

The 14th International Symposium on Laser Precision Microfabrication (LPM2013)

The 6th International Symposium on High Power Laser Processing (HPL2013)

The 6th International Congress on Laser Advanced Materials Processing

# LAMP2013

July 23–26, 2013

Toki Messe, Niigata, Japan

<http://www.jlps.gr.jp/lamp/lamp2013/>

## *Program and Technical Digest*

*published July 22, 2013*  
*updated July 30, 2013*

<i>General Chair</i>	Koji Sugioka	<i>RIKEN, Japan</i>
<i>Co-Chair/LPM Program Committee Chair</i>	Hiroyuki Niino	<i>AIST, Japan</i>
<i>Co-Chair/HPL Program Committee Chair</i>	Seiji Katayama	<i>Osaka University, Japan</i>
<i>Co-Chair</i>	Kazuyoshi Itoh	<i>Osaka University, Japan</i>
<i>Co-Chair</i>	Yongfeng Lu	<i>University of Nebraska-Lincoln, USA</i>
<i>Co-Chair</i>	Michael Schmidt	<i>Friedrich-Alexander Universität Erlangen-Nürnberg, Germany</i>
<i>Honorary Chair</i>	Isamu Miyamoto	<i>Osaka University, Japan</i>
<i>Steering Committee Chair</i>	Yoshiro Ito	<i>Nagaoka University of Technology, Japan</i>

# Contents

Aim and Scope	1
Committees	2
LPM Special Sessions	5
LPM-HPL Joint Session	6
Plenary Talks	7
Invited Speakers	7
Program	11
Author Index	41

## Aim and Scope

---

### **Welcome to join us at LAMP2013!**

The International Congress on Laser Advanced Materials Processing (LAMP) deals with science and technology of advanced laser materials processing covering precision microfabrication and high power laser processing. Basically LAMP is held every four years, and the former LAMPs have won the good reputation and popularity as the one of the most excellent international meetings in the world. LAMP2013 is held during July 23-26, 2013, in TOKI MESSE, Niigata, Japan. LAMP2013 consists of International Symposia on Laser Precision Microfabrication (LPM) and High Power Laser Processing (HPL) and covers hardware as well as software for fundamental research and industrial applications in both micro and macro processing. LAMP2013 is planned as a four day event with a plenary session, oral and poster sessions, special sessions dealing with topical issues, and the exhibition with inviting most important world authorities in this field. The aim of this congress is to provide a forum for discussion of fundamental aspects of laser-matter interaction, the state-of-the-art of laser materials processing, and topics for the next generation with fundamental scientists, end users and laser manufactures. We expect that LAMP2013 would play an important role not only for understanding fundamental knowledge of laser materials processing but also forecasting future technologies to be developed and the future laser market.

Dr. Koji Sugioka, General Chair, LAMP2013

## Committees

---

### *General Chair*

Koji Sugioka *RIKEN, Japan*

### *Co-Chair*

Hiroyuki Niino *AIST, Japan*

Seiji Katayama *Osaka University, Japan*

Kazuyoshi Itoh *Osaka University, Japan*

Yongfeng Lu *University of Nebraska-Lincoln, USA*

Michael Schmidt *Friedrich-Alexander Universität Erlangen-Nürnberg, Germany*

### *Honorary Chair*

Isamu Miyamoto *Osaka University, Japan*

### *Organizer*

Japan Laser Processing Society (JLPS) Japan

## International Advisory Committee

---

### *Chairperson*

Koji Sugioka *RIKEN, Japan*

### *Members*

Alan Arai *IMRA America, Inc., USA*

Ralf Echhard Beyer *Fraunhofer IWS, Germany*

Chung-Wei Cheng *Industrial Technology Research Institute, Taiwan*

Remy Fabbro *CLFA-Cooperation Laser Franco-Allemande, France*

Burkhard Fechner *Coherent GmbH, Germany*

Costas Fotakis *F.O.R.T.H.–Foundation for Research and Technology-Hellas, Greece*

Kenshi Fukumitsu *Hamamatsu Photonics K.K., Japan*

Costas *University of California Berkeley, USA*

Grigoropoulos

Takashi Ishide *Mitsubishi Heavy Industries, Ltd., Japan*

Takahisa Jitsuno *Osaka University, Japan*

Teruyoshi Kadoya *L.T.F.–Laser Technology Foundation, Japan*

Jeong-Han Kim *KITECH-Korea Institute of Industrial Technology, South Korea*

Akikazu Kitagawa *Hitachi Zosen Corporation, Japan*

Vitali Konov *GPI-General Physics Institute, Russia*

Dietmar Kracht *LZH–Laser Zentrum Hannover, Germany*

Masao Kubo *Panasonic Electric Works, Ltd ., Japan)*

Sylvain Lazare *Université de Bordeaux 1, France*

Jyoti Mazumder *The University of Michigan, USA*

Kiyokazu Mori *NISSAN, Japan*

Sumio Nakahara *Kansai University, Japan*

Hitoshi Nishimura *Panasonic Welding Systems Co ., Ltd ., Japan*

Tatsuo Okada *Kyushu University, Japan*

Moriaki Ono *JFE Techno-Research Corporation, Japan*

Rajesh S. Patel *Spectra Physics, USA*

Reinhart Poprawe *Fraunhofer ILT, Germany*

Stan Ream *EWI, USA*

Shozui Takeno *Mitsubishi Electric Corporation, Japan*

Frank Vollertsen *BIAS–Bremer Institut fuer angewandte Strahltechnik, Germany*

Ken Watkins *University of Liverpool, UK*

Xianfan Xu *Purdue University, USA*

Kozo Yasuda *Konan University, Japan*

## LPM2013 Program Committee

---

### Chair

Hiroyuki Niino *AIST – National Institute of Advanced Industrial Science and Technology, Japan*

