direct bonding of glass and metal using short pulsed laser**
A. Utsumi, T. Ooie, Biodevice Team, Health Technology Research Center, AIST, Japan; T. Yano, M. Katsumura, Shikoku Collaboration Center, AIST, Japan

**#TuP-15 (051162-1) Poster Board #15**
**Study of the chip-on-glass bonding process by using a high power diode laser**
M-H. Seo, K-H. Ryu, G-J. Nam, Institute for Advanced Engineering, Republic of Korea

**#TuP-16 (051919-1) STUDENT SHORT PRESENTATION Poster Board #16**
**Effect of pre-heating of Pb-free, Sn-Zn-Bi solder pastes in laser soldering**
T. Eitoku, S. Nakahara, S. Hisada, S. Shingubara, T. Fujita, Graduate School of Kansai Univ., Japan

**#TuP-17 (051931-1) Poster Board #17**
**Optimization of Nd:YAG laser welding of magnesium**
A. Demir, E. Akman, T. Canel, S. Erturk, T. Sinmazcelik, O. Urhan, Laser Technologies Research and Application Center, Univ. of Kocaeli, Turkey

**#TuP-18 (051789-1) Poster Board #18**
**Study on high power $CO_2$ laser sintering for the mixture of metallic powder and diamond grits**
T. Xiahui, Q. Yingxiong, Z. Rutao, L. Zhengjia, National Engineering Research Center for Laser Processing, Huazhong Univ.of Science and Technology, China

## LPM Poster: Fabrication of Micro Components

**#TuP-19 (051137-1) STUDENT Poster Board #19**
**Fabrication process mechanism of microlenses using $CO_2$ laser**
T. Yamabe, H. Murotani, K. Nakamoto, M. Wakaki, Course of Optics and Photonics, Dept. of Applied Science, Tokai Univ., Japan

**#TuP-20 (051194-1) Poster Board #20**
**Microfabrication of metal molds for fine pitch electronic circuit using nanosecond pulse laser**
S. Nakamura, H. Togashi, Dept. of Electrical and Electronic Systems Engineering, Nagaoka College of Technology, Japan; Y. Ito, Dept. of Mechanical Engineering, Nagaoka Univ. of Technology, Japan

## LPM Poster: Fundamentals of Ultrafast Laser Processing

**#TuP-21 (051921-1) Poster Board #21**
**Characterization of ultrashort laser pulses by using the reflective Dammann gratings and lens**
E. Dai, C. Zhou, Information Optics Lab., Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Science, China

**#TuP-22 (051327-1) SHORT PRESENTATION Poster Board #22**
**Non-equilibrium hydrodynamical simulation of metal ablation by ultrashort laser pulses**
J.-P. Colombier, E. Audouard, Université Jean Monnet, Laboratoire TSI, France

**#TuP-23 (051165-1) STUDENT Poster Board #23**
**The influence of space-charge effects on the thermionic emission during femtosecond laser ablation of metals**
T. Balasubramani, Dept. of Mechatronics, Gwangju Institute of Science and Technology, Republic of Korea, J.M. Lee, Advanced Photonics Research Institute, Gwangju Institute of Science and Technology, Republic of Korea; S. H. Jeong, Dept. of Mechatronics, Gwangju Institute of Science and Technology, Republic of Korea

**#TuP-24 (051335-2) Poster Board #24**
**Thermal effects in nano-/femto-second laser fabrication**
S. Juodkazis, Research Institute for Electronic Science, Hokkaido Univ., Japan; M. Li, Spectra-Physics, USA; E. Vanagas, Laser Systems, Inc., USA; H. Misawa, Research Institute for Electronic Science, Hokkaido Univ., Japan

**#TuP-25 (051510-1) Poster Board #25**
**Formation of femtosecond laser-induced initial surface modification on silicon in liquid Kerr media**
N. Mansour, R. Karimzadeh, Dept. of Physics, Shahid Beheshti Univ., Tehran, Iran

**#TuP-26 (051504-1) Poster Board #26**
**Formation of laser-induced periodic surface structures on Al with Femtosecond Laser Pulses**
S-C. Choi, Y-L. Lee, Y-C. Noh, D-K. Ko, J. Lee, Advanced Photonic Research Institute (APRI), Gwangju Institute of Science and Technology (GIST), Republic of Korea

**#TuP-27 (051846-1) SHORT PRESENTATION Poster Board #27**
**Characterization of femtosecond pulsed laser-induced ripple structure in semiconductor materials by using of micro-optical spectroscopy**
M. Yamaguchi, S. Ueno, Technical Research Institute JAPAN Society for The Promotion of Machine Industry, Japan; K. Kinoshita, T. Murai, T.Tomita, S. Matsuo, S. Hashimoto, Dept. of Ecosystem Engineering, The Univ. of Tokushima, Japan

**#TuP-28 (051437-2) Poster Board #28**
**Femtosecond laser ablation of metals and crater formation**
B. Oh, D. Kim, Dept. of Mechanical Engineering, POSTECH, Republic of Korea; J. Kim, J-H. Lee, Nanoprocess Group, KIMM, Republic of Korea

**#TuP-29 (050762-1) Poster Board #29 STUDENT**
**Femtosecond laser ablation of Zr-based bulk metallic glasses**
K. Takahashi, T. Sano, A. Hirose, K. F. Kobayashi, Graduate School of Engineering, Osaka Univ., Japan

**#TuP-30 (050762-2) Poster Board #30 STUDENT**
**Femtosecond laser synthesis of the high-pressure phases of titanium**
K. Takahashi, T. Sano, K. Yamamoto, Graduate School of Engineering, Osaka Univ., Japan; O. Sakata, Japan Synchrotron Radiation Research Institute / SPring-8, Japan; A. Hirose, K. F. Kobayashi, Graduate School of Engineering, Osaka Univ., Japan

**#TuP-31 (051893-1) Poster Board #31**
**Effects of pulse delay in metal micromachining with femtosecond pulse laser**
J. Kim, K. Nam, S. Cho, W. Chang, Nano-Mechanical System Research Center, Korea Institute of Machinery & Materials, Republic of Korea, S. Na, Dept.of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Republic of Korea, K. Whang, Nano-Mechanical System Research Center, Korea Institute of Machinery & Materials, Republic of Korea

**#TuP-32 (051917-1) STUDENT SHORT PRESENTATION Poster Board #32**
**The study on the glass crystallization using femtosecond laser pulse and it's mechanism**
K. T. Lee, P. Y. Moon, D. K. Yoon, B. K. Ryu, School of Material Science and Engineering, Pusan National Univ., Republic of Korea; B. H. Yoo, S. H. Cho, Nano Machining Group, Korea Institute of Machinery and Materials, Republic of Korea

## LPM Poster: SP L1 The Future of Ultrashort Laser Manufacturing

**#TuP-33 (051207-1) Poster Board #33**
**Femtosecond laser patterning of ITO film for display panel**
I-B. Sohn, S-C. Choi, Y-C. Noh, D-K. Ko, J. Lee, Advanced Photonics Research Institute, GIST, Republic of Korea

**#TuP-34 (051571-3) SHORT PRESENTATION Poster Board #34**
**Scribing of thin and thick films for electronic applications with ultrashort laser pulses**
K. Zimmer, D. Ruthe, Leibniz-Institute for Surface Modification, Germany; A. Braun, Solarion GmbH, Germany; R. Böhme, B. Rauschenbach, Leibniz-Institute for Surface Modification, Germany

**#TuP-35 (051327-2) SHORT PRESENTATION Poster Board #35**
**Spatial beam shaping for ultrafast laser processing**
N. Sanner, N.Huot, E. Audouard, Université Jean Monnet, Laboratoire TSI, France

**#TuP-36 (051509-1) STUDENT SHORT PRESENTATION Poster Board #36**
**Femtosecond laser processing system with target tracking feature**
A. Takita, Y. Hayasaki, N. Nishida, Dept. of Optical Science & Technology, The Univ. of Tokushima, Japan

**#TuP-37 (3.23E) SHORT PRESENTATION Poster Board #37**
**High energy and high repetition rate femtosecond laser system**
G. Matras, Université Jean Monnet, Laboratoire TSI, Thalès Laser S.A., France; E. Baubeau, Thalès Laser S.A., France; E. Audouard, N. Huot, Université Jean Monnet, Laboratoire TSI, France

## HPL Poster:

**#TuP-39 (050747-1) STUDENT Poster Board #39**
**Laser ablation plume spectroscopy for elemental analysis of electrodeposited Cu**
H. Oguchi, T. Sakka, S. Masai, Y. H. Ogata, Institute of Advanced Energy, Kyoto Univ., Japan

**#TuP-40 (051868-1) Poster Board #40**
**R&D of gas-based laser plasma sources toward material processing**
K. Murai, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**#TuP-41 (051114-2) STUDENT Poster Board #41**
**Study of hole properties in percussion regime with innovative source : geometry, quality and reproducibility**
M. Schneider, R. Fabbro, L. Berthe, M. Muller, M. Jeandin, M. Nivard, Laboratoire pour l 'Application des Lasers de Puissance (UPR CNRS 1578), France

**#TuP-42 (053860-1) Poster Board #42**
**Characteristics of high speed welding by fiber laser**
S. J. Park, M. Y. Lee, Research Institute of Industrial Science & Technology, Republic of Korea ; C. Y. Kang, Pusan National Univ., Republic of Korea ; W. S. Chang, Research Institute of Industrial Science & Technology, Republic of Korea

**#TuP-43 (051927-1) SHORT PRESENTATION Poster Board #43**
**The weldability of 6mm $^{t}$ Zn-riched primer coated steel for shipbuilding by $CO_2$ laser**
J. D. Kim, H. J. Park, Korea Maritime University, Division of Marine System Engineering, Republic of Korea; M. Y. Lee, Sungwoo Hitech, Republic of Korea:; S. Katayama, A. Matsunawa, Joining and Welding Research Institute, Osaka Univ., Japan

**#TuP-44 (051812-1) Poster Board #44**
**Robot based 3-dimensional laser welding technology**
H. S. Kang, J. Suh, J. H. Lee, M. Y. Lee, B. H. Jung, Korea Institute of Machinery & Materials (KIMM), Sungwoo Hitech Co., Ltd., Republic of Korea

**#TuP-45 (050850-1) Poster Board #45**
**YAG laser -TIG hybrid welding of 800MPa-class high tensile strength steel**
Y. Mitooka, K. Murakami, M. Hino, Industrial Technology Research Institute of Okayama Prefectural Government, Japan; H. Iogawa, H. Ono, H. Goto, ASTEER Co., Ltd., Japan; S. Katayama, Joining and Welding Research Institute, Osaka Univ., Japan

**#TuP-46 (3.27E) SHORT PRESENTATION Poster Board #46**
**The effect of plasma formation in welding with a 400W Nd:YAG pulsed laser**
M. J. Torkamany, Paya Partov Industrial & Medical Laser Company, Iran; M.J. Hamedi, F. Malek, Metallurgical Engineering Group of Tarbiyat Modarres Univ., Iran, J. Sabbaghzadeh, Laser Research Centre, AEOI, Paya Partov Industrial & Medical Laser Company, Tehran, Iran

# DAY-2: MAY 17, 2006, WEDNESDAY

**Events: 4 parallels and Poster Session**

## LPM SPECIAL SESSION L2-1
## Fundamental Issues in Laser Direct-Write
**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(9:00-10:30, 90min.)**

| TIME | Chair: A. Piqué, Naval Research Laboratory, USA |
|---|---|
| 9:00 | **#We1-1 (051864-1) INVITED**<br>**Tailoring light pulses for optimal laser processing and material modification applications**<br>F. E. Livingston, H. Helvajian, Micro/Nanotechnology Dept., Space Materials Laboratory, The Aerospace Corporation, USA |
| 9:30 | **#We1-2 (051849-1)**<br>**Modifications of electrochemical materials during laser direct-write deposition**<br>G. Wei, C. B. Arnold, Dept.of Mechanical and Aerospace Eng., Princeton Univ., USA |
| 9:50 | **#We1-3 (051215-1)**<br>**Space-selective precipitation of Ge nanoparticles by irradiation with excimer laser**<br>H. Nishiyama, Y. Hirata, I. Miyamoto, Graduate School of Engineering, Osaka Univ., J. Nishii, National Institute of Advanced Industrial and Science Technology, Japan |
| 10:10 | **#We1-4 (052419-1)**<br>**Resolution and control in laser-direct-write-patterned photostructurable glass**<br>H. Helvajian, The Aerospace Corporation, USA; J. Stillman, Univ. of California, Los Angeles, USA |

