

LPM2002

The 3rd International Symposium on Laser Precision Microfabrication

Monday 27 May, MO Hall

	Session 1: Laser Patterning & Structuring	14:00 - 15:20
14:00	• Laser induced rear ablation process of metal thin films, Tomokazu Sano, Hirokazu Yamada, Kousuke Komorita, Etsuji Ohmura, Isamu Miyamoto, Osaka University (Japan) [1201] • Laser direct patterning for applying to FPD, Sung-han Kim, Suk-chang Oh, Kang-ug Lee, Hyoung-shik Kang, Soon-kug Hong, LG Production Engineering Research Center (Korea) [1202] • Laser structuring technology on MID, Masahide Muto, Yoshiyuki Uchinono, Masayuki Hirota, Matsushita Electric Works, Ltd. (Japan) [1203] • Laser adjustment of the beryllium copper sheet by use of temperature gradient mechanism, Kosaku Kitada, Nobuyuki Asahi, Matsushita Electric Works, Ltd. (Japan) [1204]	

Monday 27 May, Meeting Room 2

14:00	Session 2: Laser Microwelding	14:00 - 15:40
	• Process spread reduction of the micro-spot welding process for thin copper parts using real-time control, P. Dunias, T. Blom, J. de Kramer, W. Hoving, Philips Electronics Nederland B.V. (Netherlands) [1312] • YAG laser micro welding of stainless steel and shape memory alloy, Keisuke Uenishi, Masanori Seki, Takeshi Kunimasa, Masaya Takatsugu, Kojiro F. Kobayashi, Osaka University; Takeshi Ikeda, Akihiro Tsuboi, Fine Process Co. Ltd. (Japan) [1211] • Clearwelda laser transmission welding of thermoplastic polymers: light transmission and color considerations, Scott Hartley, Robert A. Sallavanti, GENTEX Corporation (USA) [1212] • Energy-sharing for laser welding in the HDD industry, Scott Hartley, Varut Yoochoon, Wuttichai Sungkasub, Voravuth Chavai, Franz-Josef Kahlen, KR Precision Ltd. (Thailand) [1213]	
15:40	Coffee Break (15:40-16:00)	
16:00	Session 3: Microdrilling & Cutting	16:00 - 17:40
	• Modeling and investigation of melt ejection dynamics for laser drilling with short pulses, Andreas Ruf, Detlef Breitling, Peter Berger, Friedrich Dausinger, Helmut Hugel, IFSW, University of Stuttgart (Germany) [1215] • Thermal analysis and quality prediction of via hole drilled on Si device by short pulse laser, Kiyokazu Yasuda, Masahiro Yasuda, Kozo Fujimoto, Osaka University (Japan) [1216] • Precision microfabrication with Q-switched CO₂ lasers, Corey Dunskey, Electro Scientific Industries (USA) [1217] • Waterjet-guided laser processing, Bernold Richerzhagen, SYNOVA (Switzerland); Muneharu Kutsuna, Nagoya University; Haruhiko Okada, Itochu Mechatronics Corp.; Takeshi Ikeda, Fine Process Co, Ltd. (Japan) [1218] • Diffraction/refractive hybrid F-theta lens for laser drilling of multilayer printed circuit boards, Keiji Fuse, Takeshi Okada, Keiji Ebata, Sumitomo Electric Industries, Ltd. (Japan) [1219]	