### Members

Craig B. Arnold *Princeton University, USA*  
 Ya Cheng *Shanghai Institute of Optics and Fine Mechanics, CAS, China*  
 Sung-Hak Cho *Korea Institute of Machinery & Materials, South Korea*  
 Friedrich H. Dausinger *University of Stuttgart, Institut für Strahlwerkzeuge, IFSW, Germany*  
 Jan J. Dubowski *Université de Sherbrooke, Canada*  
 Arnold Gillner *Fraunhofer ILT, Germany*  
 Henry Helvajian *The Aerospace Corporation, USA*  
 Guido Hennig *Daetwyler Graphics AG, Switzerland*  
 Peter R. Herman *University of Toronto, Canada*  
 Minghui Hong *Data Storage Institute, Singapore*  
 Jürgen Ihlemann *Laser-Laboratorium Göttingen e.V., Germany*  
 Yoshiro Ito *Nagaoka University of Technology, Japan*  
 Saulius Juodkazis *Swinburne University of Technology, Australia*  
 Tetsuya Makimura *University of Tsukuba, Japan*  
 Shoji Maruo *Yokohama National University, Japan*  
 Scott A. Mathews *The Catholic University of America, USA*  
 Michel Meunier *École Polytechnique de Montréal, Canada*  
 Yoshiki Nakata *Osaka University, Japan*  
 Etsuji Ohmura *Osaka University, Japan*  
 Yasuhiro Okamoto *Okayama University, Japan*  
 Masayuki Okoshi *National Defense Academy, Japan*  
 Toshihiko Ooie *METI, AIST, Japan*  
 Andreas Ostendorf *Ruhr-University Bochum, Germany*  
 Alberto Piqué *Naval Research Laboratory, USA*  
 Jürgen Reif *Brandenburg University of Technology, Germany*  
 Pere Serra *Universitat de Barcelona, Spain*  
 Javier Solis *Instituto de Optica, Spain*  
 Jürgen Stampfl *TU Wien (University of Vienna), Austria*  
 Razvan Stoian *Université Jean Monnet, France*  
 Stelios Tzortzakos *F.O.R.T.H.–Foundation for Research and Technology-Hellas, Greece*  
 Vadim P. Veiko *St. Petersburg State University of Information Technologies, Russia*  
 Bert Huis in 't Veld *University of Twente, The Netherlands*  
 Kunihiko Washio *Paradigm Laser Research Ltd., Japan*  
 Wataru Watanabe *Ritsumeikan University, Japan*

## HPL2013 Program Committee

---

### Chair

Seiji Katayama *Osaka University, JWRI, Japan*

### Members

Akio Hirose *Osaka University, Japan*  
 Berndt Brenner *Fraunhofer Institute Material and Beam Technology, Germany*  
 Francis Briand *AIR LIQUIDE / CTAS, France*  
 Alexander Kaplan *Lulea University of Technology, Sweden*  
 Aravinda Kar *University of Central Florida, USA*  
 Jong Do Kim *Korea Maritime University, South Korea*  
 Veli P. Kujanpaa *VTT Technical Research Centre of Finland, Finland*  
 Muneharu Kutsuna *ALTREC Co., Ltd., Japan*  
 Kazuhisa Mikame *Maeda Industry Co.,Ltd., Japan*  
 Wang Jingbo *Panasonic Welding Systems Co., Ltd., Japan*  
 Yixiong Wu *Shanghai Jiaotong University, China*  
 Hiroto Yamaoka *IHI Corporation, Japan*  
 Masanori Yasuyama *Sumitomo Metal Industries, Ltd., Japan*

## Steering Committee

---

### *Chair*

Yoshiro Ito *Nagaoka University of Technology, Japan*

### *Members*

Yasutaka Hanada *Hirosaki University, Japan*  
 Yoshio Hayasaki *Utsunomiya University, Japan*  
 Hitoshi Hiraga *Tsubame Sanjo Regional Industries Promotion Center, Japan*  
 Yoichiro Hosokawa *Nara Institute of Science and Technology, Japan*  
 Masahito Katto *University of Miyazaki, Japan*  
 Yousuke Kawahito *Osaka University, Japan*  
 Tetsuya Makimura *University of Tsukuba, Japan*  
 Shigeki Matsuo *The University of Tokushima, Japan*  
 Yukio Miyashita *Nagaoka University of Technology, Japan*  
 Masami Mizutani *Osaka University, Japan*  
 Yasuaki Naito *Nippon Steel & Sumitomo Metal Corporation, Japan*  
 Susumu Nakamura *Nagaoka College of Technology, Japan*  
 Yoshiki Nakata *Osaka University, Japan*  
 Aiko Narazaki *AIST, Japan*  
 Hiroaki Nishiyama *Yamagata University, Japan*  
 Etsuji Ohmura *Osaka University, Japan*  
 Yasuhiro Okamoto *Okayama University, Japan*  
 Masayuki Okoshi *National Defense Academy, Japan*  
 Toshihiko Ooie *AIST, Japan*  
 Yasuyuki Ozeki *Osaka University, Japan*  
 Rie Tanabe *Nagaoka University of Technology, Japan*  
 Motomichi Yamamoto *Hiroshima University, Japan*  
 Yosuke Yamazaki *Osaka University, Japan*