## LPM-05 Ultrafast Laser Processing
## – Theory & Dynamics -
**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(9:00-10:30, 90min.)**

| TIME | Chair: Y. Ito, Nagaoka Univ. of Technology, Japan |
|---|---|
| 9:00 | **#We2-1 (050826-1) INVITED**<br>**Theoretical models and qualitative interpretations of fs material processing**<br>N .M. Bulgakova, I. M. Burakov, Institute of Thermophysics SB RAS, Russia; Y. P. Meshcheryakov, Design and Technology Branch of of Lavrentyev Institute of Hydrodynamics SB RAS, Russia; R. Stoian, Université Jean Monnet, France; A. Rosenfeld, I. V. Hertel, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany |
| 9:30 | **#We2-2 (051890-1)**<br>**Diagnostics of laser-induced melting of matter by ultra-fast metrology**<br>A. Horn, I. Mingareev, Lehrstuhl für Lasertechnik, Aachen, Germany; I. Miyamoto, Osaka Univ., Japan |
| 9:50 | **#We2-3 (051253-1)**<br>**Density, temperature and pressure dynamics in the bulk modification by femtosecond laser irradiation**<br>M. Sakakura, K. Miura, M. Terazima, K. Hirao, Kyoto Univ., Japan |
| 10:10 | **#We2-4 (051312-1)**<br>**Time-resolved imaging of energy relaxation in transparent materials irradiated by ultrashort laser pulses**<br>A. Mermillod-Blondin, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany; Université Jean Monnet, France; I . M. Burakov, Institute of Thermophysics SB RAS, Russia; R. Stoian, Université Jean Monnet, France ; L. Ehrentraut, A. Rosenfeld, M. Boyle, A. Husakou, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany; N. M. Bulgakova, Institute of Thermophysics SB RAS, Russia; E. Audouard, Université Jean Monnet, France ; I. V. Hertel, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany |

**COFFEE BREAK**

## LPM SPECIAL SESSION L2-2
## Laser Direct-Write of Optical Materials
**(Room 1(Science Hall), East District #1 Bldg., 4F)**
**(10:40-12:10, 90min.)**

| TIME | Chair: C. B. Arnold, Princeton Univ., USA |
|---|---|
| 10:40 | **#We1-5 (050794-1) INVITED**<br>**2D and 3D photofabrication with fs lasers for applications in photonics and biomedicine**<br>B. N. Chichkov, Laser Zentrum Hannover e.V., Germany |
| 11:10 | **#We1-6 (051575-1)**<br>**Integrated design of embedded optical interconnect for direct laser process**<br>K. Yasuda, K. Ohta, M. Nakamura, M. Matsushima, K. Fujimoto, Dept. of Materials and Manufacturing Science, Osaka Univ., Japan |
| 11:30 | **#We1-7 (051529-1)**<br>**Laser direct write of active thin-films on glass for industrial flat panel display manufacture**<br>M.Henry, P. M. Harrison, J. Wendland, Powerlase Ltd., UK |
| 11:50 | **#We1-8 (050739-1)**<br>**Crack-free micromachining on glass using an economic nanosecond green laser for manufacturing microfluidic chip**<br>J-Y. Cheng, Research Ctr.for Applied Sciences, Academia Sinica, Taiwan; M-H. Yen, Research Center for Applied Sciences, Academia Sinica, Taiwan, National Taiwan Univ., Taiwan; T-H. Young, National Taiwan Univ., Taiwan |

## LPM-06 Ultrafast Laser Processing
## – Fundamentals -
**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(10:50-12:10, 80min.)**

| TIME | Chair: X. Xu, Purdue Univ., USA |
|---|---|
| 10:50 | **#We2-5 (050996-1) STUDENT**<br>**Influence of heat accumulation on surface microstructuring during femtosecond pulsed laser ablation**<br>M. Groenendijk, J. Meijer, Univ.of Twente, The Netherlands |
| 11:10 | **#We2-6 (051316-1)**<br>**Transient surface instability induced by femtosecond laser pulses**<br>J. Reif, F. Costache, O. Varlamova, S. Eckert, LS Experimentalphysik II, Brandenb. Tech. U Cottbus; IHP/BTU JointLab, Germany |
| 11:30 | **#We2-7 (050757-1)**<br>**UV-IR femtosecond laser-induced damage in fused silica and $CaF_2$ crystals**<br>T.Q. Jia, H. Kuroda, The Institute for Solid State Physics, Univ. of Tokyo, Japan |
| 11:50 | **#We2-8 (051325-1)**<br>**Optimization of laser-induced structural modifications in dielectric materials**<br>A. Mermillod-Blondin, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie,Germany, Université Jean Monnet, France ; R. Stoian, Université Jean Monnet, France ; I.M. Burakov, Institute of Thermophysics SB RAS, Russia; A. Rosenfeld, M. Boyle, A. Husakou, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany; N. M. Bulgakova, Institute of Thermophysics SB RAS, Russia; E. Audouard, Université Jean Monnet, France ; I. V. Hertel, Max-Born-Institut für Nichtlineare Optik und Kurzzeitspektroskopie, Germany |

**LUNCH TIME**

| **LPM-09 Nanomaterials Synthesis**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(9:00-10:30, 90min.)** | | **HPL-04 Welding 1**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(9:00-10:30, 90min.)** | |
|---|---|---|---|
| **TIME** | **Chair: J. Dubowski, Université deSherbrooke, Canada** | **TIME** | **Chair: K. Mikame, Toyota Motor Corporation, Japan** |
| **9:00** | **#We3-1 (051584-1) INVITED**<br>**Sp³-bonded 5H-BN films grown by plasma-assisted laser CVD for electron field emitter applications: its growth mechanism and the FE properties**<br>S. Komatsu, Advanced Materials Laboratory, National Institute for Materials Science, Japan | **9:00** | **#We4-1 (052699-1) INVITED**<br>**A novel method for lap welding of automotive sheet steel using high power CW $CO_2$ laser**<br>J. Mazumder, A. K. Dasgupta, Center for Laser Aided Intelligent Manufacturing, Univ. of Michigan, USA |
| **9:30** | **#We3-2 (051007-1) STUDENT**<br>**Optical characteristics of ZnO nanowires synthesized by laser-ablation and its application to ultraviolet photo-detector**<br>M. Ueda, K. Kawashima, M. Higashihata, T. Okada, Kyushu Univ., Japan | **9:30** | **#We4-2 (051688-1)**<br>**Aspects of remote welding with $CO_2$-lasers - Shielding gas effects and distortion minimisation**<br>C. Thomy, S. Neumann, T. Seefeld, F. Vollertsen, BIAS Bremer Institut für angewandte Strahltechnik GmbH, Germany |
| **9:50** | **#We3-3 (051160-2)**<br>**Control of morphology and optical gap of Si nanocrystallites prepared by pulsed laser ablation**<br>I. Umezu, I. Kondo, M. Inada, T. Makino, A. Sugimura, Dept.of Physics, Konan Univ., Japan | **9:50** | **#We4-3 (051938-1)**<br>**Hardness of laser welded AHSS with a strength over 600MPa for automotive**<br>C-Y. Kang, T-K. Han, B-K Lee, Dept. of Material Science and Engineering, Pusan National Univ., Republic of Korea |
| **10:10** | **#We3-4 (051905-1)**<br>**Continues production of the oxide nanoparticles in flow cell by pulsed laser ablation in liquid**<br>T. Sasaki, M. Ito, Y. Shimizu, N. Koshizaki, Nanoarchitectonics Research Center, National Institute of Advanced Industrial Science and Technology, Japan | **10:10** | **#We4-4 (051840-1)**<br>**Determination of optimum welding parameters on the laser welded spacer grid assembly for PWRS**<br>K-N. Song, S-S. Kim, Korea Atomic Energy Research Institute, Republic of Korea |
| **COFFEE BREAK** | | | |
| **LPM-10 Nanomaterials Treatment**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(10:50-12:10, 80min.)** | | **HPL-05 Welding 2**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(10:45-12:15, 90min.)** | |
| **TIME** | **Chair: V. Veiko, St.Petersburg Univ. of Information Tehnologies, Russia** | **TIME** | **Chair: J. Mazumder, Univ. of Michigan, USA** |
| **10:50** | **#We3-5 (051508-1) STUDENT**<br>**Crystal growth control of organic and protein molecules by focused femtosecond laser irradiation**<br>H. Y. Yoshikawa, Dept.of Applied Physics and Venture Business Lab., Osaka Univ., Japan; Y. Hosokawa, H. Masuhara, Dept.of Applied Physics and Venture Business Lab., Osaka Univ., Japan, CREST JST, Japan | **10:45** | **#We4-5 (051745-1) INVITED**<br>**The effect of spot size and beam parameter product when welding aluminium and steel with high power fibre delivered laser beams**<br>P. A. Hilton, G. Verhaeghe, B. Dance, TWI Ltd., UK |
| **11:10** | **#We3-6 (052008-2) STUDENT**<br>**Nanoscale rapid melting and crystallization of amorphous silicon thin films by optical near-fieldd probes**<br>D. J. Hwang, A. Chimmalgi, C. P. Grigoropoulos, Mechanical Engineering Dept., Univ. of California Berkeley, USA | **11:15** | **#We4-6 (051856-2)**<br>**Improvement of weld quality via the application of electromagnetic force in laser welding**<br>H. L. Tsai, J. Zhou, Univ.of Missouri-Rolla, USA; P. C. Wang, GM R&D Center, USA |
| **11:30** | **#We3-7 (050746-1)**<br>**Surface treatment of polymers by simultaneous exposure to VUV and nanometer-sized particles**<br>H. Azuma, T. Narita, A. Takeuchi, N. Kamiya, T. Ito, M. Kato, K. Tachi, T. Motohiro, TOYOTA Central Research and Development Laboratories, Inc., Japan | **11:35** | **#We4-7 (051688-2)**<br>**Application of alternating magnetic fields in laser welding of aluminium**<br>C. Thomy, F. Vollertsen, BIAS-Bremer Institut für angewandte Strahltechnik GmbH, Germany |
| **11:50** | **#We3-8 (051493-1)**<br>**Thin films of polyaniline deposited by MAPLE technique**<br>M. Dinescu, NILPRP, Romania; C. Constantinescu, A. Moldovan, N-D. Scarisoreanu, I. Valentin, National Institute for Lasers, Plasma and Radiation Physics (NILPRP), Romania; M. Bercu, Faculty of Physics, Univ. of Bucharest, Romania | **11:55** | **#We4-8 (051879-1)**<br>**Effect of filler wire for the weld characteristic and weld parameters optimization in Nd:YAG laser welding of aluminum alloy**<br>C. Lee, Seoul National Univ. of Technology, Republic of Korea; Y-W. Park, S. Rhee, Hanyang Univ., Republic of Korea |
| **LUNCH TIME** | | | |

