

LAMP2019

The 8th International Congress on Laser Advanced Materials Processing
LPM2019 — The 20th International Symposium on Laser Precision Microfabrication
HPL2019 — The 8th International Symposium on High Power Laser Processing

May 21 – 24, 2019

Hiroshima, Japan

<http://www.jlps.gr.jp/lamp/lamp2019/>

LAMP2019 Tentative Program

updated May 9, 2019

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Program

Oral Session

Day 1: May 21, Tuesday

Hall "Himawari"

Opening

Chair: Koji Sugioka, RIKEN, Japan; General Chair of LAMP2019

10:00 Opening Remark

Hall "Himawari"

Plenary Session

Chair: Seiji Katayama, Emeritus Prof., Osaka University, Japan;
NADEX Co. Ltd., Japan

10:10 TuM-1 **Plenary** A120290

Q-LEAP STELLA and related japanese national projects for smart laser manufacturing, Kenichi L. Ishikawa¹, ¹Research Institute for Photon Science and Laser Technology, The University of Tokyo, Japan

10:50 TuM-2 **Plenary** A121930

Localized source and sink systems of photons in nanometric region and their applications for devices and fabrications, Tadashi Kawazoe¹, ¹Institute of Advanced Laser technology, Tokyo Denki University, Japan

11:30 TuM-3 **Plenary** A121149

Digital photonic production for a better future of the global society, Reinhart Poprawe¹, Arnold Gillner¹, Dieter Hoffmann¹, Reinhard Noll¹, Henrich Schleifenbaum¹, ¹Fraunhofer ILT Aachen, Germany

12:10 Lunch Time

Session 1. Hall "Himawari"
LPM: LPM 20th Year Anniversary Session

Chair: Koji Sugioka, RIKEN, Japan: General
 Chair of LAMP2019

13:30 TuM-L4 A122860

Introductory talk: History of LPM, Koji Sugioka¹, ¹*Center for Advanced Photonics, RIKEN, Japan*

13:40 TuM-L5 **Invited** A120508

Advances of glass welding and its future prospect - science and technology, Isamu Miyamoto^{1,2}, Kristian Cvecek^{2,3}, Michael Schmidt^{2,3,4}, ¹*Osaka University, Japan*, ²*Erlangen Graduate School of Advanced Optical Technologies (SAOT), Germany*, ³*Friedrich-Alexander-University Erlangen Nuremberg, Germany*, ⁴*Bayerisches Laserzentrum, Germany*

14:10 TuM-L6 **Invited** A120606

Laser Precision Microfabrication (LPM): 20 years of controlled material forming, process diagnostics and physical conversion, Henry Helvajian¹, ¹*Physical Sciences Laboratories, The Aerospace Corporation, USA*

14:40 TuM-L7 **Invited** A121523

Review on laser structuring - from micrometer to nanometer precision within 20 years, Andreas Ostendorf¹, ¹*Applied Laser Technologies, Ruhr University Bochum, Germany*

15:10 Coffee Break

Session 5. Room 4
HPL 1: Simulation & Fundamentals

Chair: Toshiharu Muramatsu, JAEA, Japan

13:30 Tu5-H1 **Invited** A121749

Fluid dynamical defect mechanisms in laser beam welding, Andreas Otto¹, Rodrigo Gómez Vázquez¹, ¹*Institute of Production Engineering and Photonic Technologies, TU Wien, Austria*

14:00 Tu5-H2 A120213

Influences of surface pretreatments on absorptivity changes induced by laser beam processing, Helge Kügler¹, Frank Vollertsen^{1, 2}, ¹*BIAS - Bremer Institut für angewandte Strahltechnik GmbH, Germany*, ²*University of Bremen, Germany*

14:20 Tu5-H3 A120067

Thermal effect to photopolymerization process, Evaldas Stankevicius¹, Zygmantas Prielaidas¹, Gediminas Raciukaitis¹, ¹*FTMC, Lithuania*

14:40 Tu5-H4 **Student** A121995

Short wavelength pyrometry by photon counting/application for temperature measurement in laser oxygen cutting, Abbas Hamie¹, Matthieu Schneider¹, Nicolas Ranc¹, ¹*PIMM laboratory, Paris, France*

15:00 Coffee Break

Session 2. Hall "Himawari"**LPM: SP1-1 "Laser synthesis and processing in liquids"**

Chairs: Tsuyoshi Asahi, Ehime University, Japan;
Stephan Barcikowski, University of
Duisburg-Essen, Germany

15:30 TuM-L8 **Invited** A120272

Chances of pulsed laser irradiation of colloidal nanoparticles for optoelectronic applications, Hongqiang Wang¹, ¹State Key Laboratory of Solidification Processing, Center for Nano Energy Materials, School of Materials Science and Engineering, Northwestern Polytechnical University and Shaanxi Joint Laboratory of Graphene, Xi'an, China

16:00 TuM-L9 **Student** A120287

Fe₃O₄/Fe₂O₃ composite sphere-particles prepared by ns laser irradiation to α -Fe₂O₃ powder in water, Ryo Kihara¹, Akari Shigetaka¹, Tsubasa Isshiki¹, Hiroyuki Wada², Saeki Yamamuro¹, Tsuyoshi Asahi¹, ¹Graduate School of Science and Engineering, Ehime University, 3 Bunkyo, Matsuyama, Ehime, Japan, ²Department of Chemical Science and Engineering School of Materials and Chemical Technology, Tokyo Institute of Technology, 4259 Nagatsuta, Midori, Yokohama, Japan

16:20 TuM-L10 A120224

Tailoring of magnetic properties of composite particles fabricated by pulsed laser irradiation, Zaneta Swiatkowska-Warkocka¹, Tatiana Itina², Alexander Pyatenko³, Naoto Koshizaki⁴, Marta Wolny-Marszalek¹, ¹Institute of Nuclear Physics, Krakow, Poland, ²Laboratoire Hubert Curien, Saint-Etienne, France, ³National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, ⁴Hokkaido University, Sapporo, Japan

16:40 TuM-L11 A120966

Femtosecond laser-induced assembly of nanomaterials based on multi-photon reduction, Hiroaki Nishiyama¹, Yuya Ogawa¹, Kaito Kimura¹, Kan Umetsu¹, ¹Yamagata University, Japan

17:00 close

Session 3.**Room 2****LPM: 3D Micro- and nano-fabrication 1**

Chair: Henry Helvajian, The Aerospace Corporation, USA

15:30 Tu2-L1 A120915

3D microfluidic biochips for cancer cell migration in nanometer-sized spaces fabricated by femtosecond laser processing, Felix Sima^{1,4}, Hiroyuki Kawano², Atsushi Miyawaki², Lorand Kelemen³, Pal Ormos³, Dong Wu¹, Jian Xu¹, Katsumi Midorikawa¹, Koji Sugioka¹, ¹RIKEN Center for Advanced Photonics, Japan, ²BSI, RIKEN, Japan, ³BRC, Institute of Biophysics, Hungarian Academy of Sciences, Szeged, Hungary, ⁴CETAL, National Institute for Lasers, Plasma and Radiation Physics, Magurele, Ilfov, Romania

15:50 Tu2-L2 A120336

Highly sensitive 3D microfluidic SERS chips fabricated by all-femtosecond-laser-processing for real-time sensing, Shi Bai¹, Anming Hu², Koji Sugioka¹, ¹Advanced Laser Processing Research Team, RIKEN Center for Advanced Photonics, RIKEN, Saitama, Japan, ²Department of Mechanical Aerospace and Biomedical Engineering, University of Tennessee Knoxville, USA

16:10 Tu2-L3 **Invited** A122488

Femtosecond laser microfabrication for 3D microoptical devices and biomimetic microstructures, Dong Wu¹, Chaowei Wang¹, Yanlei Hu¹, Jiawen Li¹, ¹Micro/Nano Engineering Laboratory, University of Science and Technology of China, Hefei, China

16:40 Tu2-L4 **Student** A120896

Three-dimensional micro-printing in glass with picosecond laser pulses: Overcoming the degradation in the axial resolution with low numerical aperture focal systems, Peng Wang¹, Wei Chu¹, Ya Cheng^{1,2,3}, ¹State Key Laboratory of High Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China, ²State Key Laboratory of Precision Spectroscopy, School of Physics & Materials Science, East China Normal University, China, ³XXL-The Extreme Optoelectromechanics Laboratory, East China Normal University, China

17:00 Tu2-L5 A120916

Picosecond laser 3D processing of foturan glass: Towards fabrication of complex large area microfluidics, Felix Sima¹, Florin Jipa¹, Stefana Iosub^{1,2}, Cristian Butnaru¹, Emanuel Axente¹, Gabriela Ghiritoiu², Livia Elena Sima², Koji Sugioka³, ¹CETAL, National Institute for Lasers, Plasma and Radiation Physics, Magurele, Ilfov, Romania, ²Institute of Biochemistry of the Romanian Academy, Bucharest, Romania, ³RIKEN, Center for Advanced Photonics, Saitama, Japan

17:20 close

Session 4. Room 3
LPM: Fundamental aspects

Chair: Daisuke Nakamura, Kyushu University, Japan

15:30 Tu3-L1 **Student** A120258
Modeling of laser induced micro-jets generated by liquid confining devices, Hamid Ebrahimi Orimi^{1,2}, Sivakumar Narayanswamy^{2,4}, Christos Boutopoulos^{1,3}, ¹Centre de Recherche Hôpital Maisonneuve-Rosemont, Canada, ²Department of Mechanical, Industrial and Aerospace Engineering, Concordia University, Canada, ³Department of Ophthalmology, Faculty of Medicine, University of Montreal, Canada, ⁴Department of Mechanical Engineering, SRM University, India

15:50 Tu3-L2 **Student** A120197
Numerical analysis about flow characteristics of interaction between fume particles and protective gas in low vacuum laser welding system, Yongki Lee^{1,2}, Jason Cheon¹, Byung-kwon Min², Cheolhee Kim¹, ¹Korea Institute of Industrial Technology, South Korea, ²Yonsei University, South Korea

16:10 Tu3-L3 A120140
Two-fluid model to simulate metal powder bed fusion additive manufacturing, Noriko Watari¹, Yuzuru Ogura¹, Noriko Yamazaki¹, Toshiya Watanabe², ¹Research & Innovation Center, Mitsubishi Heavy Industries, Ltd., Japan, ²Research & Innovation Center, Mitsubishi Heavy Industries, Ltd., Japan

16:30 Tu3-L4 **Student** A120271
Measurement of gas flow rates using laser-induced breakdown spectroscopy, Sangwoo Yoon¹, Joochan Kim¹, ¹Seoul National University of Science and Technology, Seoul, Korea.