Tuesday 28 May, Meeting Room 2

9:00	Session 4: Fundamentals of Laser-Matter Interaction 9:00-10:50 • Diagnostics of particle dynamics during deposition of optically functional thin films by laser ablation (Invited Paper), Tatsuo Okada, Kyusyu University (Japan) [1227] • Laser ablation plume of FeSi₂ alloy target studied by TOF mass and optical emission spectroscopies, Aiko Narazaki, Tadatake Sato, Yoshizo Kawaguchi, Hiroyuki Niino, Akira Yabe, National Institute of Advanced Industrial Science and Technology (Japan) [1228] • Time-resolved monitoring of ZnO plume by ArF laser ablation: Influence of surrounding gas, Yoshizo Kawaguchi, Aiko Narazaki, Tadatake Sato, Hiroyuki Niino, Akira Yabe, National Institute of Advanced Industrial Science and Technology (Japan) [1229] • The numeric simulation of the intensive proton beam ablation of the target materials, P.Y. Lee, N. Kinoshita, A. Kasamatsu, T. Kamiya, K. Kasuya, Tokyo Institute of Technology (Japan); N.M. Bulgakova, Russian Academy of Sciences (Russia) [1230]
10:50	Coffee Break (10:50 – 11:00)
11:10	Session 5: Laser Micromachining 11:00 - 12:30 • Micro-machining using high peak power, high repetition rate, short pulse planar waveguide CO₂ lasers (Invited Paper), Howard J. Baker, Francisco J. Villarreal, Denis R. Hall, Heriot-Watt University (UK) [1235] • Laser-induced backside wet etching of fused silica with aqueous solutions containing organic molecules, Ximing Ding, Yoshizo Kawaguchi, Hiroyuki Niino, Akira Yabe, AIST (Japan) [1236] • Laser-based technology for SNOM-tips fabrication: study of kinetics and progress in measuring, V.P. Veiko, N.B. Voznesensky, S.A. Volkov, L.N. Kaporsky, A.N. Kalachev, St. Petersburg Federal Institute of Fine Mechanics and Optics; S.I. Vavilov, State Optical Institute (Russia) [1237] • Laser precision microfabrication, how precise it could be?, Hong-Bo Sun, Osaka University; Satoshi Kawata, Japan Science and Technology Corporation (Japan) [1238]
12:40	Vendors Reception (12:30 - 13:30) Meeting Room 1
13:30	Lunch (13:30 – 14:00)
14:00	Session 6 : MEMS & Micro Devices 14:00 - 15:30 • Laser-induced forward transfer direct-write of miniature sensor and microbattery systems (Invited Paper), A. Pique, C.B. Arnold, K.E. Swider-Lyons, R. Wartena, B. Pratap, R.C.Y. Auyeung, D.W. Weir, R. Andrew McGill, D.B. Chrisey, Naval Research Laboratory (USA) [1241] • Laser machining of 3D parts for microturbines, G. Hong, Andrew S. Holmes, Imperial College (UK) [1242] • True 3D volumetric patterning of a photo-ceram material using pulsed UV laser irradiation and variable exposure processing, F.E. Livingston, W.W. Hansen, H. Helvajian, The Aerospace Corporation (USA) [1244] • Laser-based MEMS microfabracation on semiconductor and polymer substrates, Bin Lan, Ming Hui Hong, Kaidong Ye, Shixin Chen, Tow Chong Chong, Data Storage Institute and National University of Singapore (Singapore) [1245]
15:30	Coffee Break (15:30 - 16:00)
16:00	Session 7 : Medical and Biological Applications 16:00 - 17:30 • Fabrication of biochemical IC chips by laser 3-D fabrication (Invited Paper), Koji Ikuta, Nagoya University (Japan) [1246] • Nonlaminar micro photo-stereolithography using LCD live-motion mask, Hideaki Nishino, Takashi Miyoshi, Yasuhiro Takaya, Satoru Takahashi, Osaka University (Japan) [1247] • Laser Surface Modification of Titanium Alloy Surface, Mingwei Li, Mark Keirstead, Spectra-Physics, Inc.; Steven Mwenifumbo, NeShante Morris, Wole Soboyejo, Princeton University (USA) [1248] • Laser manipulation of bio-/biomimetic materials, H. Misawa, S. Juodkazis, University of Tokushima; S. Matsuo, A. Yamaguchi, K. Sasaki, J. Hotta, Hokkaido University (Japan) [1249]