| **LPM SPECIAL SESSION L2-3**<br>**Laser Direct-Write Applications**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(13:10-15:00, 110min.)** | | **LPM-07 Ultrafast Laser Processing**<br>**- Ablation -**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(13:40-15:00, 80min.)** | |
|---|---|---|---|
| **TIME** | **Chair: A. Ostendorf, Laser Zentrum Hannover e.V., Germany** | **TIME** | **Chair: W. Kautek, Univ. of Vienna, Austria** |
| **13:10** | **#We1-9 (051320-1) INVITED**<br>**Laser-induced forward transfer: a direct writing technique for biosensors preparation**<br>P. Serra, J. M. Fernandez-Pradas, M. Colina, M. Duocastella, J. L. Morenza, Universitat de Barcelona, Dept. de Fisica Aplicada i Optica, Spain | **13:40** | **#We2-9 (051471-1)**<br>**Dependence of number of laser pulses on microstructure formation by femtosecond laser irradiation**<br>K. Asuka, Graduate School of Engineering, Osaka Univ., Japan; M. Tsukamoto, JWRI, Osaka Univ., Japan; H. Nakano, School of Science and Engineering, Kinki Univ., Japan; M. Fujita, Institute for Laser Technology, Japan; N. Abe, JWRI, Osaka Univ., Japan; M. Hashida, Institute for Chemical Research, Kyoto Univ., Japan; M. Katto, Cooperative Research Center, Miyazaki Univ., Japan |
| **13:40** | **#We1-10 (052308-2)**<br>**Laser direct-write of metallic nanoparticle inks**<br>R. C. Auyeung, Materials Science and Technology Div., Naval Research Laboratory, USA; M. Mastropietro, PChem Associates, Inc., USA; S. A. Mathews, Dept. of Electrical Engineering, The Catholic University of America, USA; A. Piqué, Materials Science and Technology Div., Naval Research Laboratory, USA | **14:00** | **#We2-10 (051353-1) STUDENT**<br>**Experimental investigation on femto-second laser ablation of thin metal films**<br>H-G. Shin, Kangwon National Univ., Republic of Korea; J-K. Lee, Korea Polytechnic Univ., Republic of Korea; B-H. Kim, Kangwon National Univ., Republic of Korea; S-C. Jeoung, Korea Research Institute of Standards & Science, Republic of Korea |
| **14:00** | **#We1-11 (052308-1)**<br>**Use of laser direct-write in microelectronics fabrication**<br>A.Piqué, H. Kim, R. C. Auyeung, Materials Science and Technology Div., Naval Research Laboratory, USA; S. A. Mathews, Dept. of Electrical Engineering, The Catholic University of America, USA | **14:20** | **#We2-11(050659-1) STUDENT**<br>**Femtosecond laser machining of Gallium arsenide wafers for the creation of quasi-phasematched devices**<br>S. Campbell, E. Ramsey, D. P. Hand, D. T. Reid, Heriot Watt Univ., School of Engineering and Physical Sciences, UK |
| **14:20** | **#We1-12 (051550-1)**<br>**Laser-driven micropump produced by femtosecond laser direct writing**<br>S. Maruo, H. Inoue, Graduate School of Engineering, Yokohama National Univ., Japan | **14:40** | **#We2-12 (051894-1)**<br>**Measurement and analysis of the deep drilling of crystalline silicon with femtosecond laser pulses**<br>T. Nakatani, Physics Dept., Tokai Univ., Japan; T. Matsumura, Suruga Seiki Co. Ltd., Japan, T. Yagi, Physics Dept., Tokai Univ., Japan |
| **14:40** | **#We1-13 (2.17E)**<br>**Direct laser sintering of thick film microelectronics**<br>E. C. Kinzel, X. Xu, School of Mechanical Engineering, Purdue Univ., USA | | None |
| **COFFEE BREAK** | | | |
| **LPM-12 Micromachining**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(15:10-16:50, 100min.)** | | **LPM-08 Ultrafast Laser Processing - Nanostructuring**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(15:20-16:40, 80min.)** | |
| **TIME** | **Chair: H. Niino, AIST, Japan** | **TIME** | **Chair:J. Reif, Brandenb.Tech.Univ. Cottbus, Germany** |
| **15:10** | **#We1-14 (051847-1)**<br>**Laser micromachining with high power excimer laser**<br>L. Herbst, R. Paetzel, Coherent Lambda Physik GmbH, Germany | **15:20** | **#We2-13 (052042-1)**<br>**Fabrication of sub-wavelength-period nanostructures with UV femtosecond laser ablation**<br>J-H. Klein-Wiele, Laser Laboratorium Göttingen e. V., Germany |
| **15:30** | **#We1-15 (051106-1)**<br>**Efficient micromachining of partially stabilised zirconia ceramic using nanosecond laser pulses**<br>D. P. Hand, X. Wang, J. D. Shephard, F. C. Dear, School of Engineering and Physical Sciences, Heriot-Watt Univ., UK | **15:40** | **#We2-14 (050757-2)**<br>**Formation of nanogratings on the surface of ZnSe crystal irradiated by femtosecond laser pulses**<br>T.Q. Jia, H. Kuroda, The Institute for Solid State Physics, Univ. of Tokyo, Japan |
| **15:50** | **#We1-16 (051903-1) STUDENT**<br>**Hybrid Laser-Assisted Mechanical Micromachining (LAMM) process for hard-to-machine materials**<br>R. Singh, S. N. Melkote, George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, USA | **16:00** | **#We2-15 (051899-1)**<br>**Investigation of ripples with sub-wavelength periodicity induced by tightly focused femtosecond laser radiation on various materials**<br>J. Gottmann, R. Wagner, Lehrstuhl für Lasertechnik, RWTH Aachen, Germany |
| **16:10** | **#We1-17 (051907-1) STUDENT**<br>**Improved surface finish and aspect ratio during laser ablation**<br>L. Ç. Özcan, V. Tréanton, R. Kashyap, L. Martinu, Dept. of Engineering Physics and Electrical Engineering, Ecole Polytechnique de Montreal, Canada | **16:20** | **#We2-16 (051220-1)**<br>**Femtosecond laser-induced ripple structures in semiconductor materials**<br>T. Tomita, K. Kinoshita, T. Murai, Y. Fukumori, S. Matsuo, S. Hashimoto, Dept. of Ecosystem Engineering, The Univ. of Tokushima, Japan |
| **16:30** | **#We1-18 (051886-1)**<br>**Investigation on laser micro ablation of steel using short and ultrashort IR multipulses**<br>C. Hartmann, T. Fehr, A. Gillner, C. Gehlen, Ü. Aydin, R. Noll, Fraunhofer Institut für Lasertechnik, Germany | | None |
| **17:00** | **Short Presentation 2 for Poster Session 2** **Chair: S.-H. Cho, KIMM, Korea**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)** 3 Minute -1 Viewchart Presentations | | |

| **LPM-11 Microdrilling & Cutting**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(13:50-14:50, 60min.)** | | **HPL-06 Welding 3**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(13:30-15:00, 90min.)** | |
|---|---|---|---|
| **TIME** | **Chair: T. Ooie, AIST, Japan** | **TIME** | **Chair: S. Tsukamoto, National Institute for Materials Science, Japan** |
| **13:50** | **#We3-9 (051185-1)**<br>**Mechanism of micro drilling process in metal foil**<br>T. Arai, T. Iwamoto, Chuo Univ., Japan | **13:30** | **#We4-9 INVITED (3.31E)**<br>**Diagnostic and prevention of laser weld defects**<br>F. Dausinger, Forschungsgesellschaft für Strahlwerkzeuge (FGSW), Germany |
| **14:10** | **#We3-11 (051763-1)**<br>**A study on the influence of process parameters on the part quality in cutting of CSP 1N sheet using high power CW Nd:YAG laser for net shape manufacturing**<br>D. G. Ahn, Dept. of Mechanical Eng., Chosun Univ., Republic of Korea; H. J. Park, Dept. of Industrial Eng., Chosun Univ., Republic of Korea, Y. T. Yoo, Dept. of Mechatronics Eng., Chosun Univ., Republic of Korea | **14:00** | **#We4-10 (052312-1)**<br>**Arc plasma and plume behavior, and melt flows in molten pool during YAG laser -TIG arc hybrid welding**<br>Y. Naito, M. Mizutani, S. Katayama, Joining and Welding Research Institute, Osaka Univ., Japan; F. Briand, AIR LIQUIDE, France |
| **14:30** | **#We3-12 (051636-1)**<br>**Precision material processing with fiber delivered Nd: YAG lasers**<br>M. Naeem, C. Grafton-Reed, GSI Group, Laser Div., UK | **14:20** | **#We4-11 (051688-3)**<br>**Dynamic arc behaviour in $CO_2$-laser GMA hybrid welding**<br>C. Thomy, BIAS-Bremer Institut für angewandte Strahltechnik GmbH, Germany |
| | None | **14:40** | **#We4-12 (4.12E)**<br>**Weldability evaluation of laser & hybrid welding for high strength stainless steels**<br>H. Yamaoka, I. Kawaguchi, Ishikawajima-Harima Heavy Industries, Co., Ltd.(IHI), Japan; K. Nishimoto, H. Mori, Osaka Univ., Japan; S. Tsuge, Nippon Steel & Sumikin Stainless Steel Corporation, Japan; H. Inoue, Nippon Steel Corporation, Japan |
| **COFFEE BREAK** | | | |
| **HPL-03 Material Removal**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(15:20-16:40, 80min.)** | | **HPL-07 Welding 4**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(15:20-16:20, 60min.)** | |
| **TIME** | **Chair: T. Arai, Chuo Univ., Japan** | **TIME** | **Chair: F. Briand, AIR LIQUIDE/CTAS, France** |
| **15:20** | **#We3-13 (051114-1) STUDENT**<br>**New experimental approach to study laser matter interaction during drilling in percussion regime**<br>M. Schneider, R. Fabbro, L. Berthe, M. Muller, M. Nivard, Laboratoire pour l 'Application des Lasers de Puissance, France | **15:20** | **#We4-13 (051265-1)**<br>**New investigations on aluminum-steel joining with Nd:YAG laser**<br>P. Peyre, GERAILP-LALP, France; G. Sierra, CEA/DRT/DTEN /GERAILP, France, LMGC, Univ. Montpellier II, France; F. Deschaux-Beaume, Univ. Montpellier II, France; D. Stuart, GERAILP-LALP, France; G. Fras, LMGC, Univ. Motpellier II, France |
| **15:40** | **#We3-14 (051889-1)**<br>**Process development and control for laser drilled and shaped holes in turbine components**<br>A. Horn, E. W. Kreutz, L. Trippe, K. Walther, R. Poprawe, RWTH Aachen LLT, Fraunhofer ILT, Germany | **15:40** | **#We4-14 (051895-2)**<br>**Laser roll welding of dissimilar metal joint of zinc coated steel and aluminum alloy**<br>H. Ozaki, M. Kutsuna, Graduate School of Engineering, Nagoya Univ., Japan; S. Nakagawa, K. Miyamoto, Research Center, Nissan Motor Co., Ltd., Japan |
| **16:00** | **#We3-15 (051897-1)**<br>**Laser cutting of particleboards and high- and medium-density fibreboards**<br>V. Kujanpää, H. Malmberg, F. Qiu, Lappeenranta Univ. of Technology, Finland | **16:00** | **#We4-15 (051421-1)**<br>**Laser welding of Ta sheath thermocouple wire for instrumented fuel irradiation test**<br>S. Kim, Korea Atomic Energy Research Institute, Dept. of Dry Process Nuclear Fuel Development, Republic of Korea |
| **16:20** | **#We3-16 (050846-1) STUDENT**<br>**Techniques and limits in processing of bio-implantable zirconia ceramics using millisecond pulsed lasers**<br>F. C. Dear, J. D. Shephard, X. Wang, J. D. C. Jones, D. P. Hand, School of Engineering & Physical Sciences, Heriot Watt Univ., UK | | None |
| **17:00** | **Short Presentation 2 for Poster Session 2** **Chair: Chair: S.-H. Cho, KIMM, Korea**<br>**(Room 1(Science Hall), East District #1 Bldg., 4F)** 3 Minute -1 Viewchart Presentations | | |

**18:00** **Poster Session 2 (Atrium, East District, 1F) (18:00-19:30)**
1/2 of all posters will be up at Atrium, East District, 1F (Refreshments will be served)

## LPM Poster: Optical Systems & Light Sources

**#WeP-1 (051043-1) Poster Board #1**
**An advanced motion controller for galvanometer-based optical scanners**
C-W. Cheng, W-P. Tseng, ITRI SOUTH, Industrial Technology Research Institute, Taiwan

**# WeP-2 (12.28E) Poster Board #2**
**High peak power pulse amplification using polarization maintaining double clad fiber**
H. Sunaga, Dept. of Physics, Tokai Univ., Japan; K. Jyosui, Institute for Applied Optics, Japan; Y. Minoshima, Dept. of Physics, Tokai Univ., Japan; K. Tei, Dept. of Physics, Tokai Univ., Japan, Institute for Applied Optics, Japan; S. Yamaguchi, Dept. of Physics, Tokai Univ., Japan; T. Fujioka, Dept. of Physics, Tokai Univ., Japan, Institute for Applied Optics, Japan; K. Nanri, Dept. of Physics, Tokai Univ., Japan

**#WeP-3 (1) Poster Board #3**
**High-spatial coherence excimer laser for mass production of fiber Bragg gratings**
R. Delmdahl, B. Fechner, Coherent Lambda Physik GmbH, Germany

**# WeP-4 (12.16E) Poster Board #4**
**Plasma sources of short-wave radiation**
A. F. Nastoyashchiy, RF SRC Troitsk Institute for Innovation and Fusion Research, Russia

**#WeP-5 (12.16E) Poster Board #5**
**An electric field effect upon the electron energy transfer in the laser plasma corona**
A. F. Nastoyashchiy, RF SRC Troitsk Institute for Innovation and Fusion Research, Russia

## LPM Poster: Synthesis of Advanced & Nano Materials

**#WeP-6 (050778-1) Poster Board #6**
**Dielectric properties of Ba(Zr,Ti)$O_3$ thin films fabricated by pulsed laser deposition**
T. Hino, Niihama National College of Technology, Japan; M. Nishida, T. Araki, Ehime Univ., Japan; T. Ohno, T. Kawahara, M. Murasugi, H. Tabata, T. Kawai, Osaka Univ., Japan

**#WeP-7 (051905-2) SHORT PRESENTATION Poster Board #7**
**Synthesis of small ZnO nanocrystals by pulsed laser ablation in aqueous media with the presence of surfactant and their self-assembly towards spindle-like ZnO aggregates**
C. He, T. Sasaki, Y. Shimizu, Y. Ishikawa, N. Koshizaki, Nanoarchitectonics Research Center (NARC), National Institute of Advanced Industrial Science and Technology (AIST), Japan