16:50 Tu3-L5 A120266
Laser-induced ejection of millimeter-sized liquid droplet from metal surface with ns-lasers at two different pulse duration, H. Niino¹, T. Sakai², S. Ookuma², N. Okada², Y. Kato³, T. Kurita³, T. Kawashima³, ¹RISC, National Institute of Advanced Industrial Science and Technology (AIST), Japan, ²Corporate Manufacturing Engineering Center, Toshiba Corp, Japan, ³Industrial Development Center, Hamamatsu Photonics K. K., Japan

17:10 close

Session 6. Room 4
HPL 2: Additive Manufacturing 1

Chair: Yoshinobu Makino, Toshiba Energy Systems & Solutions Corporation, Japan

15:30 Tu6-H5 **Invited** A121303
3D printing of multiple materials and functionally graded components using modified selective laser melting, Lin Li¹, Chao Wei¹, Xiaoji Zhang¹, Yuan-Hui Chueh¹, ¹Laser Processing Research Centre, School of Mechanical, Aerospace and Civil Engineering, The University of Manchester, UK

16:00 Tu6-H6 A121470
Latest AM technology and solutions for real applications, Takashi Ishide¹, ¹Executive Expert, Mitsubishi Heavy Industries, Ltd., Japan

16:20 Tu6-H7 A120250
Optimizing of gas atomize conditions to produce metal powder for additive manufacturing, Taketoshi Yamada¹, Toshihumi Aoyama¹, Yuji Soda¹, Masahiro Nakamura², Masaya Hatanaka³, Yoshinao Komatsu³, ¹Mitsubishi Steel mfg. Co.,Ltd, Japan, ²Mitsubishi Heavy Industries, Ltd., Nagoya, Japan, ³Mitsubishi Heavy Industries, Ltd., Hyogo, Japan

16:40 Tu6-H8 A120913
Development of additive manufacturing technology for gas turbine components, Shuji Tanigawa¹, Shuho Tsubota¹, Masato Kataoka², Takanao Komaki², ¹Mitsubishi Heavy Industries, Japan, ²Mitsubishi Hitachi Power Systems, Japan

17:00 Tu6-H9 A122861
Recent advances in additive manufacturing at GE, Thomas Pang¹, ¹GE Additive, Japan

17:20 close

Day 2: May 22, Wednesday

Session 7. Room 1

LPM: SP1-2 "Laser synthesis and processing in liquids"

Chairs: Tsuyoshi Asahi, Ehime University, Japan;
Stephan Barcikowski, University of
Duisburg-Essen, Germany

9:00 We1-L1 A120014

**Alloy nanoparticles by laser ablation in liquids-
high material variety for fundamental studies
and applications in biomedicine,** Christoph
Rehbock¹, Stephan Barcikowski¹, ¹*University of
Duisburg-Essen, Technical Chemistry I, Essen,
Germany*

9:20 We1-L2 A120217

**Synthesis of Fe@FeOx particles by laser
ablation and their phase transition induced by
laser irradiation,** Dongshi Zhang¹, Koji Sugioka¹,
¹*Center for Advanced Photonics,, RIKEN, Wako,
Saitama, Japan*

9:40 We1-L3 *Student* A120093

**Transfer processes of thermal energy in
high-repetition-rate, ultrashort-pulsed laser
synthesis of colloids,** Friedrich Waag¹, Bilal Gökce¹,
Stephan Barcikowski¹, ¹*Technical Chemistry I,
University of Duisburg-Essen, Germany*

10:00 *Coffee Break*

Session 10. Room 2

LPM: Surface treatment 1

Chair: Dong Wu, USTC-the University of Science
and Technology of China, China

8:50 We2-L1 *Invited* A120230

**Laser processing of self-assembled plasmonic
metasurfaces,** Nicholas A. Charipar¹, Heungsoo
Kim¹, Jeffrey Geldmeier², Scott A. Trammell², Kristin
M. Charipar¹, Jawad Naciri², Alberto Piqué¹, Jake
Fontana², ¹*Naval Research Laboratory, Materials
Science & Technology Division, USA*, ²*Naval Research
Laboratory, Center for Biomolecular Science &
Engineering, USA*

9:20 We2-L2 *Student* A120298

**Ultrafast laser structuring within a process
chain - influence of the surface morphology,**
Andreas Brenner¹, Martin Osbild¹, Johannes Finger¹,
¹*Fraunhofer Institute for Laser Technology,
Steinbachstr. 15, Germany, Aachen, 52074*

9:40 We2-L3 A120312

**Fabrication of optical metasurfaces with UV
femtosecond laser pulses,** Martynas Beresna¹,
Timothy Lee¹, Behrad Gholipour¹, Nikolay I.
Zheludev¹, Gilberto Brambilla¹, ¹*Optoelectronics
Research Centre, University of Southampton, United
Kingdom*

10:00 *Coffee Break*

Short Presentations for Poster Sessions

LPM Poster Session Room 1

Chair: Yasuhiro Okamoto, Okayama University,
Japan

10:20 Short Presentations for LPM Poster
Sessions I and II

HPL Poster Session Room 4

Chair: Kiyokazu Mori, The Graduate School for
The Creation of New Photonics Industries,
Japan

11:30 Short Presentations for HPL Poster
Session

Conference Management Room (B1 Floor)

Poster Sessions and Exhibition

LPM Poster Session I (For odd-numbered posters)

12:10 LPM Poster Session I and Exhibition
& Lunch Time

HPL Poster Session

12:10 HPL Poster Session and Exhibition
& Lunch Time

Session 13.

Room 3

LPM: 3D Micro- and nano-fabrication 2

Chair: Mitsuhiro Terakawa, Keio University, Japan

8:50 We3-L1 A120927

Direct laser writing of chirped photonic crystals for optical field enhancement, Ryosuke Hommura¹, Kestutis Staliunas², Vygantas Mizeikis¹, ¹Research Institute of Electronics, Shizuoka University, Japan, ²Institució Catalana de Recerca i Estudis Avançats (ICREA), Spain

9:10 We3-L2 A120202

Model-based feature size analysis of pure proteinaceous microstructures fabricated by femtosecond laser direct write, Daniela Serien¹, Koji Sugioka¹, ¹RIKEN Center for Advanced Photonics, Japan

9:30 We3-L3 Student A120307

4Pi multiphoton polymerization for improving axial resolution, Titas Tičkūnas^{1,2}, Vytautas Purlys^{1,2}, Roaldas Gadonas^{1,2}, ¹Laser Research Center, Vilnius University, Lithuania, ²Femtika Ltd., Lithuania

9:50 We3-L4 Student A120899

Characterization of 3D laser exposure patterns in photoresist by photoluminescence quenching, E. Yulianto¹, S. Chatterjee¹, V. Mizeikis¹, ¹Shizuoka University, Japan

10:10 Coffee Break

Session 16.

Room 4

HPL 3: Welding 1

Chair: Hiroto Yamaoka, IHI Corporation, Japan

9:00 We4-H1 Invited A122547

Process strategies in high power laser-beam welding, Peter Berger¹, ¹Vice Director, IFSW, Germany

9:30 We4-H2 A120936

Multi spot modules to improve joining processes due to tailored spot geometries, Axel Luft¹, Markus Baumann¹, ¹Laserline GmbH, Germany

9:50 We4-H3 A120162

Effect of oxides flux on improvement of bead appearances and on prevention of hot cracking in high power laser welding, Youzou Ashida¹, Ryo Nomura¹, Takahiro Deguchi¹, ¹NADEX LASER R&D Center, NADEX PRODUCTS Co.,Ltd., Japan

10:10 We4-H4 A121296

Application of high power laser vacuum welding to rolled clad steel plate production process, Yasuaki Okita¹, Yasushi Kitani¹, Tomoaki Fukahori¹, ¹JFE Steel Corporation, Japan

10:30 We4-H5 Student A120950

Development of single-pass vertical welding on heavy-thick steel plate using hot-wire laser welding, Sittisak Charunetratsamee¹, Motomichi Yamamoto¹, Kenji Shinozaki¹, Hiroshi Yajima², Naoki Oda³, Hideki Aono⁴, ¹Graduate School of Engineering, Hiroshima University, Japan, ²Yajima Material Integrity Laboratory, Japan, ³Nippon Steel & Sumitomo Metal Corporation, Japan, ⁴Matsumoto Kikai Co., Ltd., Japan

10:50 We4-H6 A120339

Development of laser welding for the ITER toroidal field coil, Takehisa Okuda¹, Yasushi Nishijima², Daisuke Hara², Shuho Tsubota¹, ¹Mitsubishi Heavy Industries Ltd., Takasago, Hyogo, Japan, ²Mitsubishi Heavy Industries Ltd., Kobe, Hyogo

11:10 Coffee Break

Short Presentations for Poster Sessions

Room 1

LPM Poster Session

Chair: Yasuhiro Okamoto, Okayama University, Japan

10:20 Short Presentations for LPM Poster Sessions I and II

Room 4

HPL Poster Session

Chair: Kiyokazu Mori, The Graduate School for The Creation of New Photonics Industries, Japan

11:30 Short Presentations for HPL Poster Session

Conference Management Room (B1 Floor)

Poster Sessions and Exhibition

LPM Poster Session I (For odd-numbered posters)

12:10 LPM Poster Session I and Exhibition & Lunch Time

HPL Poster Session

12:10 HPL Poster Session and Exhibition & Lunch Time

Session 8. Room 1
LPM: SP1-3 "Laser synthesis and processing in liquids"

Chair: Hongqiang Wang, Northwestern Polytechnical University, Xi'an, P. R. China

14:00 We1-L4 **Invited** A120138

Synthesis of metal nanoparticles by femtosecond laser-induced plasma in organometallic solution, Tomoyuki Yatsuhashi¹, Yuki Horikawa¹, Takuya Okamoto¹, ¹*Department of Chemistry, Graduate School of Science, Osaka City University, Japan*

14:30 We1-L5 A120234

Kinetics and mechanisms of laser-induced photochemistry in solution, Katharine Moore Tibbetts¹, Mallory G. John¹, Laysa M. Frias Batista¹, Collin J. Rodrigues¹, ¹*Department of Chemistry, Virginia Commonwealth University, Richmond, VA, USA*

14:50 We1-L6 **Student** A120741

Photochemical free laser-induced crystallization of nitrate salts, Yusron Darajat¹, Watheq Al-Basheer¹, Abdulaziz Aljalal¹, Khaled Gasmi¹, ¹*Department of Physics, Saudi Arabia*

15:10 We1-L7 **Student** A120238

Kinetic control of gold nanoparticle growth in laser plasma using hydroxyl radical scavengers, Laysa Frias Batista¹, Katharine Moore Tibbetts¹, ¹*Department of Chemistry, Virginia Commonwealth University, USA*

15:30 *Coffee Break*

Session 11. Room 2
LPM: Advanced laser applications

Chair: Aiko Narazaki, AIST, Japan

14:00 We2-L4 A120716

DUV laser processing of ceramic matrix composites (CMC), Yasuhiro Kamba¹, Ryoichi Nohdomi¹, Taisuke Miura¹, Hiroaki Oizumi¹, Hironori Igarashi¹, Chen Qu¹, Yuki Tamaru¹, Atsushi Fuchimukai¹, Yohei Tanaka¹, Yujiro Sasaki¹, Yoshihiko Murakami¹, Junichi Fujimoto¹, Hakaru Mizoguchi¹, ¹*Gigaphoton Inc., Japan*

14:20 We2-L5 A120146

Trends in high power excimer laser microprocessing, Burkhard Fechner¹, Ralph Delmdahl¹, ¹*Coherent LaserSystems GmbH & Co. KG, Germany*

14:40 We2-L6 A120023

Enabling multi-wavelength lasers interaction with silicon on polyimide toward flexible CMOS-circuits/sensors, Wen-Hsien Huang¹, Ming-Hsuan Kao¹, Hsing-Hsiang Wang¹, Yu Huang², Chang-Hong Shen¹, Jia-Min Shieh^{1,2}, ¹*Taiwan Semiconductor Research Institute (TSRI), National Applied Research Laboratories, HsinChu, Taiwan,* ²*Department of Photonics and Institute of Electro-Optical Engineering, National Chiao-Tung University, Hsinchu, Taiwan*

15:00 We2-L7 **Student** A120866

Laser rapid thermal annealing of biofunctionalized GaAs/AlGaAs nanoheterostructures, Hakim Grib¹, Jan J. Dubowski¹, ¹*Université de Sherbrooke, Canada*