## LPM Special Sessions

---

### SP L1: Laser Nanofabrication

---

Session Organizer : Hong Minghui (National University of Singapore)  
 Co-organizer : Craig B. Arnold (Princeton University, USA)

The Laser as a versatile tool has been finding extensive applications in advanced manufacturing and will continue to play a major role in the push toward fabrication of nanoscale structures due to its unique ability to produce non-contact, light based processing in air over a large area at a fast speed. To showcase recent research progress on laser nanofabrication, this session covers the research topics related to nanostructures fabrication, including new processing design, light interactions with materials at the nanoscale, laser surface nano-patterning and nano-materials synthesis by laser ablation and laser induced chemical reactions.

### SP L2: High Speed Imaging and Time Resolved Measurements in Laser Processing

---

Session Organizer : Scott A. Mathews (The Catholic University of America, USA)

The past decade has seen tremendous growth in the number of laser processing techniques being used in both research and industrial production. In addition to entirely new laser processes, the field has seen an expansion in the number of different materials being processed and dramatic advances in laser performance. As a result of this growth, many new processes are not fully understood. In order to fully characterize these processes, many researchers have employed high speed imaging and time resolved measurements to study laser-matter interactions in real time. In many cases, these in situ measurements have revealed important and unexpected information about the physics of the processes. This special session is designed to promote the exchange of ideas and results in the area of high speed imaging and time resolved measurements with the goal of creating a better understanding of the physical mechanisms associated with these novel and ever-expanding laser processes.

List of Sub-Topics (SP L2)

- High Speed and Ultra High Speed Video
- Shadography
- Pump-Probe Imaging
- Imaging of Ultra Fast Laser-Matter Interactions
- In Situ Spectroscopy, Laser Induced Breakdown Spectroscopy
- Time Resolved Holography
- Plasma Dynamics during Laser Processing

### SP L3: Ultrashort Pulsed Laser Processing toward Industrial Application

---

Session Organizer : Yasuhiro Okamoto (Okayama University, Japan)

Ultrashort pulsed laser has been widely used and its nonlinear process has been attracting the interests for industrial applications. In order to realize industrial applications by ultrashort pulsed laser, not only process understanding but also related technology has been investigated and developed. This session covers research topics of ultrashort pulsed laser processing and related technologies towards industrial applications.

## LPM-HPL Joint Session

---

### Tailored Surfaces by Laser Additive Manufacturing (LAM)

---

Session Organizer : Paul Denney Lincoln Electric, USA  
Co-organizer : Kunihiko Washio Paradigm Laser Research Ltd., Japan

Laser Additive Manufacturing (LAM) has recently been described as “the next industrial revolution” and has been the focus of researchers, governments, corporations, and the media. Most of the interest has been focused on the “digital manufacturing” part of this technology where lasers are used to fuse materials into three dimensional models or function components with applications including consumer products, aerospace, medical, automotive, and more. While LAM has been touted as a recent development it actually dates back to 1980’s when lasers were first used to alter the surfaces of materials to improve wear and corrosion properties of materials or for simple repairs damaged/worn components. Recently in parallel to the precision digital manufacturing aspect of LAM, there has been major improvements and implementation of laser “surface tailoring” for heavy manufacturing, mining, power generation, oil and gas, and agriculture. These applications as before include the addition of layers for wear and corrosion protection or to selectively add material with low heat input for repairing high value components.

These new applications have been justified by material cost reduction, life extension, processing rate, and/or performance improvement but ultimately all of these actually are reduction of the lifecycle costs. Some of this has been made possible/practical due to advances in lasers and optics and/or new processing techniques. This session will focus on past and present applications of this area of LAM and some of the new developments in this area.

Some of the topics will include:

- Advantages of LAM over tradition arc based processes
- Implementation of LAM into industrial applications
- Innovations in LAM and “surface tailoring”
- Use of advanced laser technologies for LAM applications
- Performance of LAM materials
- Potential future applications for LAM
- New materials for LAM applications



## Plenary Talks

---

**Paul Denney** *Lincoln Electric, USA*

“Laser Additive Manufacturing (LAM) for Tomorrow’s Economy”

**Katsumi Midorikawa** *RIKEN, Japan*

“Progress of XUV science by high-order harmonic generation”

**Dirk Petring** *Fraunhofer Institute for Laser Technology ILT, Germany*

“Mission possible: the next generation of multi-kW laser materials processing”

## Invited Speakers

---

### LPM

---

**Eric Pei-Yu Chiou** *University of California at Los Angeles, USA*

“Photothermal nanoblade for cell surgery and large cargo delivery”

**Feng Chen** *Shandong University, China*

“Femtosecond laser micromachined dielectric crystals for photonic applications”