**#WeP-8 (051905-3) SHORT PRESENTATION Poster Board #8**
**Aggregation of silicon nanocrystals prepared by laser ablation in deinozed water**
V. Švrček, T. Sasaki, Y. Shimizu, N. Koshizaki, Nanoarchitectonics Research Center, AIST, Japan

**#WeP-9 (051912-1) Poster Board #9**
**Nanoparticle formation in the expansion process of a laser ablated plume**
T. Takiya, Hitachi Zosen Corporation, Japan; I. Umezu, Konan Univ., Japan; M. Yaga, Univ. of the Ryukyus, Japan; M. Han, Nanjing Univ., China

**#WeP-10 (12.16E) Poster Board #10**
**Study of cluster formation in short and ultra-short laser ablation**
T. E. Itina, J. Hermann, K. Gourriet, Laboratory of Lasers, Plasmas and Photonic Processing, Faculté des Sciences de Luminy, France; L. V. Zhigilei, Dept. of Materials Science & Engineering, Univ. of Virginia, USA; M. Sentis, Laboratory of Lasers, Plasmas and Photonic Processing, Faculté des Sciences de Luminy, France

**#WeP-11 (050716-2) Poster Board #11**
**Underwater excimer laser ablation of polymers as efficient source of nanosized particles suspensions**
S. Lazare, I. Elaboudi, C. Belin, J. L. Bruneel, L. Servant, Laboratoire de Physico-Chimie Moléculaire, Université de Bordeaux 1, France

## LPM Poster: Nanostructuring

**#WeP-12 (050822-1) SHORT PRESENTATION Poster Board #12**
**Generation of nanometer-sized silicon tadpoles irradiated with a high intensity laser pulse**
A. Sagisaka, Advanced Photon Research Center, Japan Atomic Energy Agency, Japan; H. Azuma, TOYOTA Central Research and Development Laboratories, Japan; H. Daido, Advanced Photon Research Center, Japan Atomic Energy Agency, Japan; N. Kamiya, T. Ito, A. Takeuchi, N. Suzuki, TOYOTA Central Research and Development Laboratories, Japan; A. Nishimura, K. Ogura, Advanced Photon Research Center, Japan Atomic Energy Agency, Japan; A. Fukumi, Advanced Photon Research Center, Japan Atomic Energy Agency, Japan, National Institute of Radiological Sciences, Japan; M. Mori, Y. Hayashi, S. Orimo, Y. Shimada, H. Murakami, Advanced Photon Research Center, Japan Atomic Energy Agency, Japan

**#WeP-13 (051578-1) Poster Board #13**
**Nanosize structures on subsurface of p-CdTe crystals formatted by pulse laser radiation**
A. Baidullaeva, O. I. Vlasenko, L. F. Cuzan, P.O. Mozol', Institute of Semiconductor Physics, National Academy of Sciences of Ukraine, Ukraine

**#WeP-14 (051902-1) Poster Board #14**
**Forming nanoporous GaN structure through photoelectrochemical process**
C-F. Lin, J-H. Zheng, Dept. of Materials Engineering, National Chung Hsing University, Taiwan

## LPM Poster: Micropatterning

**#WeP-15 (050897-1) Poster Board #15**
**Laser beam induced thermal pattering in critical polymer blends**
Y. Enomoto, M. Ohta, Nagoya Institute of Technology, Dept.of Environmental Technology, Japan

**#WeP-16 (051623-1) Poster Board #16**
**Micro-patterning of ITO and $SnO_2$ using high power Nd:YAG($\lambda$=1064nm) Laser**
D-Y. Kim, J-H. Kim, Company of LG Electronics, Republic of Korea

**#WeP-17 (051920-1) STUDENT SHORT PRESENTATION Poster Board #17**
**Laser marking of thin metallic thin film in a CD-ROM medium**
S. Katoh, S. Nakahara, S. Hisada, S. Shingubara, T. Fujita, Graduate School of Kansai Univ., Japan

## LPM Poster: Applications of Ultrafast Laser Processing

**#WeP-18 (051433-1) Poster Board #18**
**The processing of single crystal diamond by ultra short pulse laser**
K. Harano, K. Nakamae, N. Toda, Sumitomo Electric Industries, Japan; M. Hashida, S. Shimizu, S. Sakabe, Kyoto Univ., Japan

**#WeP-19 (051385-1) SHORT PRESENTATION Poster Board #19**
**Reflectivity change in nanoscale modification of DLC film with femtosecond laser pulses**
G. Miyaji, W. Kobayashi, K. Miyazaki, Institute of Advanced Energy, Kyoto Univ., Japan

**#WeP-20 (051249-1) Poster Board #20**
**Tribological properties of diamond-like carbon films with surface nano-structure formed by femtosecond laser pulses**
N. Yasumaru, Fukui National College of Technology, Japan; K. Miyazaki, Institute of Advanced Energy, Kyoto Univ., Japan; J. Kiuchi, Eyetec Co., Ltd., Japan; K. Komai, Fukui National College of Technology, Japan

**#WeP-21 (052771-2) Poster Board #21**
**Femtosecond laser microprocessing of separation membrane of metal**
X. Yang , G. Wang, N. Yang, Laser Processing Center, Tianjin Polytechnic Univ., China

**#WeP-22 (050762-3) Poster Board #22 CXLD 5/13**
**Femtosecond laser fabrication of tungsten microspike-arrays for micro-emitter**
T. Sano, E. Ohmura, Graduate School of Engineering, Osaka Univ., Japan; Y. Gotoh, Graduate School of Engineering, Kyoto Univ., Japan; Y. Hirata, A. Hirose, K. F. Kobayashi, Graduate School of Engineering, Osaka Univ., Japan

**#WeP-23 (051892-1) SHORT PRESENTATION Poster Board #23**
**Laser-induced photoluminescence change in Eu-doped sodium borate glass and its application in optical memory**
M-T. Trinh, K-S. Lim, S. Lee, J-R. Nam, Dept. of Physics, Chungbuk National Univ., Republic of Korea; E. Kim, Dept. of Chemical Engineering, Yonsei Univ., Republic of Korea; D. S. Hamilton, Dept. of Physics, Univ. of Connecticut, USA

**#WeP-24 (051861-1) Poster Board #24**
**Microfabrication of photomask with double-pulses femtosecond laser**
E. Dai, W. Pan, C. Zhou, Z. Han, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China

## LPM Poster: 3D microfabrication

**#WeP-25 (051517-1) Poster Board #25**
**Laser fabrication of ship-in-a-bottle microstructures in sapphire**
S. Matsuo, Y. Shichijo, T. Tomita, S. Hashimoto, The Univ. of Tokushima, Japan

**#WeP-26 (051536-1) STUDENT SHORT PRESENTATION Poster Board #26**
**Holographic femtosecond laser processing with multiplexed phase fresnel lenses**
S. Hasegawa, A. Takita, Y. Hayasaki, N. Nishida, Dept. of Optical Science and Technology, The Univ.of Tokushima, Japan

**#WeP-27 (051552-1) Poster Board #27**
**3D superresolution technology applied to femtosecond laser microfabrication**
W. Huang, Dept. of Precision Machinery and Precision Instrumentation, Univ. of Science and Technology of China; Y. Tan, S. Xiao, R. Guo, Dept. of Precision Machinery and Precision Instrumentation, Univ. of Science and Technology of China; A. Xia, State Key Laboratory of Molecular Reaction Dynamics, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China

## LPM Poster: SP L2 Laser-based Direct-write Techniques

**#WeP-28 (050424-1) SHORT PRESENTATION Poster Board #28**
**Microfabrication of silica glass by Laser-induced backside wet etching (LIBWE) with a DPSS UV laser**
H. Niino, Y. Kawaguchi, T. Sato, A. Narazaki, R. Kurosaki, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan

**#WeP-29 (051163-1) Poster Board #29**
**A fabrication of a copper grid mesh on the polyimide film by laser direct writing method**
H-S. Bae, S-H. Kim, Y-S. Hong, S-W. Moon, G-J. Nam, Institute for Advanced Engineering, Republic of Korea; N-H. Kwak, Jettech Ltd., Republic of Korea

**#WeP-30 (051287-1) STUDENT SHORT PRESENTATION Poster Board #30**
**Droplet ejection through laser-induced forward transfer for biomolecules microarrays printing**
M. Duocastella, M. Colina, J. M. Fernández-Pradas, P. Serra, J. L. Morenza, Universitat de Barcelona, Departament de Física Aplicada i Óptica, Spain

**#WeP-31 (050743-1) SHORT PRESENTATION Poster Board #31**
**The properties of repair wire written by solid state material transfer using infrared laser**
E. Kojima, T. Wada, OMRON Corporation, Japan

## LPM Poster: SP L3 Laser Micro/Nano-engineering for Biomedical Applications

**#WeP-32 (051365-1) STUDENT Poster Board #32**
**Biomaterial injection to single animal cell by focused femtosecond laser**
S. Iguchi, R.Yasukuni, Dept. of Applied Physics and Venture Business Laboratory, Osaka Univ., Japan; Y. Hosokawa, Dept. of Applied Physics and Venture Business Laboratory, Osaka Univ., Japan, CREST Program, Japan Science Technology Agency, Japan; Y. Hiraki, Institute for Frontier Medical Sciences, Kyoto Univ., Japan, CREST Program, Japan Science Technology Agency, Japan; H. Masuhara, Dept. of Applied Physics and Venture Business Laboratory, Osaka Univ., Japan, CREST Program, Japan Science Technology Agency, Japan

**#WeP-33 (051497-1) STUDENT Poster Board #33**
**Dissection of biological filaments by femtosecond laser irradiation**
R. Yasukuni, Dept. of Applied Physics, Osaka Univ., Japan; Y. Hosokawa, Dept. of Applied Physics, Osaka Univ., Japan, CREST Program, Japan Science Technology Agency, Japan; T. Asahi, Dept. of Applied Physics, Osaka Univ., Japan; Y. Hiraki, Institute for Frontier Medical Science, Kyoto Univ., Japan, CREST Program, Japan Science Technology Agency, Japan; H. Masuhara, Dept. of Applied Physics, Osaka Univ., Japan

**#WeP-34 (051885-1) Poster Board #34**
**Change in structures of amino acids as a result of femtosecond laser irradiation**
H. Nakano, N. Tamai, M. Nii, School of Science and Engineering, Kinki Univ., Japan; M. Tsukamoto, N. Abe, Joining and Welding Research Insitute (JWRI), Osaka Univ., Japan

**#WeP-35 (050716-4) Poster Board #35**
**RGD peptide grafting onto micro-patterned PET: Peptide distribution impact on cell attachment**
S. Lazare, Laboratoire de Physicochimie Moléculaire (LPCM), UMR 5803 du CNRS, Université de Bordeaux 1, France; C. Chollet, M. Remy-Zolghadri, R. Bareille, Biomatériaux et Réparation tissulaire, INSERM U577, France; C. Labrugère, Centre de caractérisation des Matériaux Avancés, ICMCB-CNRS, France; M. C. Durrieu, Biomatériaux et Réparation tissulaire, INSERM U577, France

**#WeP-36 (051556-1) SHORT PRESENTATION Poster Board #36**
**Electrophoresis microchip for DNA analysis fabricated in UV-transparent polymer by $F_2$ laser ablation**
K. Sugioka, K. Obata, K. Midorikawa, RIKEN-The Institute of Physical and Chemical Research, Japan

**#WeP-37 (051374-1) STUDENT Poster Board #37**
**Fabrication of micro fluidic devices for blood test by laser ablation and resin-film lamination**
J. Yamada, R. Tahara, Y. Yoshida, N. Terada, Dept. of Engineering, Toyo Univ., Japan; H. Yamada, Yamanashi Pref. Industrial Technology Center, Japan

**HPL Poster:**

**#WeP-40 (052771-3) Poster Board #40**
**Study about abradability of copper base's sprayed layer compoundly made by laser**
Y. Liu, Y. Wang, X. Zhang, X. Yang, Laser Processing Center, Tianjin Polytechnic Univ., China

**#WeP-41 (050682-1) Poster Board #41**
**Laser cladding of hydroxyapatite on stainless steel 316L for enhancing surface properties**
C. T. Kwok, Dept. of Electromechanical Engineering, Univ. of Macau, Macau; F. T. Cheng, Dept. of Applied Physics, Univ. of Macau, Macau; H.C. Man, Dept. of Industrial & Systems Engineering, The Hong Kong Polytechnic Univ., China; I. P.K. Wong, Dept. of Electromechanical Engineering, Univ. of Macau, Macau

**#WeP-42 (052771-4) Poster Board #42**
**Compute simulation of the concentration fields of powder flow in laser manufacturing**
X. Yang, X. Jin, L. Feng, Y. Wang, Laser Processing Center, Tianjin Polytechnic Univ., China