15:20 We2-L8 A120259

Femtosecond laser irradiation aided low-temperature thermal anneal of Ni electrode on SiC, Takuro Tomita¹, Hiroki Kawakami¹, Yoshiki Naoi¹, ¹*Graduate School of Advanced Technology and Science, Tokushima University, Japan*

15:40 *Coffee Break*

Session 14. Room 3

LPM: Ultrashort pulse laser processing 1

Chair: Yoshiki Nakata, Osaka University, Japan

14:00 We3-L5 **Student** A120244

High-quality microfabrication of monocrystalline diamond by picosecond pulsed laser, Atsuya Kajitani¹, Takahiro Simose¹, Yasuhiro Okamoto¹, Togo Sinonaga¹, Akira Okada¹, ¹*Graduate School of Natural Science and Technology, Okayama University, Japan*

14:20 We3-L6 **Student** A120510

Regulation of the silver-containing nanocrystals in PTR glass exposed by ultrashort laser pulses, Xu Wang¹, Yunjie Zhang², ¹*State Key Laboratory of Transient Optics and Photonics, Xi'an Institute of Optics and Precision Mechanics of CAS*, ²*School of Science, Xi'an Polytechnic University*

14:40 We3-L7 **Student** A120303

In-situ analysis of heat accumulation during ultrashort pulsed laser ablation, Benedikt Bornschlegel¹, Johannes Finger², ¹*Chair for Laser Technology LLT - RWTH Aachen University, Germany*, ²*Fraunhofer Institute for Laser Technology ILT, Germany*

15:00 We3-L8 **Invited** A121143

Ablation of dielectrics with ultrashort laser pulses: Investigation of ionization mechanisms and outcomes, Olivier Uteza¹, Corinne Pasquier¹, Marc Sentid¹, Nicolas Sammer¹, ¹*Aix-Marseille University, CNRS, LP3, France*

15:30 Coffee Break

Session 17. Room 4

HPL 4: Monitoring

Chair: Teruyoshi Kadoya, LTF-Laser Technology Fountain, Japan

14:00 We4-H7 **Invited** A120541

Advanced laser material processing: How OCT sets new standards, Rüdiger Moser¹, Matthias Strebel¹, Ehsan Zahedi¹, Florian Opitz¹, Stephan André², Tobias Beck², Markus Kogel-Hollacher¹, ¹*Precitec GmbH & Co. KG, Germany*, ²*Precitec Optronik GmbH, Germany*

14:30 We4-H8 **Student** A120201

Monitoring and closed-loop building height controller for LMD-processes, Thomas Berners¹, Alexander Eppel¹, Christian Brecher¹, ¹*Laboratory for Machine Tools and Production Engineering (WZL) of RWTH Aachen University, Germany*

14:50 We4-H9 **Student** A121203

High-speed imaging of laser ablation process using parallel phase-shifting interferometry, Koichiro Yasuda², Ryota Takagi², Ktsuhiro Ishii¹, Kazuhisa Fujita¹, Hideaki Shirai², Akihiro Tsuboi¹, ¹*The Graduate School for Creation of New Photonics Industries in Japan*, ²*DENSO CORPORATION in Japan*

15:10 We4-H10 A120188

Study on intellectualization of laser processing with machine learning -parameter suggesting and in-process monitoring-, Kiyokazu Mori^{1,2}, Toshiyuki Kusumoto¹, ¹*The Graduate School for The Creation of New Photonics Industries, Japan*, ²*Kanagawa Institute of Industrial Science and Technology, Japan*

15:30 Coffee Break

Session 9. Room 1**LPM: SP1-4 "Laser synthesis and processing in liquids"**

Chair: Tomoyuki Yatsushashi, Osaka City University, Japan

16:00 We1-L8 **Invited** A122598

Synthesis of cocatalysts by pulse laser ablation in liquid for photocatalytic hydrogen production, D. Amaranatha Reddy¹, Yujin Kim¹, Rory Ma¹, Tae Kyu Kim¹, ¹*Department of Chemistry, Yonsei University, South Korea*

16:30 We1-L9 A120141

Amorphous transitional metal oxides from laser ablation in liquids for photocatalytic hydrogen production, Zhaoyong Lin¹, Chun Du¹, Bo Yan¹, Guowei Yang¹, ¹*Sun Yat-sen University, China*

16:50 We1-L10 A120268

Pulsed laser post processing of transition metal oxides for defect-engineering and catalysis research applications, Sven Reichenberger¹, Swen Zerebecki¹, Marcus Lau², Baoxiang Peng³, Astrid Müller⁴, Martin Muhler³, Stephan Barcikowski¹, ¹*Laboratory of Industrial Chemistry, Ruhr-University Bochum, Germany*, ²*TRUMPF Laser- und Systemtechnik GmbH, Germany*, ³*Technical Chemistry I and Center for Nanointegration Duisburg-Essen (CENIDE), Research Center for Nano Energy Technology (NETZ), Duisburg, University of Duisburg-Essen, Germany*, ⁴*Department of Chemical Engineering, University of Rochester, USA*

17:10 We1-L11 **Student** A120236

One-step synthesis of catalytically active silica-metal nanoparticles via femtosecond reactive laser ablation in liquid (fs-RLAL), Mallory G. John¹, ¹*Virginia Commonwealth University, United States*

17:30 close

Session 12. Room 2**LPM: Nano ripple**

Chair: Jan J. Dubowski, Université de Sherbrooke, Canada

16:00 We2-L9 A120280

Theoretical and experimental investigation of the formation of high spatial frequency periodic structures on solids irradiated by ultrashort laser pulses, Nikolay A. Kirichenko¹, Ekaterina V. Barmina¹, Georgy Shafeev¹, ¹*Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia*

16:20 We2-L10 A120216

Hierarchical microstructures with high spatial frequency laser induced periodic surface structures (HSFLs) possessing different orientations created by high-fluence femtosecond laser ablation of silicon in liquids, Dongshi Zhang¹, Koji Sugioka¹, ¹*RIKEN Center for Advanced Photonics, Wako, Saitama, Japan*

16:40 We2-L11 **Invited** A120616

Role of hydrodynamic mechanisms in formation of femtosecond laser-induced periodic surface structures, Evgeny L Gurevich¹, Stella Maragkaki^{1,2}, Yoann Levy³, Thibault J.-Y. Derrien³, Nadezhda M. Bulgakova³, ¹*Ruhr University Bochum, Applied Laser Technologies, Germany*, ²*IESL FORTH, Heraklion Crete, Greece*, ³*HiLASE Centre, Institute of Physics of the Czech Academy of Sciences, Czech Republic*

17:10 We2-L12 **Student** A120196

Effect of high pulse repetition rate for achieving micro/nano surface structures on Ti6Al4V using femto second laser micromachining, Muruges Munaswamy¹, G. L. Samuel¹, ¹*Indian Institute of Technology Madras, India*

17:30 We2-L13 A119969

Pressure-dependent formation of laser-induced periodic surface structures on copper, Masato Kubo¹, Shigeki Matsuo¹, ¹*Shibaura Institute of Technology, Japan*

17:50 close

Session 15. Room 3**LPM: Ultrashort pulse laser processing 2**

Chair: Olivier Uteza, University of Aix-Marseille, France

- 16:00 We3-L9 **Invited** A120612
Additive/subtractive 3D structuring of glass interposer for ultra-dense silicon photonics I/O, Gligor Djogo¹, Stephen Ho¹, Moez Haque¹, Erden Ertorer¹, Jianzhao Li¹, Jun Liu², Xiaolu Song², Jing Suo², Peter R. Herman¹, ¹*The Edward S. Rogers Sr. Department of Electrical and Computer Engineering, University of Toronto, Toronto, Canada*, ²*Optical & Microwave Technology Research Department, Huawei Technologies Co., Ltd., China*
- 16:30 We3-L10 A120304
Advanced ultrafast laser bessel beam for machining metallic materials, Huu-Dat Nguyen¹, Sedao^{1,2}, Nicolas Faure¹, Cyril Mauclair^{1,2}, Razvan Stoian¹, ¹*Laboratoire Hubert Curien, UMR CNRS 5516, Saint-Etienne, France*, ²*GIE Manutech-USD, Saint-Etienne, France*
- 16:50 We3-L11 A120006
Beam deflection technologies for ultra short pulse lasers, Holger Schlüter¹, Ze'ev Kirshenboim², ¹*SCANLAB GmbH, Germany*, ²*Migdal Ha-Emek, Israel*
- 17:10 We3-L12 **Student** A120507
Inscription of waveguide Bragg gratings with ultrashort Bessel beams, Guodong Zhang^{1,2}, Guanghua Cheng^{1,2}, Razvan Stoian², ¹*State Key Laboratory of Transient Optics and Photonics, Xi'an Institute of Optics and Precision Mechanics, CAS, Xi'an, China*, ²*Laboratoire Hubert Curien, UMR 5516 CNRS, Université de Lyon, Université Jean Monnet, 42000 Saint Etienne, France*
- 17:30 We3-L13 **Student** A120222
Impact of high-peak power laser beam on transmission losses of hollow-core antiresonant optical fibres, Shouyue Wu¹, Bartłomiej Siwicki¹, Richard M. Carter¹, Jonathan D. Shephard¹, Fei Yu², Duncan P. Hand¹, ¹*Institute of Photonics and Quantum Sciences, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, UK*, ²*Centre for Photonics and Photonic Materials, Department of Physics, University of Bath, Bath, UK*
- 17:50 close

Session 18. Room 4**HPL 5: Additive Manufacturing 2**

Chair: Jingbo Wang, Panasonic Smart Factory Solutions Co., Ltd., Japan

- 16:00 We4-H11 **Invited** A120118
Laser additive manufacturing of (Ti3Al+TiB)/Ti composite for high temperature application, Zhuguo Li¹, Yueqiao Feng¹, Kai Feng¹, Chengwu Yao¹, ¹*Shanghai Jiao Tong University, P.R. China*
- 16:30 We4-H12 A121297
Innovative aerospace and space structures made by additive manufacturing, Elena Lopez¹, Mirko Riede¹, Juliane Moritz¹, Michael Müller¹, Frank Brückner^{1,2}, Christoph Leyens^{1,3}, ¹*Fraunhofer Institute for Material and Beam Technology IWS, Dresden, Germany*, ²*Luleå University of Technology, Sweden*, ³*Technische Universität Dresden, Germany*
- 16:50 We4-H13 A120322
Laser synthesis of materials for laser additive manufacturing, Stephan Barcikowski¹, Tim Hupfeld¹, René Streubel¹, Michael Schmidt², Johannes Henrich Schleifenbaum³, Bilal Gökce¹, ¹*Technical Chemistry I, University of Duisburg-Essen and Center for NanoIntegration Duisburg-Essen CENIDE, Germany*, ²*Department of Photonic Technologies, University of Erlangen-Nuremberg and Bayerisches Laserzentrum, Germany*, ³*Digital Additive Production, RWTH Aachen University and Fraunhofer Institute of Laser Technology, Germany*
- 17:10 We4-H14 A120053
Mpact of powder application on particle incorporation during direct metal deposition, Joerg Volpp¹, Himani Siva Prasad¹, ¹*Department of Applied Physics and Mechanical Engineering, Luleå University of Technology, Sweden*
- 17:30 We4-H15 A120308
The microstructure and mechanical properties of Stellite-6/WC coatings produced by laser cladding and synchronous powder feeding method, Guangyuan Wang¹, Jiazi Zhang¹, Sen Yang¹, ¹*Nanjing University of Science and Technology*
- 17:50 close