**Maria Farsari** *IESL-FORTH, Greece*

“Beyond the diffraction limit: Laser fabrication of 3D nanostructures”

**Nils Hartmann** *Universitat Duisburg-Essen, Germany*

“Laser processing of ultrathin organic coatings: Prospects in nanoscale patterning, functionalization and manipulation”

**Masahito Katto** *University of Miyazaki, Japan*

“Development of ultrashort pulsed VUV laser and its applications”

**Takanobu Kisu** *Kyushu University, Japan*

“Recent advancement in Laser processing of long-length high-performance RE-123 superconducting wires”

**Thomas Lippert** *Paul Scherrer Institut, Switzerland*

“Laser-induced forward transfer (LIFT) of functional materials”

**Michel Meunier** *Ecole Polytechnique de Montreal, Canada*

“Plasmonic enhanced pulsed laser nanoprocessing and cell nanosurgery”

**Michael J. Withford** *Macquarie University, Australia*

“Integrated optics and photonic devices: femtosecond laser direct write technique and laser written waveguides”

**Patrick Salter** *University of Oxford, UK*

“Dynamic optics for three-dimensional laser processing”

**Kentaro Tatsukoshi** *Asahi Glass Co., Ltd., Japan*

“Through glass via (TGV) formation technology for 3D integrated packaging”

**Ludger Overmeyer** *LZH, Germany*

“Polymer based planar optronic systems”

## LPM SP L1: Laser Nanofabrication

---

**Din Ping Tsai** *National Taiwan University / Research Center for Applied Sciences, Taiwan*

“Laser fabrication of plasmonic nanostructures for 3D light manipulation, sensing, and energy”

**Naoto Koshizaki** *National Institute of Advanced Industrial Science and Technology, Japan*

“Fabrication and application of submicron spherical particles prepared by pulsed laser melting in liquid”

## LPM SP L2: High Speed Imaging and Time Resolved Measurements in Laser Processing

---

**Pere Serra** *Universitat de Barcelona, Spain*

“Time-resolved imaging of liquid ejection during laser printing”

**Valdas Sirutkaitis** *Vilnius University, Lithuania*

“Time-resolved digital holography in the investigation of ablation and micro fabrication by femtosecond pulses”

**Ludger Overmeyer** *Laser Zentrum Hannover e. V., Germany*

“Time-resolved studies of laser-assisted bioprinting”

## LPM SP L3: Ultrashort Pulsed Laser Processing toward Industrial Application

---

**Manabu Shiozawa** *HITACHI Ltd., Japan*

“Simultaneous multi-bit recording and driveless reading for permanent storage in fused silica”

**Arnold Gillner** *Fraunhofer-Institut for Laser Technology, Germany*

“Prospects and requirements for industrialisation of ultrashort pulse laser technology”

**Bastian Becker** *TRUMPF Corporation, Japan*

“Latest ultra short pulsed laser technology for new materials, applications and industries”

## HPL

---

**Thomas Seefeld** *Bremer Institut fuer angewandte Strahltechnik GmbH*

“New developments in filler wire assisted laser joining of aluminum”

**Kogel Hollacher Markus** *Precitec KG, Germany*

“Latest approaches in process monitoring for high power processing on hybrid welding”

**Kenji Shinozaki** *Hiroshima University, Japan*

“Solidification cracking susceptibility of modified 9Cr-1Mo steel weld metal during hot wire laser welding with narrow gap groove”

**Muneharu Kutsuna** *Advanced Laser Technology Research Center Co., Ltd., Japan*

“Study on mosaic joint of CFRP composite using a Q-switch YAG laser”

**Steffen Bonss** *Fraunhofer IWS Dresden, Germany*

“Laser heat treatment technologies for wear protection of steam turbine blades”

**Kim Young Sik** *Korea Institute of Science and Technology Information, Korea*

“Recent technological tendency of laser/arc hybrid welding”

## LPM-HPL Joint Session: Tailored Surfaces by Laser Additive Manufacturing (LAM)

---

**Minlin Zhong** *Tsinghua University, China*

“Laser cladding in China: from fundamental research to industrial applications”

**Eckhard Beyer** *Fraunhofer IWS, German*

“High-rate laser deposition”

**Jeff Franks** *Laserline KK, Japan*

“Cladding & heat treatment with high power, fibre-coupled, diode lasers”

**Marco Goebel** *ILT Fraunhofer, Germany*

“Repair of compressor airfoils by laser metal deposition and process monitoring with a CPC-system”

## LPM-HPL Joint Session: Advanced Laser Processing

---

**Alexander F. H. Kaplan** *Luleå University of Technology, Sweden*

“Angle- and absorptivity-modulation at inclined wavy processing fronts”

**Xinbing Liu** *Panasonic Boston Lab., USA*

“Parallel drilling using ps lasers for production applications”

**Steven M. Yalisove** *Michigan University, USA*

“Interface driven response to 150 femtosecond irradiation of very thin films: Thresholds, nanoparticles, and a little bit of shock”