Wednesday 29 May, Meeting Room 2

9:00	Session 8: Nanotechnology 9:00 - 10:30 • Laser manufacturing of 3-D nanostructure and its application (Invited Paper), Michael Stuke, Max-Planck-Institute (Germany) [1251] • Nanometer-scale optical processing of single perylene microcrystals by scanning near-field optical probe, J. Niitsuma, T. Fujimura, T. Itoh, Osaka University; H. Kasai, S. Okada, H. Oikawa, H. Nakanishi, Tohoku University (Japan) [1252] • Formation of nanostructures on surface of SiC by laser radiation, Artur Medvid, Baiba Berzina, Laima Trinkler, Riga Technical University (Latvia); Leonid Fedorenko, Nikolai Yusupov, Institute of Semiconductor Physics (Ukraine); Lucel Sirghi, Tomuo Yamaguchi, Mitsuru Aoyama, Shizuoka University (Japan) [1253] • Towards nano-process applications with laser-cooled silicon atoms, Hiroshi Kumagai, Katsumi Midorikawa, RIKEN; Yuichi Asakawa, RIKEN, Keio University; Minoru Obara, Keio University (Japan) [1254]
10:30	Coffee Break (10:30 – 10:50)
10:50	Session 9: Nanoparticles 10:50 – 12:40 • Metal nanocomposites for all-optical switching (Invited Paper), Carmen N. Afonso, Instituto de Optica, CSIC (Spain) [1255] • Laser induced nanoparticles in solution, Guoxin Chen, Minghui Hong, Xiaohua Liu, Weijie Wang, Yong Feng Lu, Tow Chong Chong, DSI, National University of Singapore (Singapore) [1256] • Fabrication of well-defined nanostructure by accumulation of uniform nanoparticles, N. Aya, S. Kano, T. Seto, M.Hirasawa, T. Orii, K. Sakiyama, H. Shimura, AIST, National Institute of Advanced Industrial Science and Technology (Japan) [1257] • Synthesis of monodispersed silicon nanocrystallites and application to opto-electronic devices, Takehito Yoshida, Toshiharu Makino, Nobuyasu Suzuki, Yuka Yamada, Matsushita Electric Industrial Co., Ltd. (Japan) [1258] • Characteristics of electric devices made by direct nanoparticle spraying, Yuji Kawakami, Eiichi Ozawa, Vacuum Metallurgical Co., Ltd. (Japan) [1259]
12:40	Lunch (12:40 – 14:00)
14:00	Poster Session (14:00 – 15:30) MO Hall
15:30	Coffee Break (15:30 - 16:00)
16:00	Session 10 : Thin Film Deposition 16:00 - 17:40 • Preparation of polyperinaphthlenic organic semiconductor (PPNOS) nano-particles by excimer laser ablation and application of a few electric / electronic devices, Satoru Nishio, Kazuyuki Tamura, Jun Murata, Hirokuni Matsukawa, Junko Kitahara, Teruhiko Kan, Akiyoshi Matsuzaki, Mie University; Nobuo Ando, Yukinori Hato, Kanebo, LTD. (Japan) [1261] • Refractive index of SiO₂ thin films deposited by pulsed laser deposition with silicone targets for fabricating waveguide devices, Masayuki Okoshi, Masaaki Kuramatsu, Hiromitsu Takao, Narumi Inoue, National Defense Academy (Japan) [1262] • Pulsed-laser deposition of Ce:YIG thin film on different substrates, Yoshiki Nakata, Tatsuo Okada, Mitsuo Maeda, Kyushu University; Sadao Higuchi, Kiyotaka Ueda, Central Research Institute of Electric Power Industry (Japan) [1263] • Diamond-like carbon films by pulsed laser deposition with additional laser irradiation to plume, Tatsuya Shinozaki, Zhi Ying Che, Toshihiko Ooie, Tetsuo Yano, AIST, National Institute of Advanced Industrial Science and Technology (Japan) [1264]
	Banquet (: Hotel Osaka Sun-palace) 19:00 – 21:00