Day 3: May 23, Thursday

Session 19. Room 1

LPM: SP1-5 "Laser synthesis and processing in liquids"

Chair: Takeshi Tsuji, Shimane University, Japan

9:00 Th1-L1 A122485

Graphite carbon encased gold nanoparticles with specific reaction channels as ultrastable oxygen reduction electrocatalysts, Changhao Liang⁴, ¹*Institute of Solid State Physics, China*

9:20 Th1-L2 A120018

Oxygen evolution reaction in nearly neutral solution catalyzed by CoO-based multiphase nanoparticles prepared by femtosecond laser ablation in water, Teppei Nishi¹, Yuichiro Hayasaka², Tomiko M. Suzuki¹, Shunsuke Sato¹, Takahiro Nakamura³, Shunichi Sato³, Takeshi Morikawa¹, ¹*TOYOTA CENTRAL R&D LABS., INC, Japan*, ²*The Electron Microscopy Center, Tohoku University, Japan*, ³*Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan*

9:40 Th1-L3 A120215

How surfactant-free particles evolve and how prevent their evolution by ex situ photoresist functionalization, Dongshi Zhang¹, Koji Sugioka¹, ¹*RIKEN Center for Advanced Photonics, Wako, Saitama, Japan*

10:00 Coffee Break

Session 23. Room 2

LPM: Microfabrication

Chair: Ruwen Peng, Nanjing University, China

8:50 Th2-L1 A120273

Selective LIBWE on hydrophobic surface for single-cell patterning, Ji-Yen Cheng^{1,2,3,4}, Cheng-Lin Chung¹, Mei-Yi Lu¹, Hui-Fang Chang¹, ¹*Academia Sinica, Taiwan*, ²*National Taiwan Ocean University, Keelung, Taiwan*, ³*National Yang-Ming University, Taiwan*, ⁴*Chang Gung University, Taiwan*

9:10 Th2-L2 A121054

Direct laser writing technique for creating non-enzymatic and gas sensors, Evgeniia Khairullina¹, Vasilii Mironov¹, Vladimir Andrianov¹, Mizue Mizoshiri², Maxim Panov¹, Ilya Tumkin¹, ¹*Saint Petersburg State University, Russia*, ²*Nagaoka University of Technology, Japan*

9:30 Th2-L3 A121121

Direct laser printing of functional surfaces and microdevices with structured beams, Aleksandr Kuchmizhak^{1,2}, ¹*School of Natural Sciences, Far Eastern Federal University, Vladivostok, Russia*, ²*Institute for automation and control processes of FEB RAS, Vladivostok, Russia*

9:50 Th2-L4 A121894

Ultrafast laser-materials engineering and diagnostics for neural tissue engineering applications, Emmanuel Stratakis¹, ¹*Foundation for Research and Technology - Hellas (F.O.R.T.H.), Institute of Electronic Structure and Laser (I.E.S.L.), Greece*

10:20 Coffee Break

Session 27. Room 3**LPM: Ultrashort pulse laser processing 3**

Chair: Gediminas Račiukaitis, FTMC - Center for Physical Sciences and Technology, Lithuania

8:50 Th3-L1 A120274

High-rate micro hole drilling of silicon using ultrashort pulse laser radiation, Andreas Gruner¹, Lucas Naumann¹, Joerg Schille¹, Udo Loeschner¹, ¹*Laserinstitut Hochschule Mittweida, Germany*

9:10 Th3-L2 A120212

Investigation of the ablation rate of metals by means of few ultrashort laser pulses up to 100 J/cm², Dennis Haasler¹, Tobias Schneider¹, Reinhart Poprawe¹, ¹*Chair for Laser Technology (LLT), RWTH Aachen University, Germany*

9:30 Th3-L3 A120086

Adaption of energy deposition in helical drilling of multidimensional micro holes using ultrashort laser pulses, Chao He^{1,2}, Dominik Esch³, Arnold Gillner^{1,2}, ¹*RWTH Aachen University, Chair for Laser Technology LLT, Germany*, ²*Fraunhofer Institute for Lasertechnology ILT, Germany*, ³*Hochschule Bonn-Rhein-Sieg, School of Natural Sciences, Germany*

9:50 Th3-L4 A120064

Femtosecond laser drilling of copper: A modeling and experiment comparison, Yi-Hsien Liu¹, Chung-Wei Cheng¹, Jinn-Kuen Chen², ¹*Department of Mechanical Engineering, National Chiao Tung University, Taiwan*, ²*Department of Mechanical and Aerospace Engineering, University of Missouri, U.S.A.*

10:10 *Coffee Break*

Session 31. Room 4**HPL 6: Additive Manufacturing 3**

Chair: Takashi Ishide, Mitsubishi Heavy Industries, Japan; JLPS President

9:00 Th4-H1 A120338

Ultraviolet laser lithography of dielectric micropatterns, Soshu Kiriwara¹, ¹*Osaka University, Japan*

9:30 Th4-H2 A120628

Characterisation of the optical emission in laser powder bed fusion process, Emil Duong¹, Moritz Kroeger², Ulrich Thombansen¹, Christian Knaak¹, Peter Abels¹, ¹*Fraunhofer Institute for Laser Technology ILT, Germany*, ²*RWTH Aachen University - Chair for Laser Technology LLT, Germany*

9:50 Th4-H3 A120886

Microstructure and mechanical properties of carbon steels fabricated by selective electron beam melting, Kazuki Itoda¹, Kenta Aoyagi², Yuichiro Koizumi², Yuki Kawamura³, Kazuo Kikawa³, Akihiko Chiba², ¹*Graduate School of Engineering, Tohoku University, Japan*, ²*Institute for Materials Research, Tohoku University, Japan*, ³*Honda R&D Co. Ltd., Japan*

10:10 *Coffee Break*

Session 20. Room 1**LPM: SP1-6 "Laser synthesis and processing in liquids"**

Chair: Tae Kyu Kim, Pusan National University, Korea

10:30 Th1-L4 A120278

Laser fabrication of phthalocyanine nanoparticle colloids toward bio-applications, Taisei Himeda¹, Ryo Kihara, Tsuyoshi Asahi, ¹*Ehime University, Japan*

10:50 Th1-L5 A120302

Scaling of laser fragmentation in a free liquid jet for manipulation of semiconductor particles for photocatalytic application, Sven Reichenberger¹, Ina Haxhijaj¹, Astrid M. Müller², Stephan Barcikowski¹, Marcus Lau³, ¹*Technical Chemistry I, Department of Chemistry, and Center for Nanointegration Duisburg-Essen (CENIDE), University of Duisburg-Essen, Germany*, ²*Department of Chemical Engineering, University of Rochester, Rochester, New York, USA*, ³*TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, Germany*

11:10 Th1-L6 **Student** A120082

Synthesis of ultra-small gold nanoparticles by nanosecond-pulsed laser fragmentation in liquids - impact of laser intensity and electrolytes on particle size distributions, Anna Rosa Ziefuß¹, Sven Reichenberger¹, Christoph Rehbock¹, Indranath Chakraborty², Wolfgang J. Parak², Stephan Barcikowski¹, ¹*Technical Chemistry I and Center for Nanointegration, Duisburg-Essen (CENIDE), University of Duisburg-Essen, Germany*, ²*Fachbereich Physik und Chemie, CHyN, Universität Hamburg, Germany*

11:30 Th1-L7 A120165

Formation of unique nanoparticle agglomerates during laser ablation of CaO in liquids, Takeshi Tsuji¹, Ryo Antatsu², Miki Kaneko², ¹*Graduate School of Natural Science and Technology, Japan*, ²*Interdisciplinary Faculty of Science and Engineering, Japan*

11:50 Lunch Time

Session 24. Room 2**LPM: Micro-machining 1**

Chair: Udo Klotzbach, Fraunhofer-Institut für Werkstoff- und Strahltechnik, Germany

10:30 Th2-L5 A122486

Microfabrication of PDMS structures based on wave optics using EUV radiations from laser-produced plasma, Tetsuya Makimura¹, Hikari Urai¹, Eriko Kira¹, Hiroyuki Niino², ¹*University of Tsukuba, Japan*, ²*AIST, Japan*

10:50 Th2-L6 **Student** A120235

Innovative approach for high speed micromachining of 3-dimensional constructs with nanosecond laser and evaluation of the quality of the micromachined surface, Shayan Mohammadi, Pour khajani¹, Hamid Ebrahimi Orimi¹, Sivakumar Narayanswamy^{1,2}, ¹*Faculty of Mechanical Engineering, Department of Mechanical, Industrial and Aerospace Engineering, Concordia University, Montreal, QC, Canada*, ²*Department of Mechanical Engineering, SRM University, Amaravati, India*

11:10 Th2-L7 **Invited** A122859

Fabrication of 3D embedded microstructures in ceramics by integrated additive manufacturing and laser micromachining, Hai Xiao¹, Jincheng Lei¹, Yuzhe Hong², Shenglong Mu², Yang Song¹, Jianhua Tong², Fei Peng², ¹*Department of Electrical and Computer Engineering, Clemson University, South Carolina, USA*, ²*Department of Materials Science and Engineering, Clemson University, South Carolina, USA*

11:40 Th2-L8 A122862

Beam shaping with multi-plane light conversion for femtosecond laser-based material processing, Clément Jacquard¹, Pauline Boucher^{1, 2}, Antonin Billaud¹, Nicolas Laurenchet¹, Gwenn Pallier¹, Pu Jian¹, Olivier Pinel¹, Guillaume Labroille¹, ¹*Cailabs, France*, ²*Laboratoire Kastler Brossel, France*

12:00 Lunch Time

Conference Management Room (B1 floor)**LPM Poster Session II (For even-numbered posters)**

12:10 Poster Session II and Exhibition (Conference Management Room (B1 floor))

& Lunch Time

Session 28. Room 3**LPM: Ultrashort pulse laser processing 4**

Chair: Peter R. Herman, University of Toronto, Canada

10:30 Th3-L5 A120013

Modeling of femtosecond laser ablation of copper with GHz bursts, Chung-Wei Cheng¹, Jinn-Kuen Chen², ¹*Department of Mechanical Engineering, National Chiao Tung University, No. 1001, Ta Hsueh Road, Hsinchu 300, Taiwan,* ²*Department of Mechanical and Aerospace Engineering, University of Missouri, Columbia, Missouri 65211, U.S.A.*

10:50 Th3-L6 **Student** A120289

Rapid 3D micro-machining by optimised bursts of ultrashort laser pulses - beyond the ablation-cooling, Andrius Žemaitis¹, Paulius Gečys¹, Gediminas Račiukaitis¹, Mindaugas Gedvilas¹, ¹*Center for Physical Sciences and Technology, Lithuania*

11:10 Th3-L7 **Student** A120629

Multi-sensor system for real-time monitoring of laser micro-structuring, Milena Zuric¹, Oliver Nottrodt¹, Peter Abels¹, ¹*Fraunhofer Institute for Laser Technology ILT, Steinbachstr. 15, 52074 Aachen, Germany*

11:30 Th3-L8 A120150

Ultra-short laser pulse time-of-flight holographic control for sensing applications, Kristian Cvecek^{1,2,3}, Catharina Rebling³, Kilian Schütz¹, Michael Schmidt^{1,2,3}, ¹*Institute of Photonic Technologies, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany,* ²*SAOT - Erlangen Graduate School in Advanced Optical Technologies, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany,* ³*blz - Bayerisches Laserzentrum, Germany*