# *Program*



# Oral Session

Day 1: July 23

**Day 1: Tuesday, July 23****Room 1****Opening***9:50* Opening Remark**Room 1****Plenary Session**

Chair: Seiji Katayama

*10:00* Tu1-PL-1 **Plenary****Progress of XUV science by high-order harmonic generation**, Katsumi Midorikawa<sup>1</sup>, <sup>1</sup>*RIKEN, Japan**10:40* Tu1-PL-2 **Plenary****Laser additive manufacturing (LAM) for tomorrow's economy**, Paul Denney<sup>1</sup>, <sup>1</sup>*Lincoln Electric, USA**11:20* Tu1-PL-3 **Plenary****Mission possible: The next generation of multi-kW laser materials processing**, Dirk Petring<sup>1</sup>, <sup>1</sup>*Fraunhofer-Institute for Laser Technology ILT, Germany**12:00* Lunch Time

1. LPM

Room 1

Patterning I

Chair: Yoshiki Nakata

14:00 Tu1-0L-4

**Effect of laser irradiation on ZnO nanocrystal growth by nanoparticle-assisted pulsed laser deposition**, Daisuke Nakamura<sup>1</sup>, Tetsuya Shimogaki<sup>1</sup>, Yuki Muraoka<sup>1</sup>, Shihomi Nakao<sup>1</sup>, Kousuke Harada<sup>1</sup>, Mitsuhiro Higashihata<sup>1</sup>, Yoshiki Nakata<sup>2</sup>, Hiroshi Ikenoue<sup>1</sup>, Tatsuo Okada<sup>1</sup>, <sup>1</sup>*Kyushu University, Japan*, <sup>2</sup>*Osaka University, Japan*

14:20 Tu1-0L-5

**Fast parallel micromachining using the spatial light modulator and the galvanometer scanner with infrared nanosecond fiber laser**, Jarno J.J. Kaakkunen<sup>1</sup>, Ilkka Vanttaja<sup>1</sup>, Petri Laakso<sup>1</sup>, <sup>1</sup>*VTT Technical Research Centre of Finland, Finland*

14:40 Tu1-0L-6

**Fabrication of hierarchical structures by direct laser writing and multi-beam-interference**, Michael Steger<sup>1</sup>, Claudia Hartmann<sup>2</sup>, Stefan Beckemper<sup>2</sup>, Jens Holtkamp<sup>2</sup>, Arnold Gillner<sup>2</sup>, <sup>1</sup>*Fraunhofer Institute for Lasertechnology, Germany*, <sup>2</sup>*Chair for Laser Technology, Technical University Aachen, Germany*

15:00 Tu1-0L-7 Student

**Band-gap emission and second harmonic generation in ZnSe 2D periodic nanostructures fabricated by the interference of three femtosecond laser beams**, Jia Pan<sup>1</sup>, Tianqing Jia<sup>2</sup>, <sup>1</sup>*State Key Laboratory of Precision Spectroscopy, East China Normal University, People Republic of China*, <sup>2</sup>*State Key Laboratory of Precision Spectroscopy, East China Normal University, People Republic of China*

15:20 Tu1-0L-8

**Laser direct synthesis of 60 nm silicon nanowires**, Xianfan Xu<sup>1</sup>, <sup>1</sup>*Purdue University, USA*

15:40 Coffee Break

3. LPM SP2-1

Room 2

High Speed Imaging and Time Resolved Measurements I

Chair: Valdas Sirutkaitis

14:00 Tu2-IL-1 **Invited**

**Time-resolved imaging of liquid ejection during laser printing**, Adrian Patrascioiu<sup>1</sup>, Juan Marcos Fernández-Pradas<sup>1</sup>, José Luis Morenza<sup>1</sup>, Pere Serra<sup>1</sup>, <sup>1</sup>*Universitat de Barcelona, Dept. Física Aplicada i Optica, Spain*

14:30 Tu2-0L-2

**Time-resolved fast imaging of metal nanoparticle inks during LIFT process**, Ludovic Rapp<sup>1</sup>, Emeric Biver<sup>1</sup>, Julie Ailuno<sup>1</sup>, Anne-Patricia Alloncle<sup>1</sup>, Philippe Delaporte<sup>1</sup>, <sup>1</sup>*Aix-Marseille University, CNRS, LP3 Laboratory, France*

14:50 Tu2-0L-3

**Time-resolved soft x-ray imaging of femtosecond laser ablation process in metals**, Takuro Tomita<sup>1</sup>, Masaharu Nishikino<sup>2</sup>, Noboru Hasegawa<sup>2</sup>, Yasuo Minami<sup>3</sup>, Ryota Takei<sup>3</sup>, Motoyoshi Baba<sup>3</sup>, Takashi Eyama<sup>1</sup>, Shodai Takayoshi<sup>1</sup>, Takeshi Kaihori<sup>2</sup>, Toshimasa Morita<sup>2</sup>, Yusuke Hirano<sup>2</sup>, Tetsuya Kawachi<sup>2</sup>, Mitsuru Yamagiwa<sup>2</sup>, Tohru Suemoto<sup>3</sup>, <sup>1</sup>*Faculty of Engineering, The University of Tokushima, Japan*, <sup>2</sup>*Quantum Beam Science Directorate, Japan Atomic Energy Agency, Japan*, <sup>3</sup>*Institute for Solid State Physics, The University of Tokyo, Japan*