**#WeP-43 (050726-1) STUDENT Poster Board #43**
**Characteristics of laser aided direct metal powder deposition process for nickel-based superalloy**
K. Zhang, Shenyang Institute of Automation, Chinese Academy of Sciences, China, Graduate School of the Chinese Academy of Sciences, China; W. Liu, Shenyang Institute of Automation, Chinese Academy of Sciences, China; X. Shang, Shenyang Institute of Automation, Chinese Academy of Sciences, China, Shenyang Institute of Aeronautical Engineering, China

**#WeP-44 (052771-1) Poster Board #44**
**Testing of velocity field of powder fluid in laser manufacturing**
X. Yang, N. Yang, Laser Processing Center, Tianjin Polytechnic Univ., China

# DAY-3: MAY 18, THURSDAY

**Events: 4 parallels and Banquet**

## JS-02 SPECIAL SESSION SP J1-1
**Recent Advances in Fiber and Disk Lasers and Their Novel Applications to Materials Processing**
**– Potential of High-Power Fiber and Disk Lasers –**
**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(9:00-10:30, 90min.)**

| TIME | Chair: F. Dausinger, Univ. of Stuttgart, Institute für Strahlwerkzeuge, IFSW, Germany |
|---|---|
| 9:00 | **#Th1-1 (4.12E) INVITED**<br>**The Potential of fibre lasers**<br>D. N. Payne, Optoelectronics Research Centre, Univ. of Southampton, SPI Lasers plc, UK |
| 9:30 | **#Th1-2 (4.07E) INVITED**<br>**Potential of the thin disk laser**<br>A. Giesen, Insitut für Strahlwerkzeuge, Universität Stuttgart, Germany |
| 10:00 | **#Th1-3 (050936-1) INVITED**<br>**High power disk lasers and their applications**<br>K. Mann, TRUMPF Laser GmbH + Co. KG., Germany |
| | **None** |

## LPM-13 Ultrafast Laser Processing
**– Micromachining –**
**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(9:00-10:20, 80min.)**

| TIME | Chair: W. Watanabe, AIST, Japan |
|---|---|
| 9:00 | **#Th2-1 (051039-1)**<br>**Application of picosecond laser micro-machining for diffraction grating**<br>J. Noh, H. Sohn, J. Suh, J-H. Lee, KIMM-Korea Institution of Machinery & Material, Republic of Korea |
| 9:20 | **#Th2-2 (051451-1)**<br>**Selective patterning of thin metal electrode of multi-layered OLED by ultra-short laser pulses**<br>Y. Ito, T. Adachi, Dept. of Mechanical Engineering, Nagaoka Univ. of Technology, Japan; E. Matsumoto, H. Kamada, R&D Center, Tokki Co., Japan |
| 9:40 | **#Th2-3 (051219-1)**<br>**Structuring of ITO layer on glass with high repetition rate picosecond lasers**<br>G. Račiukaitis, M. Brikas, M. Gedvilas, G. Darčianovas, Laboratory for Applied Research, Institute of Physics, Lithuania |
| 10:00 | **#Th2-4 (051334-1)**<br>**Micro-machining of dielectric media using femtosecond laser pulses**<br>P. Lu, N. Dai, Y. Li, B. Yu, H. Long, Huazhong Univ. of Science and Technology, China |

**COFFEE BREAK**

## JS-02 SPECIAL SESSION SP J1-2
**Recent Advances in Fiber and Disk Lasers and Their Novel Applications to Materials Processing**
**–High-Power Applications of Fiber and Disk Lasers–**
**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(10:40-12:40, 120min.)**

| TIME | Chair: P. Hilton, TWI Ltd., UK |
|---|---|
| 10:40 | **#Th1-4 (051688-4) INVITED**<br>**Fiber laser welding - Basic investigations and application studies**<br>F. Vollertsen, BIAS-Bremer Institut für angewandte Strahltechnik GmbH, Germany |
| 11:10 | **#Th1-5 (053011-1) INVITED**<br>**Use of fiber lasers with highest beam quality for welding of steel and light weight alloys**<br>B. Brenner, G. Göbel, D. Dittrich, R. Schedewy, J. Standfuss, E. Beyer, Fraunhofer Institute Material and Beam Technology, Germany |
| 11:40 | **#Th1-6 (051048-1)**<br>**Laser welding with thin disk lasers up to 6kW**<br>F. Dausinger, Institut für Strahlwerkzeuge (IFSW), Germany; J. Weberpals, Forschungsgesellschaft für Strahlwerkzeuge (FGSW), Germany; C. Deininger, Institut für Strahlwerkzeuge (IFSW), Germany |
| 12:00 | **#Th1-7 (052318-1) STUDENT**<br>**Phenomena during high power fiber laser welding**<br>K. Kinoshita, Y. Kawahito, M. Mizutani, S. Katayama, Joining and Welding Research Insitute, Osaka Univ., Japan |
| 12:20 | **#Th1-8 (4.04E)**<br>**Development of outer surface laser irradiated stress improvement process (L-SIP)**<br>T. Ota, T. Ishide, K. Kamo, S. Tsubota, H. Onitsuka, N. Sugimoto, K. Okimura, Mitsubishi Heavy Industries, Ltd., Japan |

## LPM-14 Ultrafast Laser Processing
**– Glass Processing –**
**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(10:40-12:10, 90min.)**

| TIME | Chair: J. Solis, Insituto de Optica, CSIC, Spain |
|---|---|
| 10:40 | **#Th2-5 (050799-1) INVITED**<br>**Structuring of nanocomposite glass using femtosecond lasers**<br>H. Graener, Dept. of Physics, Martin-Luther-Universität Halle-Wittenberg, Germany |
| 11:10 | **#Th2-6 (051425-1) STUDENT**<br>**Micro-modification of metal doped glasses by a femtosecond laser**<br>B. Hua, K. Hirao, Dept. of Material Chemistry, Kyoto Univ., Japan |
| 11:30 | **#Th2-7 (051427-1)**<br>**Periodic nanovoid structure inside transparent material using fs laser irradiation**<br>S. Kanehira, Kyoto Univ., Japan; J. Si, JST, Japan; K. Miura, K. Fujita, K. Hirao, Kyoto Univ., Japan |
| 11:50 | **#Th2-8 (051531-1) STUDENT**<br>**Fabricating gratings by use of femtosecond fiber laser in fused silica**<br>T. Tamaki, W. Watanabe, Osaka Univ., Japan; H. Nagai, M. Yoshida, AISIN SEIKI Co., Ltd., Japan; J. Nishii, National Institute of Advanced Industrial Science and Technology , Japan; K. Itoh, Osaka Univ., Japan |
| | **None** |

**LUNCH TIME**

| **LPM-18 Fundamentals & Process Monitoring**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(9:00-10:20, 80min.)** | | **HPL-10 Surface Treatment 1**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(9:00-10:20, 80min.)** | |
|---|---|---|---|
| **TIME** | **Chair: T. Okada, Kyushu Univ., Japan** | **TIME** | **Chair: J. Gottman, Lehrstuhl für Lasertechnik, RWTH-Aachen, Germany** |
| **9:00** | **#Th3-1 (051614-1)**<br>**Solidification and epitaxial re-growth in laser-assisted surface nanostructuring**<br>X. Wang, Dept. of Mechanical Engineering, The Univ. of Nebraska–Lincoln, USA; Y. Lu, Electrical Engineering, The Univ. of Nebraska–Lincoln, USA | **9:00** | **#Th4-1 (051142-1)**<br>**Influence of overlapping passes on microstructure of hot-work tool steels treated by continuous $CO_2$ laser**<br>R. Horiuchi, Tokai Univ. Japan; T. Dikova, Technical Univ. of Varna, Bulgaria; S. Yamaguchi, S. Seto, Tokai Univ. Japan |
| **9:20** | **#Th3-2 (051579-1)**<br>**Laser-induced processes at the solid-liquid Interface**<br>W. Kautek, Dept. of Physical Chemsitry, Univ. of Vienna, Austria | **9:20** | **#Th4-2 (051763-2)**<br>**Investigation into characteristics of laser surface hardening for S45C medium carbon steel using Nd:YAG laser with a continuous wave**<br>H. J. Shin, Y. T. Yoo, Dept. of Mechatronics Eng., Chosun Univ., Republic of Korea; D. G. Ahn, Dept. of Mechanical Eng., Chosun Univ., Republic of Korea; K. Im, Dept. of Physics, Chonnam Univ, Republic of Korea |
| **9:40** | **#Th3-3 (051190-1)**<br>**Distributions of B and BN densities in laser-ablation BN plasmas studied by laser-induced fluorescence imaging spectroscopy**<br>S. Yasuda, N. Takada, K. Sasaki, Dept.of Electrical Engineering and Computer Science, Nagoya Univ., Japan | **9:40** | **#Th4-3 (051494-1)**<br>**Integrated heat treatment - System for precise die hardening in automotive industries**<br>S. Bonss, J. Hannweber, M. Seifert, U. Karsunke, E. Beyer, Fraunhofer IWS Dresden, Germany |
| **10:00** | **#Th3-4 (051512-2)**<br>**Induced current in laser plasma and its application for monitoring laser microprocessing**<br>N. Idris, Dept. of Physics, Faculty of Mathematics and Natural Sciences, Syiah Kuala Univ., Indonesia, Dept. of Physics, Faculty of Education and Regional Studies, Univ. of Fukui, Japan; K. Kataoka, K. Kagawa, Dept. of Physics, Faculty of Education and Regional Studies, Univ. of Fukui, Japan | **10:00** | **#Th4-4 (051159-1) STUDENT**<br>**Surface treatment of the titanium-base alloy by laser**<br>R. Horiuchi, S. Seto, Dept.of Material Science, School of Engineering, Tokai Univ., Japan; S. Yamaguchi, Dept. of Physics, School of Science, Tokai Univ., Japan; T. Dikova, High-Technology Park, Technical Univ. of Varna, Bulgaria |
| **COFFEE BREAK** | | | |
| **LPM-19 Organic Materials Microprocessing**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(10:40-12:10, 90min.)** | | **HPL-11 Surface Treatment 2**<br>**- Laser Sintering and Surface Treatment -**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(10:40-11:40, 60min.)** | |
| **TIME** | **Chair: S. Pissadakis, FORTH, IESL, Greece** | **TIME** | **Chair: S. Yamaguchi, Tokai Univ., Japan** |
| **10:40** | **#Th3-5 (050832-1) INVITED**<br>**UV-laser forming of organic nanoaggregates and polymeric films**<br>H.-G. Rubahn, Fysisk Institut, Syddansk Universitet, Denmark | **10:40** | **#Th4-5 (051330-1)**<br>**Analysis of laser sintering process and example of direct manufacturing application**<br>P. Aubry, N. Coulon, GERAILP, France |
| **11:10** | **#Th3-6 (051371-1) STUDENT**<br>**Micro-patterning of individual polyhedra using femtosecond laser ablation of water**<br>T. Kaji, Graduate School of Frontier Biosciences, Dept. of Appl. Phys., Venture Business Lab., Osaka Univ., JST-CREST, Japan; Y. Hosokawa, Dept. of Appl. Phys., Venture Business Lab., Osaka Univ., JST-CREST, Japan; H. Mori, Faculty of Textile Science, Kyoto Institute of Technology, JST-CREST, Japan; H. Masuhara, Graduate School of Frontier Biosciences, Dept. of Appl. Phys., Venture Business Lab., Osaka Univ., JST-CREST, Japan | **11:00** | **#Th4-6 (052264-1)**<br>**Investigation on the improving physical properties of functional ceramics by laser sintering**<br>L. Ji, Y. Jiang National Center of Laser Technology, Beijing Univ. of Technology, China |
| **11:30** | **#Th3-7 (050716-1)**<br>**Single laser pulse induced cavitation, bubbling and foaming on biopolymer films**<br>S.Lazare, Université de Bordeaux 1, France ; A. Sionkowska, M. Wisniewski, Nicolaus Copernicus Univ., Faculty of Chemistry, Poland; V.Tokarev, Natural Science Center, General Physics Institute, Russia; M. Castillejo, Institute of Physical Chemistry Rocasolano, CSIC, Spain | **11:20** | **#Th4-7 (051836-1)**<br>**Fabrication of TI6AL4V/IN718 functional graded material by laser consolidation**<br>X. Huang, Y. Liu, Y. Li, H. Peng, GE (China) Research & Development Center Co. Ltd., China; M. Azer, GE Global Research Center, USA |
| **11:50** | **#Th3-8 (051514-1)**<br>**Debris-free process for excimer laser ablation of polymers**<br>D-S. Shin, J-H. Lee, J. Suh, IT Machinery Research Ctr., Korea Institute of Machinery & Materials, Republic of Korea | | None |
| **LUNCH TIME** | | | |