Thursday 30 May, Meeting Room 2

9:00	Session 11: Annealing & Surface Treatment 9:00 - 10:30 • Laser tuning silicon microdevices for analogue microelectronics (Invited Paper), M. Meunier, Y. Savaria, Ecole Polytechnique de Montreal, LTRIM-Technologies; M. Ducharme, M. Cadotte, Y. Liao, J.Y. Degorce, Ecole Polytechnique de Montreal; A. Lacourse, Y. Gagnon, LTRIM-Technologies (Canada) [1273] • 300 W XeCl excimer laser annealing and sequential lateral solidification in low temperature poly silicon technology, Burkhard Fechner, Lambda Physik Japan Co., Ltd.; Naoyuki Kobayashi, The Japan Steel Works, LTD (Japan); Klaus Pippert, Mark Schiwek, Lambda Physik AG; Hans-Jurgen Kahlert, MicroLas Lasersystem GmbH, (Germany) [1274] • Laser-induced shock wave removal of chemical-mechanical polishing slurries from silicon wafers, J.M. Lee, S.H. Cho, IMT Co. Ltd.; J.G. Park, S.H. Lee, Hanyang University; Y.P. Han, S.Y. Kim, Samsung Electronics Co. Ltd (Korea) [1275] • Physical mechanisms of liquid-assisted laser cleaning, J. Lee, D. Chang, D. Kim, POSTECH (Korea) [1276]
10:30	Coffee Break (10:30 – 10:50)
10:50	Session 12: Laser Optics & Systems 10:50 – 12:50 • Development of low absorption AR and PR coatings for CO₂ laser by ion assisted deposition, Hiromi Iwamoto, Keiji Ebata, Hirokuni Nanba, Sumitomo Electric Industries, Ltd (Japan) [1277] • Influence of laser absorption by nonlinear optical crystal to SHG efficiency, Etsuji Ohmura, Kazufumi Nomura, Isamu Miyamoto, Osaka University (Japan) [1278] • Beam-splitting ZnSe diffractive optical element, Kenichi Kurisu, Takayuki Hirai, Toshihiko Ushiro, Keiji Fuse, Takeshi Okada, Keiji Ebata, Sumitomo Electric Industries, LTD (Japan) [1279] • 3-D beam tailoring for laser material processing, Z.J. Laczik, University of Oxford (UK) [1280] • ConoProbe and ConoLine, two new 3-dimensional measurement systems, Gabriel Sirat, Optical Metrology Ltd. (Israel) [1281] • Development of beam pointing compensating optical system for aspheric beam shaper of PWB laser drilling system, Koki Ichihashi, Daiji Narita, Yasuhiro Mizutani, Katsuichi Ukita, Hidehiko Karasaki, Matsushita Industrial Equipment Co., Ltd. (Japan) [1282]
12:50	Lunch (12:50 – 13:50)
13:50	Session 13: Laser Devices (1) 13:50 - 15:50 • A kilowatt average power laser with sub-picosecond pulses for materials science and materials processing (Invited Paper), H.F. Dylla, S.V. Benson, G. Biallas, D. Douglas, G.R. Neil, R. Evans, A. Grippo, J. Gubeli, K. Jordan, M.J. Kelley, R. Li, J. Mammosser, L. Merminga, J. Preble, M. Shinn, T. Siggins, R. Walker, G. P. Williams, B. Yunn, Thomas Jefferson National Accelerator Facility (USA) [1284] • A few hundred femtosecond FEL with a few kW average and one GW peak power for academic and industrial applications, Eisuke J. Minehara, Ryoichi Hajima, Masaru Sawamura, Ryoji Nagai, Nobuyuki Nishimori, Nobuhiro Kikuzawa, Masayoshi Sugimoto, Toshihiko Yamauchi, Taketo Hayakawa, Toshiyuki Shizuma, Japan Atomic Energy Research Institute (Japan) [1285] • Extreme ultra-violet light sources: state of the art, future developments and potential applications (Invited Paper), Uwe Stamm, XTREME Technologies GmbH (Germany) [1286] • Low pressure F₂ laser for material processing, Takahisa Jitsuno, Institute of Laser Engineering; Osaka University, K. Nakamura, Kobe-Shinwa Women's University; T. Goto, Komatsu Research Center (Japan) [1287] • Tuneable MOPA laser system for micro-machining applications, F.J. Villarreal, J. Ramirez, F. Monjardin, K. Gulia, H.J. Baker, D.R. Hall, Heriot Watt University (UK) [1288]
15:50	Coffee Break (15:50 - 16:10)
16:10	Session 14 : Laser Devices (2) 16:10-18:00 • Materials processing with diode-pumped solid-state lasers (Invited Paper), Alan Petersen, OEM Business Unit Spectra-Physics Lasers, Inc. (USA) [1290] • Pico-second laser system for photomask repair with nano-meter accuracy, Takuya Togawa, Atsushi Ueda, Yukio Morishige, Yoshikazu Suzuki, NEC Corporation (Japan) [1291] • Temporal pulse shaping using fiber laser technology: nano-scaling for flexible industrial laser material processing, Heinrich Endert, Raj Patel, Zaza Sartania, Michelle L. Stock, IMRA America, Inc. (USA) [1292] • New concept: high power fiber disk laser, Ken-ichi Ueda, University of Electro-Communications; Hiroshi Sekiguchi, HOYA Corporation (Japan) [1293]