11:50 Th3-L9 **Student** A120281

Machining of micro channels in single crystal silicon wafer using ultra-short pulse laser for MEMS applications, Shalini Singh¹, G. L. Samuel¹, ¹*Research Scholar, Indian Institute of Technology, Madras, India,* ²*Professor*

12:10 Lunch Time

Session 32. Room 4**HPL 7: Welding 2**

Chair: Masahiro Tsukamoto, Osaka University, Japan

10:30 Th4-H4 **Invited** A120937

Laser welding of copper for e-mobility applications—Challenges, limits and strategies using different laser technologies, Andreas Heider¹, Lukas Alter¹, Christoph Bantel¹, Reiner Ramsayer¹, ¹*Robert Bosch GmbH, Germany*

11:00 Th4-H5 A120935

Blue diode laser status and outlook in technology and applications, Markus Ruetering¹, Simon Britten¹, Sörn Ocylok¹, ¹*Laserline GmbH, Germany,* ²*Laserline GmbH, Germany,* ³*Laserline GmbH, Germany*

11:20 Th4-H6 **Student** A120928

Effect of laser wavelength on welding of pure copper plate with blue diode laser, Kento Morimoto^{1,3}, Masahiro Tsukamoto², Abe Nobuyuki^{2,3}, Shin-ichiro Masuno², Kazuyuki Azumi^{2,3}, Yoshihiko Hayashi^{2,3}, ¹*Graduate School of Engineering, Osaka University, Japan,* ²*Joining and Welding Research Institute, Osaka University, Japan,* ³*OSAKA FUJI CORPORATION, Japan*

11:40 Th4-H7 A120205

High quality copper welding by high power green laser, Tsuyoshi Nakamura¹, Matthias Beranek², Ruediger Brockmann², ¹*TRUMPF Corporation, Japan,* ²*TRUMPF Laser- und Systemtechnik GmbH, Germany*

12:00 Lunch Time

Conference Management Room (B1 floor)**LPM Poster Session II (For even-numbered posters)**

12:10 LPM Poster Session II and Exhibition (Conference Management Room (B1 floor))

& Lunch Time

Session 21. Room 1
LPM: SP2-1 "Laser coloring using short and ultrashort pulsed lasers"

Chair: Andres F. Lasagni, Professur für Laserbasierte Methoden der großflächigen Oberflächenstrukturierung, Institut für Fertigungstechnik, Technische Universität Dresden, Germany

14:00 Th1-L8 **Invited** A121983

Coloring of metals using long pulse duration lasers, Arkadiusz J. Antończak¹, Katarzyna M. Łęcka¹, Łukasz Skowroński², Marek Trzcinski², Vasyl V. Kinzhybalov³, Krzysztof M. Abramski¹, ¹Laser Microprocessing Group, Faculty of Electronics, Wrocław University of Science and Technology, Poland, ²Institute of Mathematics and Physics, University of Technology and Life Sciences, Poland, ³Institute of Low Temperature and Structure Research, Poland

14:30 Th1-L9 **Invited Student** A120793

Ultra-short pulsed laser marking and coloration of metals with segmented pixel parameter transformation, Norbert Ackerl¹, Pascal Gugger¹, Maximilian Warhanek¹, Johannes Gysel², Konrad Wegener¹, ¹ETH Zurich, D-MAVT, Institute of Machine Tools and Manufacturing (IWF), Switzerland, ²Inspire AG, Switzerland

15:00 Th1-L10 **Student** A120959

Laser-induced thin oxide layers on stainless steel - wear and corrosion resistance in Ringer solution, Bogdan Szczygiel¹, Arkadiusz Jan Antonczak², Katarzyna Lecka², ¹Faculty of Chemistry, Wrocław University of Science and Technology, Poland, ²Faculty of Electronics, Wrocław University of Science and Technology, Poland

15:20 Th1-L11 **Invited tutorial** A120313

Investigation of structural colors formed on metal surface by direct laser interference patterning, Bogdan Voisiat¹, Wei Wang¹, Max Holzey¹, Andrés Fabián Lasagni^{1, 2}, ¹Technische Universität Dresden, Germany, ²Fraunhofer IWS, Germany

15:50 Coffee Break

Session 25. Room 2
LPM: Direct writing

Chair: Aiko Narazaki, AIST, Japan

14:00 Th2-L9 **Invited** A120060

Laser direct writing of conductive carbon microelectrodes and device applications, Akira Watanabe¹, Jinguang Cai², ¹Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Japan, ²Institute of Materials, China Academy of Engineering Physics, P. R. China

14:30 Th2-L10 A120247

Cu-Ni micropatterning on flexible substrates using femtosecond laser reductive sintering, Mizue Mizoshiri¹, Ha Phuong Nam¹, ¹Nagaoka University of Technology, Japan

14:50 Th2-L11 **Student** A120898

Surface morphology analysis of electrically conductive β -SiC fabricated by femtosecond laser irradiation, Shuichiro Hayashi¹, Yasutaka Nakajima¹, Mitsuhiro Terakawa^{1, 2}, ¹School of Integrated Design Engineering, Keio University, Japan, ²Department of Electronics and Electrical Engineering, Keio University, Japan

15:10 Th2-L12 A120540

Femtosecond laser fabrication of micro-optical elements on hard materials, Xue-Qing Liu¹, Lei Yu², Shuang-Ning Yang², ¹State Key Laboratory of Precision Measurement Technology and Instruments, Department of Precision Instrument, Tsinghua University, China, ²State Key Laboratory of Integrated Optoelectronics, College of Electronic Science and Engineering, Jilin University, China

15:30 Th2-L13 **Invited** A120100

Femtosecond laser direct writing in silica glass: From nanogratings to circular optical properties, Matthieu Lancry¹, Bertrand Poumellec¹, ¹University Paris Sud, France

16:00 Coffee Break

Session 29.

Room 3

LPM: Micro-welding

Chair: Hirofumi Hidai, Chiba University, Japan

14:00 Th3-L10 A120282

High yield ultrafast laser microwelding process for direct joining of metal-to-glass, Paulina Olga Morawska¹, Samuel Hann¹, Matthew Jan, Daniel Esser¹, Richard Mark Carter¹, Duncan Paul Hand¹, ¹*Applied Optics and Photonics Group, School of Engineering and Physical Sciences, Heriot-Watt University, Edinburgh, UK*

14:20 Th3-L11 A120295

Experimental characterization of spectral scattering properties of polymers for laser welding applications, Andreas Schkutow¹, Thomas Frick¹, Karsten Scholle², Samir Lamrini², Peter Fuhrberg², ¹*Technische Hochschule Nuernberg Georg Simon Ohm, Germany*, ²*Futronics Laser GmbH, Germany*

14:40 Th3-L12 A120705

Laser material interactions in pulsed and continuous wave fibre laser welding, Wojciech Suder¹, Julio Coroado¹, Marta Ostolaza¹, Supriyo Ganguly¹, Stewart Williams¹, ¹*Cranfield University, UK*

15:00 Th3-L13 A120267 **Student**

Investigation on the influence of the overlap factor during the expansion of the weld joint area with modulated laser beam welding over gap, Woo-Sik Chung¹, Alexander Olowinsky¹, ¹*Fraunfer Insititute for Laser Technology, Germany*

15:20 Th3-L14 A120263 **Student**

Absorber-free quasi-simultaneous laser welding of transparent microfluidic devices, Nam-Phong Nguyen¹, Stefan Behrens¹, Maximilian Brosda¹, Alexander Olowinsky¹, Arnold Gillner², ¹*Fraunhofer-Institut fuer Lasertechnik ILT, Germany*, ²*Fraunhofer Institute for Laser Technology,, Aachen, Germany*

15:40 Coffee Break

Session 33.

Room 4

HPL 8: Cutting & Drilling

Chair: Seiji Katayama, Emeritus Prof., Osaka University, Japan; NADEX Co. Ltd., Japan

14:00 Th4-H8 A120390 **Invited**

Recent R&D progress on laser cutting technology for nuclear power plant decommissioning at KIMM, Jeong Suh¹, Eun-Joon Chun¹, Su-Jin Lee¹, ¹*Laser Industrial Technology Research Group, Korea Institute of Machinery and Materials (KIMM), Republic of Korea*

14:30 Th4-H9 A120277

About three fundamental mysteries regarding fiber laser beam cutting of stainless steel, Dirk Petring¹, Dennis Arntz², Stoyan Stoyanov¹, Frank Schneider¹, ¹*Fraunhofer Institute for Laser Technology ILT, Germany*, ²*Chair for Laser Technology LLT, RWTH Aachen University, Germany*

14:50 Th4-H10 A120241 **Student**

Study on reduction of slope angle of kerf in thick plate cutting of mild steel by fiber laser, Seigo Kadonaga¹, Kyo Kitagawa¹, Yasuhiro Okamoto¹, Akira Okada¹, Hiroaki Ishiguro², Ryohei Ito², Akihiko Sugiyama³, Hironobu Miyoshi³, Ayako Nagase³, ¹*Graduate School of Natural Science and Technology, Okayama University, Japan*, ²*AMADA HOLDINGS CO., LTD., Japan*, ³*AMADA CO., LTD., Japan*

15:10 Th4-H11 A120279

New optimization procedure for efficient laser beam cutting of fiber reinforced plastics (GFRP and CFRP), Dirk Petring¹, Frank Schneider¹, Norbert Wolf¹, ¹*Fraunhofer Institute for Laser Technology ILT, Germany*

15:30 Th4-H12 A120166 **Student**

Delamination crack initiation of laser drilling process for multi-layer material system, You Wang¹, Torsten Hermanns², Markus Nieken², Stefan Jassen², Dennis Haasler³, Wolfgang Schulz^{1,2}, ¹*Department of nonlinear dynamics of laser processing in RWTH Aachen University, Germany*, ²*Fraunhofer institute for laser technology, Germany*, ³*Chair for laser technology in RWTH Aachen University, Germany*

15:50 Coffee Break

Session 22. Room 1**LPM: SP2-2 "Laser precision processing for Terahertz and optical applications"**

Chair: Bogdan Voisiat, Technische Universität Dresden, Germany

16:20 Th1-L12 A120286

Fabrication of LIPSS-based metallic polarization gratings, Alejandro San Blas^{1,2}, Ainhara Rodriguez^{1,2}, Noemi Casquero^{1,2}, Santiago Olaizola^{1,2}, Miguel Martinez-Calderon^{1,2}, ¹Ceit-IK4, Spain, ²Universidad de Navarra (Tecnun), Spain

16:40 Th1-L13 **Student** A120189

Terahertz tapered antireflective structures fabricated by femtosecond laser processing, Xi Yu¹, Seiya Kato¹, Michiharu Ota², Nobuhito Takizawa³, Kazuhisa Mikame³, Shingo Ono¹, ¹Nagoya Institute of Technology, Japan, ²IMRA America, Inc., Japan, ³Tamari Industry Co., LTD., Japan

17:00 Th1-L14 A120211

Laser fabrication of diffractive optical elements for THz radiation, Simonas Indrišūnas¹, Evaldas Svirplys¹, Gediminas Račiukaitis¹, Linas Minkevičius¹, Andrzej Urbanowicz¹, Irmantas Kašalynas¹, Heiko Richter², Heinz-Wilhelm Hübers², ¹Center for Physical Sciences and Technology, Lithuania, ²German Aerospace Center (DLR), Institute of Optical Sensor Systems, Germany

17:20 Th1-L15 **Student** A120058

Microstructuring NbN superconductor using pulsed laser, Manikandan E¹, Karthigeyan K A¹, Sreeja B S¹, Radha S¹, John Jesudan², Pratab Roychautri², ¹SSN College of Engineering, India, ²Tata Institute of Fundamental Research, India