15:10 Tu2-0L-4

**Time-resolved phase contrast microscopy with random lasers applied to the monitoring of fs laser-induced microdots in a-SiO<sub>2</sub>**, Alexandre Mermillod-Blondin<sup>1</sup>, Heiko Mentzel<sup>1</sup>, Arkadi Rosenfeld<sup>1</sup>, <sup>1</sup>*Max-Born-Institute Berlin, Germany*

15:30 Coffee Break



## 5. LPM

## Room 3

## Glass Processing I

Chair: Michael Schmidt

14:00 Tu3-0L-1 Student

**Laser-induced structural modifications in glass using a femtosecond laser and a CO<sub>2</sub> laser**, Takuto ASADA<sup>1</sup>, Masaya NAKAZUMI<sup>1</sup>, Takayuki TAMAKI<sup>1</sup>, Etsuji OHMURA<sup>2</sup>, Kazuyoshi ITOH<sup>2</sup>,  
<sup>1</sup>Nara National College of Technology, Japan, <sup>2</sup>Osaka University, Japan

14:20 Tu3-0L-2

**A physico-chemical approach for the modification energy threshold by femtosecond laser irradiation in glasses**, Matthieu Lancry<sup>1</sup>, Bertrand Poumellec<sup>1</sup>, <sup>1</sup>University Paris Sud-CNRS, France

14:40 Tu3-0L-3

**Femtosecond micromachining of ceramic fibers for electric contact soldering**, Valdas Sirutkaitis<sup>1</sup>, Domas Paipulas<sup>1</sup>, Aleksandr Alesnikov<sup>1</sup>, Gediminas Chazėvskis<sup>1</sup>, Paulius Ragulis<sup>2</sup>, Žilvinas Kancleris<sup>2</sup>,  
<sup>1</sup>Vilnius University, Laser Research Center, Lithuania, <sup>2</sup>Center for Physical Sciences and Technology, Lithuania

15:00 Tu3-0L-4

**Controllable 3D crystallization in SiO<sub>2</sub>-based glasses by femtosecond laser**, Xuan He<sup>1,2</sup>, Chaxing Fan<sup>3</sup>, Bertrand Poumellec<sup>1</sup>, Francois Brisset<sup>1</sup>, Qiming Liu<sup>2</sup>, Guorong Chen<sup>3</sup>, Xiujuan Zhao<sup>2</sup>, Matthieu Lancry<sup>1</sup>, <sup>1</sup>University Paris Sud-CNRS, France, <sup>2</sup>Key Laboratory of Artificial Micro- and Nano-structures of Ministry of Education, Wuhan University, China, <sup>3</sup>Key Laboratory for Ultrafine Materials, East China University of Science and Technology, China

15:20 Tu3-0L-5

**Crack-free microfabrication of glass ceramic using visible LIBWE**, Ji-Yen Cheng<sup>1</sup>, Huai-Yi Chen<sup>2</sup>, Mansoureh Zarei Mousavi<sup>3</sup>, Chia-Hao Chang<sup>4</sup>, Chou-Yuan-Yuan Chang<sup>1</sup>, <sup>1</sup>Research Center for Applied Sciences, Academia Sinica Taiwan, Taiwan, <sup>2</sup>Department of Mechanical and Mechatronic Engineering, National Taiwan Ocean University, Taiwan, <sup>3</sup>Department of Chemistry, National Taiwan University, Taiwan, <sup>4</sup>Institute of Polymer Science and Engineering, National Taiwan University, Taiwan

15:40 Coffee Break

## 7. HPL 1

## Room 4

## System I

Chair: Jingbo Wang

14:00 Tu4-0H-1

**New trends in solid state laser of Trumpf**, Tsuyoshi Nakamura<sup>1</sup>, Bastian Becker<sup>1</sup>, <sup>1</sup>Trumpf Corporation, Japan

14:20 Tu4-0H-2

**The manufacture and sensing sensitivity of all-fiber Mach-Zehnder interferometer with different taper structure and fusion-stretching process**, Yi-Cheng Hsu<sup>1</sup>, Hsun-Heng Tsai<sup>1</sup>, Shang-Chao Hung<sup>2</sup>, Hsin-Wen Wang<sup>1</sup>, Wei-Jen Cheng<sup>1</sup>, <sup>1</sup>Department of Biomechanics Engineering, National Pingtung University of Science and Technology, Taiwan, <sup>2</sup>Department of Information Technology and Communication, Shih Chien University Kaohsiung Campus, Taiwan

14:40 Tu4-0H-3

**Measurement of calcium hydroxide solution using a fiber-optic Mach-Zehnder interferometer sensor**, Jian-Neng Wang<sup>1</sup>, Wei-Te Wu<sup>2</sup>, Chien-Hsing Chen<sup>3</sup>, Ching-Ying Luo<sup>1</sup>, <sup>1</sup>National Yunlin University of Science and Technology, Taiwan, <sup>2</sup>National Pingtung University of Science and Technology, Taiwan, <sup>3</sup>National Chung Cheng University, Taiwan

15:00 Tu4-0H-4

**Fundamental study on the laser welding phenomena with high frequency laser beam oscillation**, Yosuke Yamazaki<sup>1</sup>, Yohei Abe<sup>2</sup>, Akikazu Kitagawa<sup>2</sup>, Kazuhiro Nakata<sup>1</sup>, <sup>1</sup>Joining and Welding Research Institute, Osaka University, Japan, <sup>2</sup>Hitachi Zosen Corporation, Japan