Friday 31 May, Meeting Room 2

9:00	Session 15: Surface Modification (1) 9:00 - 10:30 • Selective thermo-/photochemical treatment of materials -a new trend in laser micro technology (Invited Paper), Simeon Metev, C. Wochnowski, G. Sepold, BIAS (Germany) [1295] • Improvement of PET/aluminum adhesion after an excimer laser irradiation or a low pressure plasma treatment, Sophie Petit, Patricia Laurens, Cooperation Laser Franco-Allemande, CLFA; Jacques Amouroux, Farzi Arefi-Khonsari, Laboratoire des Racteurs Plasmas et Traitements de Surface, E.N.S.C.P. (France) [1296] • Laser photochemical modification of polymers and applications in optical information technology, Simeon Metev, C. Wochnowski, G. Sepold, BIAS (Germany) [1297] • Surface activated bonding for copper plate by excimer laser irradiation, Takashi Suzuki, Minoru Nishida, Takao Araki, Ehime University (Japan) [1298]
10:30	Coffee Break (10:30 – 11:00)
11:00	Session 16: Surface Modification (2) 11:00 - 12:30 • Athermal optical waveguide filter fabricated by short pules laser irradiation (Invited Paper), Junji Nishii, Kenji Kintaka, AIST Kansai (Japan) [1299] • High-speed and efficient control of refractive index change of fused silica by multiwavelength excitation process using F₂ and KrF excimer lasers, Kotaro Obata, Koji Sugioka, Tatsuya Kono, Koichi Toyoda, Hiroshi Takai, Katsumi Midorikawa, RIKEN (Japan) [1300] • Measurement of the refractive index and extinction coefficient of the metal surface heated with a short pulsed laser, H. Igarashi, S. Takeishi, T. Yagi, Tokai University; K. Kita, Suruga-seiki Co. (Japan) [1301] • Local annealing of monolithic NiTi shape memory alloy with excimer laser, Qiong Xie, Minghui Hong, Tow Chong Chong, DSI, National University of Singapore; Wei Min Huang, Nanyang Technological University (Singapore) [1302]
12:30	Lunch (12:30 – 14:00)
14:00	Session 17: Practical Applications 14:00 - 15:10 • Status and evolution of laser precision microfabrication in France (Invited Paper), Worlgang Knapp, Cooperation Laser Franco-Allemande (France) [1303] • Laser-induced-plasma assisted ablation and its applications, M.H. Hong, D.J. Wu, K.J. Chew, Y.F. Lu, T.C. Chong, Data Storage Institute (Singapore); K. Sugioka, K. Midorikawa, RIKEN (Japan) [1304] • Micro-processing using UV solid-state laser systems with high repetition rate, A. Ostendorf, K. Kulik, F. Otte, Laser Zentrum Hannover e.V. (Germany) [1305]
15:10	Coffee Break (15:10 – 15:30)
15:30	Session 18 : Industrial Applications 15:30 - 16:50 • Laser material processing applications in the data storage industry (Invited Paper), James Brannon, IBM (USA) [1306] • Laser microprocessing in the microelectronics industry: current trends and new challenges (Invited Paper), Willem Hoving, Philips Electronics (Netherlands) [1307] • Laser micro manufacturing of moulds and forming parts, Arnold Gillner, Alexander Bayer, Andreas Dohrn, Li-Ya Yeh, Fraunhofer Institut fur Lasertechnik (Germany) [1308]