17:40 To banquet

Session 26. Room 2**LPM: Direct writing: LIFT**

Chair: Akira Watanabe, Tohoku University, Japan

16:20 Th2-L14 **Invited** A121244

Fundamentals and (potential) applications of laser-induced forward transfer (LIFT) of 3D free standing microstructures, Matthias Feinaeugle¹, Ralph Pohl², Gert-willem Römer¹, ¹University of Twente, Faculty of Engineering Technology, the Department of Mechanics of Solids, Surfaces & Systems (MS3), Chair of Laser Processing, Enschede, The Netherlands, ²Demcon B.V., Institutenweg 25, Enschede, 7521 PH, The Netherlands

16:50 Th2-L15 A121038

Dynamics of double pulse LIFT, Q. Li¹, A.-P. Alloncle¹, D. Grojo¹, Ph. Delaporte¹, ¹LP3 laboratory, CNRS-Aix-Marseille University, France

17:10 Th2-L16 A120294

Bio-active patterning of fibronectin-containing apatite by laser-induced forward transfer, Aiko Narazaki¹, Ayako Oyane², Hirofumi Miyaji³, ¹Electronics and Photonics Research Institute, AIST, Japan, ²Nanomaterials Research Institute, AIST, Japan, ³Faculty of Dental Medicine, Hokkaido University, Japan

17:30 Th2-L17 A120225

LIFT of microstructures using elastomeric donor templates, Kristin M. Charipar¹, Raymond C.Y. Auyeung¹, Heungsoo Kim¹, Nicholas A. Charipar¹, Alberto Piqué¹, ¹Naval Research Laboratory, 20375 USA

17:50 Th2-L18 **Student** A120300

Laser printing of high solid content inks on flexible substrates, Pol Sopena^{1,2}, Juan Marcos Fernández-Pradas^{1,2}, Pere Serra^{1,2}, ¹Department of Applied Physics, Universitat de Barcelona, Spain, ²Institute of Nanoscience and Nanotechnology (IN2UB), Universitat de Barcelona, Spain

18:10 To banquet

Banquet

18:30 from the venue to Banquet on foot

19:00 Banquet (ANA Crowne Plaza Hotel Hiroshima, "Orchid" on 3rd floor)

Session 30.

Room 3

LPM: Micro-machining 2

Chair: Mizue Mizoshiri, Nagaoka University of Technology, Japan

16:00 Th3-L15 A121018

Multi beam ultrafast laser patterning with single beam modulation and switching, Arnold Gillner¹, Alexander Meyer¹, Oliver Nottrodt¹, Johannes Finger¹, Martin Reininghaus¹, ¹*Fraunhofer Institute for Laser Technology, Aachen, Germany*

16:20 Th3-L16 A120983

Femtosecond laser processed micro structure for micro object arrangement in a microfluidic device, Yaxiaer Yalikun¹, Misuzu Namoto¹, Chaoying Fang¹, Yoichiro Hosokawa¹, ¹*Graduate School of Materials Science, Nara Institute of Science and Technology, Japan*

16:40 Th3-L17 A120615

Fabrication of low-loss lithium niobate photonic structure with femtosecond laser assisted chemo-mechanical polishing, Min Wang¹, Rongbo Wu², Jintian Lin², Zhiwei Fang¹, Jianhao Zhang², Ya Cheng^{1, 2}, ¹*State Key Laboratory of Precision Spectroscopy, East China Normal University, Shanghai, China*, ²*State Key Laboratory of High Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, Shanghai, China*

17:00 Th3-L18 A121226

Deep drilling of metals with ultra-short laser pulses, Daniel J. Förster¹, Daniel Holder², Christian Freitag¹, Rudolf Weber², Thomas Graf², ¹*LightPulse Laser Precision, Stuttgart, Germany*, ²*Institut für Strahlwerkzeuge, Stuttgart, Germany*

17:20 Th3-L19 A120306

Asymptotic bore hole model for ultrashort pulse laser-drilled carbon fiber preforms, Stefan Janssen¹, Dorian Kürschner¹, Torsten Hermanns¹, Markus Nießen¹, Wolfgang Schulz^{1,2}, ¹*Fraunhofer Institute for Laser Technology ILT, Germany*, ²*RWTH Aachen University - Nonlinear Dynamics of Laser Manufacturing Processes Instruction and Research Department NLD, Germany*

17:40 To banquet

Session 34.

Room 4

HPL 9: Welding 3

Chair: Kazuhisa Mikame, TAMARI Industry Co., Ltd., Japan

16:00 Th4-H13 A121772 **Invited**

Improvements in laser welding and brazing processes by beam oscillation, Peer Woizeschke¹, ¹*BIAS - Bremer Institut fuer angewandte Strahltechnik GmbH, Germany*

16:30 Th4-H14 A120251

Research progress on laser keyhole welding of dissimilar steel/Al joints, Li Cui¹, Hongxi Chen¹, Feng Pan¹, Boxu Chen¹, Dingyong He¹, ¹*Beijing University of Technology, P.R.China*

16:50 Th4-H15 A121044

Dissimilar joining of advanced structural and engineering components using latest generation pulsed fibre laser, Supriyo Ganguly¹, Sonia Meco¹, Julio Corrado¹, Wojciech Suder¹, Goncalo Parda¹, Stewart Williams¹, Jack Gabzdyl², ¹*Cranfield University, UK*

17:10 Th4-H16 A120198

Evaluation of laser welding joint characteristic for dissimilar materials of oxygen free copper and aluminium, Wooseong Choi¹, Sanghoon Kang¹, Minjung Kang¹, ¹*Korea Institute of Industrial Technology*

17:30 To banquet

Banquet

18:30 from the venue to Banquet on foot

19:00 Banquet (ANA Crowne Plaza Hotel Hiroshima, "Orchid" on 3rd floor)

Day 4: May 24, Friday

Session 35.

Room 1

LPM: SP3-1 “Laser processing of glass materials: current status, trends and future”

Chair: Yves Bellouard, École Polytechnique
Fédérale de Lausanne, Switzerland

9:00 Fr1-L1 A120248

Relationship between joint strength and applied pressure in ultrafast laser microwelding of glass, Takayuki Tamaki¹, Hiroaki Ishino¹, Wataru Watanabe², ¹National Institute of Technology, Nara College, Japan, ²Ritsumeikan University, Japan

9:20 Fr1-L2 A120309

Glass welding by ultrashort pulse laser without optical contacting, Yousuke Nakamura¹, Sören Richter², Dirk Sutter³, ¹TRUMPF Corporation, Japan, ²TRUMPF Lasertechnik GmbH, Germany, ³TRUMPF Laser GmbH, Germany

9:40 Fr1-L3 A120283

Ultrafast laser microwelding of ultra-thin flexible glass, Paulina Olga Morawska¹, Matthew Jan, Daniel Esser¹, Richard Mark Carter¹, Paolo Melagari², Robert Douglas², Yun Fu Chan², Duncan Paul Hand¹, ¹Applied Optics and Photonics group, School of Engineering and Physical Sciences,, Heriot-Watt University, Edinburgh, UK, ²Centre for Process Innovation Ltd- National Printable Electronics Centre, Sedgefield, Stockton-on-Tees, UK

10:00 Coffee Break

Session 38.

Room 2

LPM: Film deposition

Chair: Arkadiusz J. Antonczak, Wrocław
University of Technology, Poland

8:50 Fr2-L1 A121824

Flexible oxide thin films prepared by ultraviolet laser-assisted chemical solution process, Tetsuo Tsuchiya¹, Yuko Uzawa¹, Iwao Yamaguchi¹, Tomohiko Nakajima¹, Junichi Momoto¹, ¹National Institute of Advanced Industrial Science and Technology (AIST), Japan

9:10 Fr2-L2 A120147

Pulsed laser deposition from Lab to Fab, Ralph Delmdahl¹, Burkhard Fechner¹, Max Fischer¹, ¹Coherent LaserSystems GmbH & Co. KG

9:30 Fr2-L3 A120245

Dual beam pulsed laser deposition of functionally graded yttria-stabilized zirconia (YSZ) thermal barrier coating with improved adhesion strength, Chun Deng¹, Hyeongwon Kim, Hyungson Ki, ¹South Korea

9:50 Fr2-L4 A120944

Selective surface activation induced by laser (SSAIL): Physical-chemical mechanism of selective copper deposition on PA 6, Karolis Ratautas¹, Aldona Jagminienė¹, Ina Stankevičienė¹, Eugenijus Norkus¹, Gediminas Račiukaitis¹, ¹Center for Physical Sciences and Technology, Lithuania

10:10 Coffee Break

Session 41. Room 3
LPM: Surface treatment 2

Chair: Toshihiko Ooie, AIST, Japan

8:50 Fr3-L1 A120988

Laser metal bumping with SUS316L molten powder jet for steel / carbon fiber reinforced thermoplastics joint, Kiyokazu Yasuda¹, Yuki Uchida¹, Rennosuke Tamura¹, Takahiro Hara², Yuji Sato², Masahiro Tsukamoto², ¹*Division of Materials and Manufacturing Science, Osaka University, Japan*, ²*Joining and Welding Research Institute, Osaka University, Japan*

9:10 Fr3-L2 A120288

Laser-textured antibacterial surfaces: An industrial approach, Laura Gemini¹, Marc Fauçon¹, Adrian H.A. Lutey², Luca Romoli², Rainer Kling¹, ¹*ALPhANOV, France*, ²*Università degli studi di Parma, Italy*

9:30 Fr3-L3 A121299

Hybrid micro textures-A multi-scale surface engineering approach for enhancing tribological characteristics, Niketh S¹, G.L. Samuel², ¹*Research Scholar, Indian Institute of Technology Madras, India*, ²*Professor, Indian Institute of Technology Madras, India*

9:50 Fr3-L4 A120059

Dry laser peening for improving fatigue properties of laser welded 2024-T3 aluminum alloy using femtosecond laser pulses, Tomokazu Sano¹, Takayuki Eimura¹, Akio Hirose¹, Yosuke Kawahito², Seiji Katayama², Kazuto Arakawa³, Ayumi Shiro⁴, Takahisa Shobu⁵, Kiyotaka Masaki⁶, Yuji Sano⁷, ¹*Division of Materials and Manufacturing Science, Graduate School of Engineering, Osaka University, Japan*, ²*Joining and Welding Research Institute, Osaka University, Japan*, ³*Interdisciplinary Faculty of Science and Engineering, Shimane University, Japan*, ⁴*Quantum Beam Science Research Directorate, National Institute for Quantum and Radiological Science and Technology, Japan*, ⁵*Materials Sciences Research Center, Japan Atomic Energy Agency, Japan*, ⁶*National Institute of Technology, Okinawa College, Japan*, ⁷*ImPACT (Impulsing Paradigm Change through Disruptive Technologies) Program under the Cabinet Office, the Government of Japan*

10:10 Coffee Break

Session 44. Room 4
HPL 10: Welding 4

Chair: Yasushi Kitani, JFE Steel Corporation, Japan

8:50 Fr4-H1 **Invited** A120183

Cold cracking susceptibility of ultra-high tensile strength steel sheet during laser welding, Ryota Mori², Naoya Takemoto¹, Motomichi Yamamoto¹, Kyohei Maeda², Reiichi Suzaki², Kenji Shinozaki¹, ¹*Hiroshima university, Japan*, ²*Kobe Steel Ltd., Japan*