15:20 Tu4-0H-5

**Visualization and analysis of laser cutting of mild and stainless steel with fiber and CO<sub>2</sub> lasers**, Ermolaev V Grigory<sup>1</sup>, Zaitsev V Alexander<sup>1</sup>, Kovalev B Oleg<sup>1</sup>, Yudin V Petr<sup>1</sup>, <sup>1</sup>Khrstianovich Institute of Theoretical and Applied Mechanics, SB RAS, Russia

15:40 Coffee Break

2. LPM

Room 1

Patterning II

Chair: Claudia Hartmann

16:00 Tu1-0L-9

**Ultrashort laser processing inside transparent films**, Kitty Kumar<sup>1</sup>, Kenneth K.C. Lee<sup>2</sup>, Jianzhao Li<sup>2</sup>, Jun Nogami<sup>1</sup>, Nazir P. Kherani<sup>2</sup>, Peter R. Herman<sup>2</sup>, <sup>1</sup>*Department of Materials Science and Engineering, 184 College Street, Toronto, Ontario, M5S 3E4, Canada*, <sup>2</sup>*Department of Electrical and Computer Engineering, 10 King's College Rd., Toronto, Ontario, M5S 3G4, Canada*

16:20 Tu1-0L-10

**Fast and flexible generation of conductive circuits**, Philipp Amend<sup>1</sup>, Oliver Hentschel<sup>2</sup>, Christian Scheitler<sup>2</sup>, Marcus Baum<sup>2</sup>, Michael Schmidt<sup>3</sup>, <sup>1</sup>*Bayerisches Laserzentrum GmbH, Germany*, <sup>2</sup>*Chair of Photonic Technologies, Germany*, <sup>3</sup>*School in Advanced Optical Technologies, Germany*

16:40 Tu1-0L-11

**Microstructuring of transparent dielectric films by TWIN-LIBWE method for OWLS applications**, Csaba Vass<sup>1</sup>, Balint Kiss<sup>1</sup>, Ferenc Ujhelyi<sup>2</sup>, <sup>1</sup>*Department of Optics and Quantum Electronics, University of Szeged, Hungary*, <sup>2</sup>*Department of Atomic Physics, Physical Institute, Budapest University of Technology and Economics, Hungary*

17:00 Tu1-0L-12

**Cavitation bubble dynamics during laser wet etching of transparent sapphire substrates by 1064 nm laser irradiation**, X.Z Xie<sup>1</sup>, M.F Hu<sup>1</sup>, W.F Chen<sup>2</sup>, W.F Chen<sup>3</sup>, X Wei<sup>1</sup>, W Hu<sup>1</sup>, X.R Yuan<sup>1</sup>, X.Y Gao<sup>1</sup>, M.H Hong<sup>4</sup>, <sup>1</sup>*School of Electromechanical Engineering, Guangdong University of Technology, China*, <sup>2</sup>*College of Mechanical Engineering, Nanjing University of Aeronautics and Astronautics, China*, <sup>3</sup>*Jiangsu Key Laboratory of Precision and Micro-manufacturing Technology, China*, <sup>4</sup>*Department of Electrical and Computer Engineering, National University of Singapore, Singapore*

17:20 Tu1-IL-13 **Invited**

**Dynamic optics for three-dimensional laser processing**, Patrick S Salter<sup>1</sup>, Martin J Booth<sup>1,2</sup>, <sup>1</sup>*Dept Engineering Science, Univ of Oxford, UK*, <sup>2</sup>*Centre for Neural Circuits and Behaviour, Univ of Oxford, UK*

4. LPM SP2-2

Room 2

High Speed Imaging and Time Resolved Measurements II

Chair: Pere Serra

16:00 Tu2-IL-5 **Invited**

**Time-resolved studies of laser-assisted bioprinting**, Claudia Unger<sup>1</sup>, Lothar Koch<sup>1</sup>, Ludger Overmeyer<sup>1</sup>, Boris N. Chichkov<sup>1</sup>, <sup>1</sup>*Laser Zentrum Hannover e.V., Hollerithallee 8, 30419 Hannover, Germany*

16:30 Tu2-IL-6 **Invited**

**Time-resolved digital holography in the investigation of ablation and micro fabrication by femtosecond pulses**, Aivaras Urniezius<sup>1</sup>, Nerijus Siaulyis<sup>1</sup>, Andrius Melninkaitis<sup>1</sup>, Viaceslav Kudriasov<sup>1</sup>, Valdas Sirutkaitis<sup>1</sup>, <sup>1</sup>*Laser Research Centre, Vilnius University, Lithuania*

17:00 Tu2-0L-7

**Fabrication of micro/nano-structures by femtosecond laser direct writing**, Chung-Wei Cheng<sup>1</sup>, Xian-Zhe Tsai<sup>2</sup>, Chih-Wei Chien<sup>1</sup>, Jenq-Shyong Chen<sup>2</sup>, <sup>1</sup>*ITRI, Taiwan*, <sup>2</sup>*National Chung Hsing University, Taiwan*