| **JS-02 SPECIAL SESSION SP J1-3**<br>**Recent Advances in Fiber and Disk Lasers and Their Novel Applications to Materials Processing –Microfabrication by Fiber and Disk Lasers–**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(13:30-15:00, 90min.)** | | **LPM-15**<br>**Manufacture of Microdevices & Components**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(13:30-15:00, 90min.)** | |
|---|---|---|---|
| **TIME** | **Chair: I. Miyamoto, Osaka Univ., Japan** | **TIME** | **Chair: H. Helvajian, The Aerospace Corporation, USA** |
| **13:30** | **#Th1-9 (052866-1) INVITED**<br>**High power, high repetition rate green q-switched lasers for annealing applications**<br>H.- J. Kahlert, JENOPTIK Laser Optik Systeme GmbH, Germany | **13:30** | **#Th2-9 (050873-1) INVITED**<br>**Metal and polymer microparts generated by laser rapid prototyping**<br>A. Ostendorf, A. Neumeister, S. Czerner, Laser Zentrum Hannover e.V., Germany |
| **14:00** | **#Th1-10 (051636-2)**<br>**Micro machining with a single mode 100W fiber laser**<br>M. Naeem, S. Lewis, Laser Div., GSI Group, UK | **14:00** | **#Th2-10 (051550-2)**<br>**Microstereolithography for the production of microfluidic devices**<br>S. Maruo, T. Kudo, Dept. of Mechanical Engineering, Graduate School of Engineering, Yokohama National Univ., Japan |
| **14:20** | **#Th1-11 (051908-1)**<br>**A high power femtosecond fiber chirped pulse amplification system for high speed micromachining**<br>L. Shah, M. E. Fermann, IMRA America, Inc., USA | **14:20** | **#Th2-11 (051644-1)**<br>**Laser processing of low temperature inkjet printed micro electric components of functional nano-ink for flexible electronics**<br>S. H. Ko, H. Pan, Laser Thermal Lab., Dept. of Mechanical Eng., Univ. of California, Berkeley; USA; J. Chung, Dept. of Mechanical Eng., Korea Univ., Seoul, Republic of Korea; C. P. Grigoropoulos, Laser Thermal Lab., Dept. of Mechanical Eng., Univ. of California, Berkeley; USA; D. Poulikakos, Lab. of Thermodynamics in Emerging Technologies, Dep. of Mechanical and Process Eng., ETH Zurich, Switzerland |
| **14:40** | **#Th1-12 (051911-1)**<br>**High efficiency micro-processing with pulsed and continuous wave fiber lasers**<br>T. Hoult, SPI Lasers LLC, UK | **14:40** | **#Th2-12 (052054-2)**<br>**Array of periodic submicron resistors in silicon fabricated by laser-induced periodic melting**<br>M. Meunier, Y. Liao, J.-Y. Degorce, Laser Processing Laboratory, Dept. of Engineering Physics, École Polytechnique de Montréal, Canada |
| **COFFEE BREAK** | | | |
| **HPL-08 Latest Novel Processing**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(15:20-16:50, 90mins.)** | | **LPM-16 3D Micro & Nanofabrication**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(15:40-16:40, 60min.)** | |
| **TIME** | **Chair: S. Katayama, Osaka Univ., Japan** | **TIME** | **Chair: Y. Nakata, Osaka Univ., Japan** |
| **15:20** | **#Th1-13 (052695-1) INVITED**<br>**High power fiber lasers and their potential impact on manufacturing**<br>P. Denney, The Edison Welding Institute (EWI), USA | **15:40** | **#Th2-13 (051711-2)**<br>**Laser-assisted fabrication of 3-D photonic crystals**<br>Y. F. Lu, H. Wang, Z. Y. Yang, Dept. of Electrical Engineering, Univ. of Nebraska-Lincoln, USA |
| **15:50** | **#Th1-14 (051897-2) INVITED**<br>**R & D activities and specific industrial applications of laser processing in Finland**<br>V. Kujanpää, Lappeenranta Univ. of Technology, Laser Processing Laboratory, Finland | **16:00** | **#Th2-15 (051172-1)**<br>**Three-dimensional nanostructuring of transparent materials by the femtosecond laser irradiation**<br>Y. Shimotsuma, M. Sakakura, S. Kanehira, Dept. of Material Chemistry, Kyoto Univ., Japan; J. Qiu, Dept. of Materials Science and Engineering, Zhejiang Univ., China; P. G. Kazansky, Optoelectronics Research Center, Univ. of Southampton, UK; K. Miura, K. Fujita, K. Hirao, Dept. of Material Chemistry, Kyoto Univ., Japan |
| **16:20** | **#Th1-15 (3.03E) INVITED**<br>**Enhancing laser system flexibility with the combi-head for cutting and joining**<br>R. Poprawe, D. Petring, F. Schneider, C. Benter, Fraunhofer-Institute for Laser Technology (ILT), Germany | **16:20** | **#Th2-16 (050716-3)**<br>**High performance laser microdrilling and new insights into the mechanisms by means of video recording**<br>S. Lazare, Laboratoire de Physico-Chimie Moléculaire, Université de Bordeaux1, France |
| **COFFEE BREAK** | | | |

| **LPM-20 Laser & Photochemistry**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(13:30-15:00, 90min.)** | | **HPL-12 Surface Treatment 3**<br>**- Laser Cladding and Prototyping -**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(13:30-15:00, 90min.)** | |
|---|---|---|---|
| **TIME** | **Chair: S. Lazare, Univ. Bordeaux 1, France** | **TIME** | **Chair: K. Uenishi, Osaka Univ., Japan** |
| **13:30** | **#Th3-9 (050817-1) INVITED**<br>**Deep UV radiation induced photodissociative processes in transparent optical materials: index engineering and structural modification effects**<br>S. Pissadakis, M. Konstantaki, C. Pappas, G. Violakis, Institute of Electronic Structure and Laser, Foundation for Research and Technology-Hellas, Heraklion, Greece | **13:30** | **#Th4-8 (1.05E) INVITED**<br>**Laser metal deposition – A powerful tool for turbo machinery**<br>J. Gottman, E. W. Kreutz, Fraunhofer-Institut für Lasertechnik, Steinbachstraße Aachen, Germany |
| **14:00** | **#Th3-10 (051080-1)**<br>**Photochemical welding of silica microspheres to silicone rubber by $F_2$ laser**<br>M. Okoshi, J. Cho, N. Inoue, National Defense Academy, Japan; J. Li, P. R. Herman, Univ. of Toronto, Canada | **14:00** | **#Th4-9 (051330-2)**<br>**Results on process engineering and control of single crystal blades laser repairing**<br>P. Aubry, T. Malot, GERAILP, France |
| **14:20** | **#Th3-11 (050945-2)**<br>**fs-laser-induced fabrication of polymeric integrated-optical microstructures**<br>S. Metev, C. Wochnowski, BIAS-Bremer Institut für angewandte Strahltechnik, Germany; Y. Cheng, K. Sugioka, Laser Technology Laboratory, The Institute of Physical and Chemical Research (RIKEN), Japan; F. Vollertsen, BIAS–Bremer Institut für angewandte Strahltechnik,Germany; K. Midorikawa, Laser Technology Laboratory, The Institute of Physical and Chemical Research (RIKEN), Japan | **14:20** | **#Th4-10 (051099-1) CXLD 5/12**<br>**Mo-Si-B multiple phases coating produced by laser cladding**<br>S. Yang, Dept. of Materials Science and Engineering, Inner Mongolia Univ. of Technology, China; T. Gong, Dept. of Mechanical Engineering, Tsinghua Univ., China; X. Yang, Dept.of Materials Science and Engineering, Inner Mongolia Univ. of Technology, China; M. Zhong, W. Liu, Dept.of Mechanical Engineering, Tsinghua Univ., China |
| **14:40** | **#Th3-12 (051040-1)**<br>**Laser-induced formation of a photocatalytic $TiO_2$ micronetwork on a UV-absorbing $SiO_2$-based glass surface**<br>A. Narazaki, Y. Kawaguchi, H. Niino, Photonics Research Institute, National Institute of Advanced Industrial Science and Technology (AIST), Japan; M. Shojiya, H. Koyo, K. Tsunetomo, Technical Research Lab., Kansai Research Center, Nippon Sheet Glass Co., Ltd., Japan | **14:40** | **#Th4-11 (050725-1)**<br>**Laser direct powder deposition of Ti-6.5Al-2Zr-1Mo-1V titanium alloy part**<br>M. Xi, L. Shi, B. Du, L. Cai, Y. Zhang, National Engineering and Technological Research Center for Non-ferrous Metals Composites, General Research institute for Non-ferrous Metals, China |
| **COFFEE BREAK** | | | |
| **LPM-21 Liquid-Assisted Ablation**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(15:20-16:40, 80min.)** | | **HPL-13 Surface Treatment 4**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(15:20-16:40, 80min.)** | |
| **TIME** | **Chair: M. H. Hong, Data Storage Institute, Singapore** | **TIME** | **Chair: B. R. Brenner, Fraunhofer Institute Material and Beam Technology** |
| **15:20** | **#Th3-13 (051064-1)**<br>**Fabrication of deep microtrenches on silica glass surface by LIBWE method**<br>Y. Kawaguchi, T. Sato, A. Narazaki, R. Kurosaki, H. Niino, National Institute of Advanced Industrial Science and Technology (AIST), Japan | **15:20** | **#Th4-12 (051872-1) STUDENT**<br>**Effects of process parameters on crack behavior during laser cladding of Fe-based alloy on aluminum**<br>Y. Yoo, N. Kang, C. Lee, J. Kim, M. Kim, Korea Institute of Industrial Technology (KITECH), Adanced Welding & Joining Technology Team, Republic of Korea |
| **15:40** | **#Th3-14 (051571-1)**<br>**Enhancing the etch rate at backside etching of fused silica**<br>K. Zimmer, R. Böhme, B. Rauschenbach, Leibniz-Institute for Surface Modification, Germany | **15:40** | **#Th4-13 (052398-1)**<br>**Influence of laser radiation on properties of $SiO_2$/Si**<br>A. Medvid', P. Onufrijevs, Riga Technical Univ., Latvia; D. Kropman, E. Mellikov, Tallin Univ.of Technology, Estonia; F. Muktepavela, G. Bakradze, Institute of Solid State Physics, Univ. of Latvia, Latvia |
| **16:00** | **#Th3-15 (051571-2)**<br>**Backside etching at the interface to dilute medium with nanometer etch rates**<br>K. Zimmer, R. Böhme, B. Rauschenbach, Leibniz-Institute for Surface Modification, Germany | **16:00** | **#Th4-14 (051533-1)**<br>**Practical applications of camera systems for laser heat treatment**<br>J. Hannweber, S. Bonss, B. Brenner, E. Beyer, Fraunhofer IWS Dresden, Germany |
| **16:20** | **#Th3-16 (051437-1)**<br>**Liquid-assisted excimer laser micromachining for ablation enhancement and debris reduction**<br>D. Kim, D. Jang, Dept.of Mechanical Engineering, POSTECH, Republic of Korea | **16:20** | **#Th4-15 (052580-1)**<br>**Effect of the simultaneous application of mechanical action and laser radiation on advanced high strength steel: development of low spring-back laser assisted mechanical forming**<br>P.M. Romero, G. J. Rodríguez, J. L. Arias, J. Vázquez. AIMEN, Laser Application Centre, Spain |
| **COFFEE BREAK** | | | |