9:20 Fr4-H2 **Student** A120981

Development of overlay welding technology using high-power diode laser and hot-wire system, Weian-An Lin¹, Hayato Kono¹, Motomichi Yamamoto¹, Kenji Shinozaki¹, Hideki Aono², Ryo Ejima³, ¹*Graduate School of Engineering, Hiroshima University, Japan*, ²*Matsumoto Kikai Co., Ltd., Japan*, ³*Marubun Co., Japan*

9:40 Fr4-H3 A120246

Weldability, microstructure and properties of 304 stainless steel joint: Laser welding and laser-arc hybrid welding, Jingjing Yang¹, Chunyang Zhao¹, Zemin Wang¹, Xiaoyan Zeng¹, ¹*Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology, Wuhan, PR China*

10:00 Fr4-H4 A121371

Fundamental studies on application of laser-arc hybrid welding for manufacturing primary structural members in general merchant ships, Koji Gotoh¹, Takamori Uemura², Issei Uchino^{2,3}, Hisao Narimatsu^{2,4}, Atsuo Moriyama⁵, ¹*Department of Marine Systems Engineering, Kyushu University, Japan*, ²*Department of Civil and Structural Engineering, Graduate school of Engineering, Kyushu University, Japan*, ³*Namura Shipbuilding Co. Ltd., Japan*, ⁴*Tsuneishi Shipbuilding Co., Ltd., Japan*, ⁵*Japan Ship Technology Research Association, Japan*

10:20 Coffee Break

Session 36. Room 1
LPM: SP3-2 “Laser processing of glass materials: current status, trends and future”

Chair: Toney Fernandez, Macquarie University, Australia

10:30 Fr1-L4 **Student** A120163

Experimental study on the relationship between direction of crack propagation and thermal stress distribution in laser cleaving process for glass substrate, Yuki Nakajima¹, Keiji Yamada¹, Ryutaro Tanaka¹, Katsuhiko Sekiya¹, Kazuki Fukushima¹, ¹Hiroshima University, Japan

10:50 Fr1-L5 **Student** A120078

Real-time ultrafast 2D-imaging of femtosecond laser processing by a temporal wavelength division scheme, Takakazu Suzuki¹, Hirofumi Nemoto¹, Kazuki Takasawa¹, Kazuki Matsushita¹, Yuki Yamaguchi¹, Fumihiko Kannari¹, ¹Keio University, Japan

11:10 Fr1-L6 **Invited** A120332

Laser-induced metal particle manipulation in glasses, Hirofumi Hidai¹, ¹Department of Mechanical Engineering,, Chiba University, Japan

11:40 Fr1-L7 A120284

Fabrication of tellurite glass sphere for optical resonator by non-contact glass melting due to localized-laser heating, Tetsuo Kishi¹, Tsutaru Kumagai¹, Nobuhiro Matsushita¹, Tetsuji Yano¹, ¹Tokyo Institute of Technology

12:00 Lunch Time

Session 39. Room 2
LPM: Medical and biological applications 1

Chair: Yoichiro Hosokawa, Nara Institute of Science and Technology, Japan

10:30 Fr2-L5 **Invited** A120090

Microfluidic fabrication of polymer materials using laser-induced bubble, Yasutaka Hanada¹, ¹Hirosaki University, Japan

11:00 Fr2-L6 A120204

Femtosecond laser direct write of pure fluorescent proteins, Daniela Serien¹, Abe Masashi^{1,2}, Mitsuhiro Terakawa^{2,3}, Hiroyuki Kawano⁴, Atsushi Miyawaki^{1,4}, Katsumi Midorikawa¹, Koji Sugioka¹, ¹RIKEN Center for Advanced Photonics, RIKEN, Japan, ²School of Integrated Design Engineering, Keio University, Japan, ³Department of Electronics and Electrical Engineering, Keio University, Japan, ⁴RIKEN Center for Brain Science, RIKEN, Japan

11:20 Fr2-L7 A120209

Femtosecond laser photoporation of fluorogenic peptide aptamers for highly sensitive imaging of polysaccharides in Euglena gracilis cells, Takanori Maeno¹, Takanori Uzawa², Izumi Kono², Kazunori Okano¹, Takanori Iino¹, Taro Ogawa³, Osamu Iwata³, Takuro Ito⁴, Kengo Suzuki³, Keisuke Goda⁴, Yoichiro Hosokawa¹, ¹Division of Materials Science, Nara Institute of Science and Technology, Japan, ²Nano Medical Engineering Laboratory, RIKEN, Japan, ³euglena Co. Ltd., Japan, ⁴Department of Chemistry, University of Tokyo, Japan

11:40 Fr2-L8 **Student** A120080

Evaluation of myoblast adhesion and differentiation on biodegradable polymer films with femtosecond laser fabricated micro through-holes, Izumi Takayama¹, Mitsuhiro Terakawa¹, ¹Keio University, Japan

12:00 Lunch Time

Session 42. Room 3
LPM: Surface treatment 3

Chair: Hongtao Ding, University of Iowa, USA

10:30 Fr3-L5 **Student** A120512

Dual-scale fabrication of broadband antireflective black metal surfaces based nanosecond laser and femtosecond laser, Rui Lou¹, ¹*State Key Laboratory of Transient Optics and Photonics, Xi'an Institute of Optics and Precision Mechanics, CAS, 710119 Xi'an, China*

10:50 Fr3-L6 **Student** A120878

Ablation characteristics of alumina and zirconia ceramics on ultra-short pulsed laser machining., Norbert Ackerl¹, Konrad Wegener¹, ¹*ETH Zurich, D-MAVT, Institute of Machine Tools and Manufacturing (IWF), Switzerland*

11:10 Fr3-L7 **Invited** A120227

From passive to active manipulation of the polarization states of light via metastructures, Ruwen Peng¹, ¹*National Laboratory of Solid State Microstructures, Nanjing University, China*

11:40 Fr3-L8 A120240

Laser induced modification of molybdenum disulphide nanoplatelet array, Romualdas Trusovas¹, Gediminas Račiukaitis¹, Gediminas Niaura¹, Arūnas Jagminas¹, ¹*Center for Physical Sciences and Technology, Lithuania*

12:00 Lunch Time

Session 45. Room 4
HPL 11: Automotive

Chair: Kiyokazu Mori, The Graduate School for The Creation of New Photonics Industries, Japan

10:30 Fr4-H5 **Invited** A120398

Laser beam remote welding of lightweight aluminum construction for automotive industry, Jan-Philipp Weberpals¹, Daniel Boehm¹, Martin Sommer¹, Johann Hesse², ¹*AUDI AG, Neckarsulm, Germany*, ²*AUDI AG, Ingolstadt, Germany*

11:00 Fr4-H6 **Invited** A120144

A completely new approach to fiber laser welding of automotive and e-mobility components., Peter Kallage¹, ¹*Coherent, Germany*

11:30 Fr4-H7 A120148

Laser welding of thin stainless steel parts using modified side-gas application for control of spatter and weld shape, Goran Jovic^{1,2}, Axel Bormann¹, Johannes Pröll¹, Stefan Böhm², ¹*Robert Bosch GmbH, Germany*, ²*Fachgebiet für trennende und fügende Fertigungsverfahren (tff), University of Kassel, Germany*

11:50 Fr4-H8 A120426

Development of laser cladding for TNGA engine, Kohei Yanaka¹, Shingo Iwatani², Natsuki Sugiyama², Hironori Aoyama², ¹*Toyota Motor Corporation, Raw Material Development Division No.2, Japan*, ²*Toyota Motor Corporation, Production Engineering Development Division, Japan*

12:10 Lunch Time

Session 37. Hall "Himawari"
LPM: SP3-3 "Laser processing of glass materials: current status, trends and future"

Chair: Tetsuo Kishi, Tokyo Institute of Technology, Japan

13:30 FrM-L1 **Invited** A122864

New insights to femtosecond laser induced ion migrations in multicomponent glass waveguides, Toney T. Fernandez¹, S. Gross¹, T. Gretzinger¹, A. Arriola¹, M. Withford¹, ¹*MQ Photonics Research Centre, Department of Physics and Astronomy, Macquarie University, Australia*

14:00 FrM-L2 A120169

Laser-induced generation of color centers in borosilicate glass as a way to control its chemical reactivity, Anton Serkov¹, Howard Snelling¹, ¹*University of Hull, United Kingdom*

14:20 FrM-L3 A120292

Direct laser writing of large scale photonic crystal spatial filters in glass using Bessel beams, Vytautas Purlys^{1,2}, Darius Gailevičius^{1,2}, Kestutis Staliunas^{3,4}, ¹*Femtika LTD, Lithuania*, ²*Vilnius University Laser Research Center, Lithuania*, ³*Departament de Física i Enginyeria Nuclear, Universitat Politècnica de Catalunya, Spain*, ⁴*Institucio Catalana de Reserca i Estudis Avançats (ICREA), Spain*

14:40 FrM-L4 **Student** A120207

Fabrication of molybdenum carbide nanoparticles by femtosecond laser ablation in Hexane, Yoshiki Tanaka¹, Shusaku Terakawa¹, Xi Yu¹, Toru Asaka¹, Michiharu Ota², Fumihiro Itoigawa¹, Shingo Ono¹, ¹*Nagoya Institute of Technology, Japan*, ²*IMRA America, Inc., Japan*

15:00 Coffee Break

Session 40. Room 2
LPM: Medical and biological applications 2

Chair: Yasutaka Hanada, Hirosaki University, Japan

13:30 Fr2-L9 A120951

Three dimensional scaffolds made of electrospun polymers, Marco Götze¹, Tobias Kürbitz^{2,3}, Christian E., H. Schmelzer³, Andreas Heilmann^{2,3}, Georg Hillrichs¹, ¹*University of Applied Sciences Merseburg, Germany*, ²*University of Applied Sciences Anhalt, Germany*, ³*Fraunhofer Institute for Microstructure of Materials and Systems IMWS, Germany*

13:50 Fr2-L10 A120291

Modified channel structures activated on-chip high-speed manipulation of micro-objects by femtosecond laser impulse, Yaxiaer Yalikun¹, Zhen-Yi Hong¹, Kazunori Okano¹, Takanori Iino², Yoichiroh Hosokawa¹, ¹*Graduate School of Materials Science, Nara Institute of Science and Technology, Japan*, ²*Department of Electrical Engineering and Information Systems, The University of Tokyo, Japan*

14:10 Fr2-L11 A120305

Femtosecond laser processed 4 μm thick glass filter for cell culturing, Yaxiaer Yalikun¹, Yoichiroh Hosokawa¹, ¹*Graduate School of Materials Science, Nara Institute of Science and Technology, Japan*

14:30 Coffee Break

Session 43. Room 3
LPM: Surface treatment 4

Chair: Hai Xiao, Clemson University, USA

13:30 Fr3-L9 **Invited** A122546

Direct laser writing and direct laser interference patterning for surface modification in automotive, photovoltaic and life sciences", Udo Klotzbach¹, Volker Franke¹, Tim Kunze¹, Frank Sonntag¹, Andres Lasagni^{1, 2}, Christoph Leyens^{1, 2}, ¹Fraunhofer IWS, Dresden, Germany, ²Technische Universität Dresden, Germany

14:00 Fr3-L10 A120340

New possibilities for direct laser interference patterning: Hierarchical, complex and non-symmetric textures for surface functionalization, Andrés Fabián Lasagni^{1,2}, Bogdan Voisiat¹, Tim Kunze², Sabri Alamri², Christoph Zwahr^{1,2}, Mikhael El-Khoury¹, Florian Rökler¹, ¹Institut für Fertigungstechnik, Technische Universität Dresden, Germany, ²Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS, Germany