| **HPL-09 Laser System**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(17:00-18:20, 80min.)** | | **LPM-17 3D Micro & Nanolithography**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(17:00-18:20, 80min.)** | |
|---|---|---|---|
| **TIME** | **Chair: N. Abe, Osaka Univ., Japan** | **TIME** | **Chair: S. Maruo, Yokohama National Univ., Japan** |
| **17:00** | **#Th1-16 (051909-1)**<br>**SIRILAS - the new standard of laser diode for high volume applications**<br>G. Okada, Spectronix Corporation, Japan; A. Schmitt, M. Behringer, H. König, Osram Opto Semiconductors GmbH, Germany | **17:00** | **#Th2-17 (051576-1)**<br>**Nanofabrication with laser holographic lithography for nanophotonic structures**<br>J-S. Yeo, H. Lewis, N. Meyer, Hewlett-Packard Company, USA |
| **17:20** | **#Th1-17 (051446-2)**<br>**High power laser system with high repetition rate using phase locked stimulated Brillouin scattering phase conjugation mirrors**<br>H. J. Kong, J. W. Yoon, J. S. Shin, D. H. Beak, Dept. of Physics, Korea Advanced Institute of Science and Technology, Republic of Korea; S. K. Lee, Advanced Photonics Research Institute, Gwang Ju Institute of Science and Technology, Republic of Korea; M. Nakatsuka, Institute of Laser Engineering, Osaka Univ., Japan | **17:20** | **#Th2-18 (051516-1) STUDENT**<br>**LCD micro stereolithography of conductive micro shapes using silver particles photosensitive resin**<br>D. K. Lee, T. Miyoshi, Y. Takaya, T. Hayashi, Dept. of Mechanical Engineering and Systems, Osaka Univ., Japan; Y. Yagi, D. Sakurai, Matsushita Electric Industrial Co., Ltd., Japan |
| **17:40** | **#Th1-18 (051186-1)**<br>**Modeling of quantum well laser with temperature dependent parameters**<br>T. C. Leong, P. Yava, School of Engineering and Information Technology, Univ. Malaysia Sabah, Malaysia | **17:40** | **#Th2-19 (051139-1) STUDENT**<br>**Three-dimensional lithography using a self-trapped filament of femtosecond laser pulses**<br>M. Mizoshiri, H. Nishiyama, Y. Hirata, Dept. of Materials and Manufacturing Science, Graduate School of Engineering, Osaka Univ., Japan; J. Nishii, National Institute of Advanced Industrial and Science Technology (AIST), Japan; T. Kawahara, T. Kawai, The Institute of Scientific and Industrial Research, Osaka Univ., Japan |
| **18:00** | **#Th1-19 (3.29E)**<br>**Advanced technology of high power laser diode and the system**<br>X. Huang, K. Tai, V. Rossin, E. Zucker, A. Leuzinger, T. Strite, JDSUniphase Corporation, USA | **18:00** | **#Th2-20 (051446-1)**<br>**Parametric estimations of micro/nano structures by two-photon absorbed photopolymerization**<br>H. J. Kong, S. W. Yi, M. Cho, Dept. of Physics, KAIST, Republic of Korea; T-W. Lim, D-Y. Yang, Dept. of Mechanical Engineering, KAIST, Republic of Korea; S. Kim, Dept. of Chemistry, KAIST, Republic of Korea |
| **18:30** | **Banquet (Atrium, East District, 1F) (18:30-21:00)** | | |

| **LPM-22**<br>**Manufacture of Photonic Devices**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(17:00-18:20, 80min.)** | | **HPL-14**<br>**Innovations**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(17:00-18:00, 60min.)** | |
|---|---|---|---|
| **TIME** | **Chair: W. Watanabe, AIST, Japan** | **TIME** | **Chair: R. Fabbro, LALP (CNRS)/GIP GERAILP, France** |
| **17:00** | **#Th3-17 (051481-1)**<br>**Fabrication of $SiO_2$ phase gratings by UV laser patterning of silicon suboxide layers and subsequent oxidation**<br>J.-H. Klein-Wiele, J. Bekesi, P. Simon, J. Ihlemann, Laser-Laboratorium Göttingen, Germany | **17:00** | **#Th4-16 (050687-1)**<br>**Laser peening without coating as a surface enhancement technology**<br>Y. Sano, Toshiba Corporation, Japan; K. Akita, Musashi Institute of Technology, Japan; K. Masaki, Y. Ochi, Univ. of Electro-Communications, Tokyo, Japan; I. Altenberger, B. Scholtes, Univ. of Kassel, Germany |
| **17:20** | **#Th3-18 (051462-1)**<br>**Fabrication of optical waveguides for optical PCB using laser direct writing method**<br>S-H. Cho, B-H. Yoo, W-S. Chang, J-G. Kim, K-H. Whang, Nano Machining Lab., Korea Institute of Machinery & Materials (KIMM), Republic of Korea | **17:20** | **#Th4-17 (050870-1)**<br>**Laser ablation simulation including time dependent atomic processes**<br>H. Furukawa, Institute for Laser Technology, Osaka Univ., Japan |
| **17:40** | **#Th3-19 (051930-1)**<br>**Volume waveguides by refractive index modification in fused silica using fs-laser double pulses**<br>D. Wortmann, M. Ramme, J. Gottmann, Lehrstuhl für Lasertechnik, RWTH Aachen, Germany | **17:40** | **#Th4-18 (051569-1)**<br>**LASer Adhesion Test (LASAT) applied to a thermal sprayed ceramic coating : a global approach of the technique**<br>L. Berthe, M. Nivard, Laboratoire pour l'Application des Lasers de Puissance (LALP, UPR CNRS n°1578), France ; V. Guipont, Ecole Des Mines De Paris/C2P-Center for Plasma Processing, France |
| **18:00** | **#Th3-20 (051276-1)**<br>**Astigmatic beam shaping as a tool for producing deep subsurface waveguides by direct laser writing with reduced spherical aberration**<br>J. Solis, J. Siegel, V. Diez-Blanco, Instituto de Optica, CSIC, Spain; F. Vega, J. Armengol, Dept. d´Optica i Optometría, UPC, Spain | | None |
| **18:30** | **Banquet** **(Atrium, East District, 1F) (18:30-21:00)** | | |

# DAY-4: MAY 19, FRIDAY

**Events: 4 parallels and Joint Session**

## LPM SPECIAL SESSION SP L3-1
## Laser Processing for Biomedical Applications 1

**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(9:00-10:30, 90min.)**

| TIME | Chair: M. Meunier, Ecole Polytechnique de Montreal |
|---|---|
| 9:00 | **#Fr1-1 (050705-1) INVITED**<br>**Femtosecond laser nanosurgery of biological cells and tissues**<br>A. Vogel, J. Noack, G. Hüttmann, Biomedizinische Optik, Universität zu Lübeck, Germany; G. Paltauf, Experimentalphysik, Karl-Franzens-Universität, Austria |
| 9:30 | #**Fr1-2 (052342-1)**<br>**Adavanced laser fabrication: Enabling new 3D micro-photonics tools for LAB-ON-A-CHIP**<br>P. R. Herman, L. Abolghasemi, D. Chanda, Dept. of Electrical and Computer Engineering, Univ. of Toronto, Canada; L. Charron, Biomedical Physics, Univ. of Toronto, Canada; J. Dou, S. Eaton, S. Ho, J. Li, Dept. of Electrical and Computer Engineering, Univ. of Toronto, Canada; L. Lilge, Biomedical Physics, Univ. of Toronto, Canada; M. Xu, Dept. of Electrical and Computer Engineering, Univ. of Toronto, Canada |
| 9:50 | **#Fr1-3 (050739-2)**<br>**Performing PCR with the integration of a radial gradient heater chip and a circular microfluidic chip**<br>J-Y. Cheng, Y-C. Chuang, J-R. Hsieh, Research Center for Applied Sciences, Academia Sinica, Taiwan |
| 10:10 | **#Fr1-4 (051125-1)**<br>**Tip processing of quartz optical fiber for dental treatment with $TiO_2$ powder – Irradiation characteristics of $TiO_2$-processed (TP) fiber –**<br>T. Furumoto, T. Ueda, A. Hosokawa, R. Tanaka, T. Arashi, Kanazawa Univ., Japan; N. Sugihara, Sugahara Dental Clinic, Japan; M. Waga, Asahikawa Dental Clinic, Japan; A. Konno, Altech Co., Ltd., Japan |

## LPM-23
## Microprocessing for Semiconductor Industry

**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(9:00-10:30, 90min.)**

| TIME | Chair: K. Washio, Paradigm Laser Research, Japan |
|---|---|
| 9:00 | INVITED TALK, "Advanced laser machining technology and systems for semiconductor manufacturing" (A. Bolye, Xsil Ltd., Ireland) has been cancelled as of 5/12.<br><br>To be announced. |
| 9:30 | **#Fr2-2 (051841-1)**<br>**The mechanism of semiconductor wafer dicing by stealth dicing technology**<br>M. Kumagai, K. Fukumitsu, Hamamatsu Photonics K. K., Japan; E. Ohmura, Dep. of Manufacturing Science Osaka Univ., Japan; H. Morita, K. Atsumi, N. Uchiyama, Hamamatsu Photonics K. K., Japan |
| 9:50 | **#Fr2-3 (051469-1) STUDENT**<br>**Thermal elastic-plastic analysis on internal processing phenomena of single-crystal silicon by nanosecond laser**<br>T. Monodane, E . Ohmura, Dept. of Materials and Manufacturing Science, Osaka Univ., Japan; F. Fukuyo, K. Fukumitsu, H. Morita, Hamamatsu Photonics K.K., Japan; Y. Hirata, Dept. of Materials and Manufacturing Science, Osaka Univ., Japan |
| 10:10 | **#Fr2-4 (051570-1)**<br>**Gentle dicing of thin semiconductor materials by water-jet-guided laser**<br>Y. Kozuki, D. Perrottet, B.Richerzhagen, Synova SA, Switzerland |

**COFFEE BREAK**

## LPM SPECIAL SESSION SP L3-2
## Laser Processing for Biomedical Applications 2

**(Room 1 (Science Hall), East District #1 Bldg., 4F)**
**(10:50-12:20, 90min.)**

| TIME | Chair: P. R. Herman, Univ. of Toronto, Canada |
|---|---|
| 10:50 | **#Fr1-5 (052637-1) INVITED**<br>**Targeted gene transfection by the uses of laser-induced stress wave**<br>S. Sato, National Defense Medical College Research Institute, Div. of Biomedical Information Sciences, Japan; M. Terakawa, M. Obara, Dept. of Electronics and Electrical Engineering, Keio Univ., Japan |
| 11:20 | **#Fr1-6 (051239-1)**<br>**Fabrication of a novel microfluidic device incorporating 2-D array of microbeads by using LIBWE microstructures**<br>T. Sato, T. Gumpenberger, R. Kurosaki, A. Narazaki, Y. Kawaguchi, H. Niino, National Institute of Advanced Industrial Science and Technology (AIST), Japan |
| 11:40 | **#Fr1-7 (051873-1)**<br>**Microchannel fabricated by femtosecond laser micromachining in glass for observation of living cells**<br>Y. Hanada, K. Sugioka, H. Kawano, I. Ishikawa, A. Miyawaki, RIKEN-The Institute of Physical and Chemical Research, Japan; Z.Morita, H. Takai, Tokyo Denki Univ., Japan; K. Midorikawa, RIKEN, Japan |
| 12:00 | **#Fr1-8 (051856-1)**<br>**Femtosecond laser micromachining of 3-D micro-optical lenses for biophotonic applications**<br>H-L.Tsai, Y. Cheng, Univ.of Missouri-Rolla, Dept.of Mechanical & Aerospace Engineering, USA; K. Sugioka, K. Midorikawa, RIKEN-The Institute of Physical and Chemical Research, Japan |

## LPM-24
## Microprocessing for Electronics Industry I

**(Room 2 (AV Room), East District #1 Bldg., 4F)**
**(10:50-12:20, 90min.)**

| TIME | Chair: To be announced |
|---|---|
| 10:50 | **#Fr2-5 (050869-1) INVITED**<br>**Laser-assisted micro components assembly: releasing control and placement accuracy improvement investigation**<br>N. S. Karlitskaya, Univ. of Twente, Philips Applied Technologies, Thermal Processing Group, The Netherlands; J. Meijer, Univ. of Twente, The Netherlands; D. F. de Lange, Netherlands Institute for Metals Research , The Netherlands; H. Kettelarij, Philips Applied Technologies, Thermal Processing Group, The Netherlands |
| 11:20 | **#Fr2-6 (051570-2)**<br>**Damage-free laser slotting of silicon wafers for inkjet printer heads**<br>D. Perrottet, Y. Kozuki, B. Richerzhagen Synova SA, Switzerland |
| 11:40 | **#Fr2-7 (051576-2)**<br>**Characterization of laser induced charging damage in laser micromachining**<br>J-S. Yeo, Hewlett-Packard Company, USA |
| 12:00 | **#Fr2-8 (051335-1)**<br>**Diode-pumped solid-state laser applications in solar cell manufacturing**<br>M. Li, A. Guadano, Spectra-Physics, Newport Corporation, USA |

**LUNCH TIME**

| **LPM-26 Film Deposition**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(9:00-10:30, 90min.)** | | **HPL-15 Hybrid Welding 1**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(9:00-10:10, 70min.)** | |
|---|---|---|---|
| **TIME** | **Chair: S. Nishio, Ritsumeikan Univ., Japan** | **TIME** | **Chair: P. Denney, Edison Welding Institute, USA** |
| **9:00** | **#Fr3-1 (050945-1) INVITED**<br>**Laser-induced high-rate photon plasma CVD synthesis of diamond coatings in air**<br>S. Metev, BIAS - Bremer Institut für angewandte Strahltechnik, Germany | **9:00** | **#Fr4-1 (051271-1) INVITED**<br>**Study on hybrid laser welding with novel self-adaptive optical device for shipbuilding applications**<br>Z. Cheng, Z. Zhang, Shanghai Institute of Optics and Fine Mechanics, CAS, China |
| **9:30** | **#Fr3-2 (051711-1)**<br>**Laser-assisted chemical vapor deposition of carbon-nanotube-based structures**<br>Y. F. Lu, J. Shi, Dept. of Electrical Eng., Univ. of Nebraska –Lincoln, USA; Y. S. Lin, S. H. Liou, Dept. of Physics and Astronomy, Univ. of Nebraska-Lincoln, USA | **9:30** | **#Fr4-2 (051877-1) STUDENT**<br>**Development of hybrid laser-rotating arc welding process**<br>H. Chae, C. Kim, J-H. Kim, Advanced Welding and Joining Team, KITECH, Republic of Korea; S. Rhee, Dept.of Precision Mechanical Engineering, Hanyang Univ., Republic of Korea |
| **9:50** | **#Fr3-3 (050792-2)**<br>**High-pulse energy excimer lasers for precise material ablation**<br>B. Fechner, R. Delmdahl, Coherent Lambda Physik GmbH, Germany | **9:50** | **#Fr4-3 (051813-1)**<br>**Effects of Interaction between the arc and laser plume on metal transfer in pulsed GMA/$CO_2$ laser hybrid welding**<br>T. Sugino, S. Tsukamoto, G. Arakane, T. Nakamura, National Institute for Materials Science, Steel Research Center, Japan |
| **10:10** | **#Fr3-4 (050809-1) STUDENT**<br>**Effect of laser fluence on poly-crystallized hydroxyapatite film coated by PLD method**<br>K. Ishibashi, M. Katto, A. Kameyama, T. Higashiguchi, A. Yokotani, S. Kubodera, Univ. of Miyazaki, Japan; K. Kurosawa, JST Satellite Miyazaki, Japan; T. Nakayama, H. Katayama, Kinki Univ., Japan; M. Tsukamoto, N. Abe, JWRI, Osaka Univ., Japan | | None |
| **COFFEE BREAK** | | | |
| **LPM-27 Optics & Systems**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(10:50-12:10, 80min.)** | | **HPL-16 Hybrid Welding 2**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(10:50-12:10, 80min.)** | |
| **TIME** | **Chair: E. Ohmura, Osaka Univ., Japan** | **TIME** | **Chair: T. Ishide, Mitsubishi Electric Corporation, Japan** |
| **10:50** | **#Fr3-5 (051929-1)**<br>**Wave-front correction of LD for micro-processing**<br>T, Jitsuno, Institute of Laser Engineering, Osaka Univ., Japan; K. Tokumura, NALUX Co., Ltd., Japan | **10:50** | **#Fr4-4 (051700-1)**<br>**Laser and hybrid welding of high strength steeels**<br>F. Briand, O. Dubet, P. Lefebvre, G. Ballerini, K.Niki, AIR LIQUIDE/CTAS, France |
| **11:10** | **#Fr3-6 (051054-1)**<br>**Development of long-focal-depth diffractive lens for femtosecond laser pulses**<br>K. Watatani, K. Fuse, Electronics & Materials R&D Laboratories, Sumitomo Electric Industries, Ltd., Japan; M. Shiozaki, Analysis Technology Research Center, Sumitomo Electric Industries,Ltd., Japan; K. Kurisu, K. Ebata, Electronics & Materials R&D Laboratories, Sumitomo Electric Industries, Ltd., Japan | **11:10** | **#Fr4-5 (052312-2)**<br>**Droplet transfer and spattering during YAG laser-MAG arc hybrid welding of steel**<br>Y. Naito, M. Mizutani, S. Katayama, Joining and Welding Research Institute (JWRI), Osaka Univ., Japan; F. Briand, Air Liquide, France |
| **11:30** | **#Fr3-7 (051544-1)**<br>**Demands on focus geometry characterization for laser micro- and nano-processing**<br>O. Märten, R. Kramer, H. Schwede, V. Brandl, S. Wolf, Primes GmbH, Germany | **11:30** | **#Fr4-6 (051063-1) STUDENT**<br>**Three-dimensional analysis of molten pool in laser-GMA hybrid welding**<br>J-H. Cho, S-J. Na, Dept. of M. E., Korea Advanced Institute of Science and Technology, Republic of Korea |
| **11:50** | **#Fr3-8 (051506-1)**<br>**Small and simple laser interferometer for UV lithography systems and astronomical mirrors testing**<br>G. Popov, E. Popov, Ukraine | **11:50** | **#Fr4-7 (051895-1)**<br>**Microstructure and mechanical properties of laser, MAG and laser-MAG hybrid welds of high strength steels**<br>M. Kutsuna, Z. Liu, Graduate School of Engineering, Nagoya Univ., Japan |
| **LUNCH TIME** | | | |

| **LPM SPECIAL SESSION SP L3-3**<br>**Laser Processing for Biomedical Applications 3**<br>**(Room 1 (Science Hall), East District #1 Bldg., 4F)**<br>**(13:30-14:40, 70min.)** | | **LPM-25**<br>**Microprocessing for Electronics Industry II**<br>**(Room 2 (AV Room), East District #1 Bldg., 4F)**<br>**(13:30-15:00, 90min.)** | |
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| **TIME** | **Chair: A. Vogel, Univ. of Luebeck, Germany** | **TIME** | **Chair: K. Yasui, Mitsubishi Electric Corporation, Japan** |
| **13:30** | **#Fr1-9 (1.16E) INVITED**<br>**Laser-assisted preparation and characterization of core-shell Fe@Au nanoparticles for biological applications**<br>B. Simard, J. Zhang, Z. Jakubek, Y. Deslandes, M. Post, National Research Council of Canada–Steacie Institute for Molecular Sciences, Canada | **13:30** | **#Fr2-9 (051697-1) INVITED**<br>**Laser patterning method with dynamic focus control**<br>T. Shindo, Y. Uchinono, Matsushita Electric Works, Ltd., Japan |
| **14:00** | **#Fr1-10 (051160-1)**<br>**Synthesis of colloidal silicon nanoparticles by pulsed laser ablation in liquids**<br>I. Umezu, H. Senoo, A. Sugimura, Konan Univ., Dept. of Physics, Japan | **14:00** | **#Fr2-10 (051914-1)**<br>**Laser cutting systems for FPD glasses**<br>S. S. Lee, Laser R&D Center, Korean Laser Company, Republic of Korea |
| **14:20** | **#Fr1-11 (052054-1)**<br>**Colloidal nanomaterials produced by femtosecond laser ablation in liquids**<br>M. Meunier, A. Kabashin, S. Besner, F. Winnik, P. Boyer, Laser Processing Laboratory, Dept. of Engineering Physics, Ecole Polytechnique de Montréal, Canada | **14:20** | **#Fr2-11 (050895-1)**<br>**Experiment and modeling of soft mark formation on glass and silicon by nanosecond laser pulses**<br>X. Fang, H. Osada, S. Kamiya, S. Koyama, Y. Tabata, Sigma Koki Co., Ltd., Japan |
| | **#Fr1-12 (051099-2) CXLD 5/12**<br>**Fabrication of bioactive HA/Ti composite coating by laser cladding**<br>S. Yang, Inner Mongolia Univ. of Technology, The Hong Kong Polytechnic Univ., China; H. C. Man, The Hong Kong Polytechnic Univ., China | **14:40** | **#Fr2-12 (051612-1)**<br>**Open circuit repairing by laser-induced plasma-assisted ablation on transparent material**<br>Q. Xie, DSI-Data Storage Institute Agency for Science, Technology and Research, Singapore; M. H. Hong, DSI-Data Storage Institute Agency for Science, Technology and Research, Singapore, Dept. of Electrical and Computer Engineering, National Univ. of Singapore, Singapore; B. C. Lim, K. S. Tiaw, L. P. Shi, DSI-Data Storage Institute Agency for Science, Technology and Research, Singapore; T.C. Chong, DSI-Data Storage Institute Agency for Science, Technology and Research, Singapore, Dept. of Electrical and Computer Engineering, National Univ. of Singapore, Singapore |
| **COFFEE BREAK** | | | |

| **LPM-28 Laser Devices & Light Source**<br>**(Room 3, East District, #1 Bldg., 4F)**<br>**(13:40-15:00, 80min.)** | | **HPL-17 Plastic Joining**<br>**(Room 4, West District, #4 Bldg., 2F)**<br>**(13:40-15:00, 80min.)** | |
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| **TIME** | **Chair: T. Jitsuno, Osaka Univ., Japan** | **TIME** | **Chair: Y. Kawahito, Osaka Univ., Japan** |
| **13:40** | **#Fr3-9 (050921-1) STUDENT**<br>**Emission characteristics of fast neutral particles and ions from laser-produced plasma for EUV light source with Sn target**<br>Y. Hashimoto, A. Matsumoto, H. Tanaka, Dept. of Electrical and Electronic Systems Engineering, Graduate School of Information Science and Electrical Engineering, Kyushu Univ., Japan; A. Takahashi, Dept. of Health Sciences, School of Medicine, Kyushu Univ., Japan; T. Okada, Dept. of Electrical and Electronic Systems Eng., Graduate School of Information Science and Electrical Engineering, Kyushu Univ., Japan | **13:30** | **#Fr4-8 (051577-1)**<br>**Quasi-simultaneous laser welding of plastics - The influence of parameters on weld quality**<br>A. Jansson, VTT Industrial Systems, Finland |
| **14:00** | **#Fr3-10 (051440-1) STUDENT**<br>**Analysis of second harmonic generation considering laser absorption with repetitive irradiation of focused beam**<br>K. Nomura, E. Ohmura, Y. Hirata, Dept.of Manufacturing Science, Graduate School of Engineering, Osaka Univ., Japan | **14:00** | **#Fr4-9 (051888-1)**<br>**Halogen beam sissted laser welding of 3-D shaped polymers in automotive applications**<br>M. Schmidt, T. Frick, Bayerisches Laserzentrum gGmbH, Germany; A. Hofmann, S. Hierl, LPKF AG, Germany |
| **14:20** | **#Fr3-11 (051891-1) STUDENT**<br>**Longitudinally excited UV laser pumped by lamp-like discharge for microfabrication**<br>K. Uno, ILE-Institute of Laser Engineering, Osaka Univ., Japan; K. Nakamura, Kobe Shinwa Women's Univ., Japan; J. Kawanaka, ILE-Institute of Laser Engineering, Osaka Univ., Japan; T. Goto, Japan Steel Works Ltd., Japan; T. Jitsuno, ILE-Institute of Laser Engineering, Osaka Univ., Japan | **14:20** | **#Fr4-10 (051466-1)**<br>**$CO_2$ laser welding of thermoplastics without causing surface damage assisted by a transparent solid heat sink**<br>Y. Kurosaki, Cooperative Research Center, Univ.of Electro-Communications, Japan; T. Matayoshi, Electric & Engineered Materials Lab., Mitsui Chemicals, Inc., Japan; K. Sato, Dept. of Mechanical System Engineering, Hiroshima Institute of Technology, Japan |
| **14:40** | **#Fr3-12 (1.25E)**<br>**Electronically-variable-pulse-duration laser for material processing**<br>L. A. Eyres, J. J. Morehead, J. Gregg, D. Richard, W. Grossman, W. Wiechmann, JDSU, USA | **14:40** | **#Fr4-11 (053374-1)**<br>**Laser welding of plastics by absorbance control**<br>T. Kihara, Y. Hatase, Orient Chemical Industries, Ltd., Japan |
| **COFFEE BREAK** | | | |

## JS-01 Joint Session Crossover Regions of LPM and HPL

**(Room 1 (Science Hall), East District #1 Bldg., 4F)**

**(15:20-16:40, 80min.)**

**Chair: K. Sugioka, RIKEN, Japan**

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| **15:20** | **#Fr1-13 (052311-1) INVITED**<br>**Laser-assisted metal and plastic (LAMP) joining**<br>S. Katayama, Y. Kawahito, Joining and Welding Research Institute (JWRI), Osaka Univ., Japan; A. Tange, S. Kubota, Research Center, Toyobo, Ltd., Japan |
| **15:50** | **#Fr1-14 (052323-2)**<br>**Local melting of glass material and its application to direct fusion welding by ps-laser pulses**<br>I. Miyamoto, Osaka Univ., Japan; A. Horn, J. Gottmann, Lehrstuhle für Lasertechnik, RWTH-Aachen, Germany |
| **16:10** | **#Fr1-15 (051452-1) INVITED**<br>**Perspectives of laser processing and new applications**<br>R. Poprawe, Fraunhofer-Institute für Laser Technology, Aachen, Laboratory for Laser Technology at the RWTH Aachen, President of the German Scientific Laser Association WLT, Germany; S. Kaierle, D. Petring, K. Wissenbach, Fraunhofer-Institute für Laser Technology, Aachen, Germany; W. Schulz, Fraunhofer-Institute für Laser Technology, Aachen, Laboratory for Non Linear Dynamics of Laser Processing at the RWTH Aachen, Germany |
| **16:40** | **Outstanding Student Poster Paper Awards** |

**Closing Remarks**