14:20 Fr3-L11 A120314

Laser-silanization nanostructuring process for superwicking metal surfaces, Avik Samanta¹, Qinghua Wang¹, Scott Shaw², Farima Toor³, Hongtao Ding¹, ¹Department of Mechanical Engineering, University of Iowa, USA, ²Department of Chemistry, University of Iowa, USA, ³Department of Electrical & Computer Engineering, University of Iowa, USA

14:40 Fr3-L12 A120193

Picosecond laser fabrication of the riblet-array surface texture on Ti64 alloy substrate, Xincal Wang¹, Yin Chi Wan¹, ¹Singapore Institute of Manufacturing Technology, A*STAR, Singapore

15:00 Coffee Break

Session 46. Room 4
HPL 12: Additive Manufacturing 4

Chair: Christoph Leyens, Director, Fraunhofer Institute for Material and Beam Technology IWS, Germany

13:30 Fr4-H9 **Invited** A121892

Metallic additive manufacturing: Past present and future, Jyoti Mazumder¹, ¹University of Michigan, USA

14:00 Fr4-H10 Cancelled A122093

14:20 Fr4-H11 **Student** A120063

Selective laser melting printed NdFeB permanent magnet, Kai-Sheng Yu¹, Chung-Wei Cheng², Wen-Cheng Chang³, An-Chen Lee⁴, Mi-Ching Tsai⁵, ¹Department of Mechanical Engineering, National Chiao Tung University, Taiwan, ²Department of Mechanical Engineering, National Chiao Tung University, Taiwan, ³Department of Physics, National Chung Cheng University, Taiwan, ⁴Department of Mechanical Engineering, National Chiao Tung University, Taiwan, ⁵Department of Mechanical Engineering, National Cheng Kung University, Taiwan

14:40 Fr4-H12 **Student** A120297

Effect of laser shock peening on corrosion properties of laser additive manufactured IN718 superalloy, Sagar Sarkar¹, Harikrishnan R², Muvvala Gopinath¹, Ashish Kumar Nath¹, ¹Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, West Bengal, India, ²Advanced Technology Development Centre, Indian Institute of Technology, Kharagpur, West Bengal, India, ³Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, West Bengal, India, ⁴Department of Mechanical Engineering, Indian Institute of Technology, Kharagpur, West Bengal, India

15:00 Coffee Break

Session 47.**Hall "Himawari"****Joint Session (LPM+HPL)**

Chair: Takashi Ishide, Mitsubishi Heavy Industries Ltd., Japan; JLPS
President

15:30 FrM-J5 **Invited** A121317

High throughput femtosecond machining, Clemens Hönninger¹, Julien Pouysegur¹, Benoit Tropheme¹, Florent Basin¹, Martin Delaigue¹, Konstantin Mishchik¹, Eric Audouard¹, Eric Mottay¹, ¹*Amplitude Laser Group, France*

16:00 FrM-J6 **Invited** A122800

Recent developments in laser micro and macro processing, Christoph Leyens^{1,2}, Andreas Wetzig¹, Jens Standfuß¹, Udo Klotzbach¹, Frank Brückner^{1,3}, ¹*Fraunhofer IWS, Dresden, Germany*, ²*Technische Universität Dresden, Institute of Materials Science, Dresden, Germany*, ³*Luleå University of Technology, Luleå, Sweden*

16:30 FrM-J7 **Plenary** A122501

Synthetic optical holography, Paul Scott Carney¹, ¹*University of Rochester, United States*

Hall "Himawari"**Closing**

Chair: Hiroyuki Niino, AIST, Japan

17:00 Outstanding Awards

Closing Remark

17:30 close

Poster Session

May 22, 10:30- Short Presentation for LPM Poster Session I & II (Room 1)

May 22, 11:20- Short Presentation for HPL Poster Session (Room 4)

May 22, 12:10 Poster Session I and Exhibition

May 23, 12:10 Poster Session II and Exhibition

The authors should be present in front of their posters during 12:10-13:50 on May 22 and May 23.

LPM

P-LPM1 A120265

Time-resolved imaging of laser induced cavitation bubble (LICB) dynamics by pulsed laser ablation in liquid phase, Hyeon Jin Jung¹, Seung Jun Lee¹, Seung Min Park², Myong Yong Choi¹, ¹*Department of Chemistry, Gyeongsang National University, South Korea*, ²*Department of Chemistry, Kyung Hee University, South Korea*

P-LPM2 A120828

Dissociation of water under plasma of laser breakdown on nanoparticles, Ilya Baymler^{1, 2}, Sergey Gudkov², Ekaterina Barmina², Alexander Simakin², Georgiy Shafeev^{2, 3}, ¹*Moscow Institute of Physics and Technology, Russia*, ²*Prokhorov General Physics Institute of the Russian Academy of Sciences, Moscow, Russia*, ³*National Research Nuclear University MEPhI (Moscow Engineering Physics Institute), Russia*

P-LPM3 A122487

Laser ablation of liquids induced Se colloids: Phase transition and in-situ Raman monitoring, Jun Liu¹, ¹*Institute of Solid State Physics, CAS, China*

P-LPM4 A120779

Formation of elongated nanoparticles by laser ablation of gold target in aqueous solutions containing divalent ions, Margarita Zhilnikova^{1,2}, Kuder Ayyyzhy^{1,2}, Ekaterina Barmina², Georgy Shafeev^{2,3}, Oleg Urarov, ¹*The Federal State Educational Institution of Higher Professional Education, Moscow Institute of Physics and Technology (State University), Wave Research Center of Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia*, ²*Wave Research Center of Prokhorov General Physics Institute of the Russian Academy of Sciences, Russia*, ³*National Research Nuclear University MEPhI, Russia*

P-LPM5 A120356

Femtosecond laser induced chiroptical properties in silica studied by transmission mueller-matrix spectroscopic ellipsometry, Jing Tian¹, Rubing Li², Enric Garcia-Caurel³, Razvigor Ossikovski³, Michel Stchakovsky⁴, Celine Eypert⁴, Bertrand Poumellec¹, Matthieu Lancry¹, ¹*Institut de Chimie Moléculaire et des Matériaux d'Orsay, UMR CNRS-UPS 8182, Université Paris Sud, Orsay, France*, ²*Institute of Circular Economy, Beijing University of Technology, P. R. China*, ³*Laboratoire de physique des interfaces et des couches minces, CNRS, Ecole Polytechnique, Palaiseau, France*, ⁴*HORIBA Europe Research Center, Palaiseau, France*

P-LPM6 **Student** A120262

3D microfabrication of transparent thermoset polymer PDMS using laser-induced bubbles, Yuhei Miyahara¹, Yasutaka Hanada¹, ¹*Graduate school of Science and Technology, Hirosaki univ, Japan*, ²*Graduate school of Science and Technology, Hirosaki univ, Japan*

P-LPM7 A120321

Study on condition monitoring for IoT in laser welding process, Masashi Oikawa¹, Naoki Kawada², ¹*Engineering and Technical Research Department, Japan Transport Engineering, Japan*, ²*Engineering Department, Saitama Institute of Technology, Japan*

P-LPM8 **Student** A120964

High-speed observation of sputtered Si droplets produced by optical vortex pulse, Hiroki Oshima¹, Yuichiro Wakiyama¹, Miki Kawamoto¹, Mitsuhiro Higashihata¹, Hiroshi Ikenoue¹, Daisuke Nakamura¹, ¹*Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan*

- P-LPM9 A121243
In-process measurement of processed hole depth under femtosecond laser processing using optical coherence tomography with swept light source, Satoshi Hasegawa¹, Masatoshi Fujimoto², Yoshio Hayasaki¹, ¹*Center for Optical Research and Education (CORE), Utsunomiya University, Japan*, ²*Hamamatsu Photonics K.K., 5000 Hirakuchi, Hamakita-ku, Hamamatsu, Japan*
- P-LPM10 A120310
Optical properties of polymer-based nanocomposites with metal nanoparticles, Ignat Rakov¹, Ekaterina Barmina¹, ¹*Wave Research Center of Prokhorov General Physics Institute of the Russian Academy of Sciences, Russian Federation*
- P-LPM11 *Student* A120249
Cu micropatterning on step structures using femtosecond laser reduction of glyoxylic acid copper complex, Ha Phuong Nam¹, Atsushi Tanokuchi¹, Akira Uetsuki², Tomoji Ohishi², Mizue Mizoshiri¹, ¹*Nagaoka University of Technology, Japan*, ²*Shibaura Institute of Technology, Japan*
- P-LPM12 A120889
Femtosecond laser 3D nanoprinting enables manufacturing of smart micro-machines, Zhuo-Chen Ma¹, ¹*Tsinghua University, China*
- P-LPM13 A120074
Tilted microstructure induced by spatiotemporally focused femtosecond laser pulses, Ye Dai¹, Qin Li¹, ¹*Department of Physics, Shanghai University*
- P-LPM14 A120253
Delay time effect on surface processing by double pulse irradiation of t:sapphire laser., Masahito Katto^{1,2}, Masanori Kaku², Masahiro Tsukamoto³, Atsushi Yokotani², ¹*CRCC, University of Miyazaki*, ²*Grad. School of Engineering, University of Miyazaki*, ³*JWRI, Osaka University*
- P-LPM15 *Student* A120731
Femtosecond laser dimpling on SUS substrate for improving tribological properties, Xi Yu¹, Hiroyuki Kawai¹, Fumihiro Itoigawa¹, Shingo Ono¹, Nobuhito Takizawa², Kazuhisa Mikame², ¹*Nagoya Institute of Technology, Japan*, ²*Tamari Industry Co., LTD., Japan*
- P-LPM16 A120907
Detection of l-cysteine by use of an optical fiber spectroscopic cell fabricated by femtosecond laser drilling, Masahiko Shiraiishi¹, Kazuhiro Watanabe², Shoichi Kubodera², ¹*Department of Information Systems Science, Faculty of Science and Engineering, Soka University, 1-236, Tangi-machi, Hachioji, Tokyo, 192-8577, Japan*, ²*Department of Science and Engineering for Sustainable Innovation, Faculty of Science and Engineering, Soka University, 1-236, Tangi-machi, Hachioji, Tokyo, 192-8577, Japan*
- P-LPM17 *Student* A120210
Centrosymmetric cladding-waveguide-arrays directly written by femtosecond laser in LiNbO₃ crystals, Bin Zhang¹, Lingqi Li¹, Ziqi Li¹, Bingcheng Xiong¹, Yuying Zhang¹, Jiaming Wu¹, Lei Wang¹, Feng Chen¹, ¹*School of Physics, State Key Laboratory of Crystal Materials, Shandong University, Jinan 250100, China*
- P-LPM18 A120242
Photoinduced crystal growth in Al₂O₃-Y₂O₃ glass fabricated by gas floating laser melting method, Yasuhiko Shimotsu¹, Kotaro Tomura¹, Masahiro Shimizu¹, Kiyotaka Miura¹, ¹*Kyoto University, Japan*
- P-LPM19 A120164
Bending strength and cyclic fatigue tests of yttria-stabilized zirconia ceramics modified with femtosecond-laser induced periodic surface structures for medical implants, Masayuki Kakehata¹, Ayako Oyane², Hidehiko Yashiro¹, Atuo Ito³, Yoshimitsu Okazaki³, Kenji Torizuka¹, ¹*ESPRIT, AIST, Japan*, ²*NMRI, AIST, Japan*, ³*HRI, AIST, Japan*
- P-LPM20 A120107
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