17:20 Tu2-0L-8 **Student**

**Effects of focal position and liquid properties on under-liquid laser-induced shock process studied by time-resolved photoelasticity imaging technique**, Thao Thi Phuong Nguyen<sup>1</sup>, Rie Tanabe<sup>1</sup>, Yoshiro Ito<sup>1</sup>, <sup>1</sup>*Department of Mechanical Engineering, Nagaoka University of Technology, Japan*

## 6. LPM

## Room 3

## Direct Write / LIFT

Chair: Xianfan Xu

16:00 Tu3-OL-6

**Realization of structural color by direct laser write technique in photoresist**, Vyngantas Mizeikis<sup>1</sup>, Vytautas Purlys<sup>2</sup>, Ričardas Buividas<sup>3</sup>, Saulius Juodkazis<sup>3</sup>, <sup>1</sup>*Division of Global Research Leaders (Research Institute of Electronics), Shizuoka University, Japan*, <sup>2</sup>*Laser Research Center, Department of Quantum Electronics, Vilnius University, Lithuania*, <sup>3</sup>*Centre for Micro-Photonics, Swinburne University of Technology, Australia*

16:20 Tu3-OL-7

**Droplet ejection in laser-induced forward transfer: Mechanism for contamination**, R. Pohl<sup>1</sup>, C.W. Visser<sup>2</sup>, G.R.B.E. Römer<sup>1</sup>, C. Sun<sup>2</sup>, A.J. Huis in't Veld<sup>1</sup>, D. Lohse<sup>2</sup>, <sup>1</sup>*Chair of Applied Laser Technology, Faculty of Engineering Technology, University of Twente, The Netherlands*, <sup>2</sup>*Physics of Fluids, Faculty of Science and Technology, Mesa+ Institute, University of Twente, The Netherlands*

16:40 Tu3-OL-8

**On-demand deposition of functional oxide microdots by double-pulse laser-induced dot transfer**, Aiko Narazaki<sup>1</sup>, Ryozi Kurosaki<sup>1</sup>, Tadatake Sato<sup>1</sup>, Yoshizo Kawaguchi<sup>1</sup>, Hiroyuki Niino<sup>1</sup>, <sup>1</sup>*National Institute of Advanced Industrial Science and Technology (AIST), Japan*

17:00 Tu3-IL-9 **Invited**

**Beyond the diffraction limit: Laser fabrication of 3D nanostructures**, Maria Farsari<sup>1</sup>, <sup>1</sup>*IESL-FORTH, Heraklion, Greece*

17:30 Tu3-IL-10 **Invited**

**Laser-induced forward transfer (LIFT) of functional materials**, Thomas K. Lippert<sup>1</sup>, <sup>1</sup>*Paul Scherrer Institut, Switzerland*

## 8. HPL 2

## Room 4

## System II

Chair: Martin Dahmen

16:00 Tu4-IH-6 **Invited**

**Latest approaches in process monitoring for high power processing on hybrid welding**, Markus Kogel-Hollacher<sup>1</sup>, Christian Staudenmaier<sup>1</sup>, <sup>1</sup>*Precitec GmbH & Co. KG, Draisstrasse 1, 76571 Gaggenau, Germany*

16:30 Tu4-OH-7 **Student**

**Isochronous high-speed video analysis of plasma plume, melt pool and keyhole behavior during laser metal welding**, Felix Tenner<sup>1</sup>, Christian Brock<sup>1</sup>, Florian Klämpff<sup>1</sup>, Michael Schmidt<sup>1</sup>, <sup>1</sup>*Institute of Photonic Technologies, University of Erlangen-Nuremberg, Germany*

16:50 Tu4-OH-8 **Student**

**Multiple-optics sensing and pattern recognition of high-power laser welding**, Deyong You<sup>1,2</sup>, Xiangdong Gao<sup>1</sup>, Seiji Katayama<sup>2</sup>, <sup>1</sup>*School of Electromechanical Engineering, Guangdong University of Technology, China*, <sup>2</sup>*Joining and Welding Research Institute, Osaka University, Japan*

17:10 Tu4-OH-9

**FPGA-programmed detection of seam defects for the application of laser brazing**, Michael Ungers<sup>1</sup>, Raphael Rolser<sup>1</sup>, Peter Abels<sup>1</sup>, <sup>1</sup>*Fraunhofer-Institute for Lasertechnology ILT, Germany*

17:30 Tu4-OH-10 **Student**

**Numerical 3D-simulation of dispersed impurity convection in the molten pool at laser surface metal modification.**, Aleksey Gurin<sup>1</sup>, Oleg Kovalev<sup>1</sup>, <sup>1</sup>*Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russian Federation*

Day 2: Wednesday, July 24

9. LPM SP1-1

Room 1

Laser Synthesis of Nano-Materials

Chair: Minghui Hong

8:30 We1-IL-1 **Invited**

**Laser processing of ultrathin organic coatings: Prospects in nanoscale patterning, functionalization and manipulation**, Anja Schroeter<sup>1,2</sup>, Mareike Mathieu<sup>1,2</sup>, Benjamin Klingebiel<sup>1,2</sup>, Crispin Amiri Naini<sup>1,2</sup>, Steffen Franzka<sup>1,2</sup>, Nils Hartmann<sup>1,2</sup>, <sup>1</sup>Department of Chemistry, University Duisburg-Essen, Germany, <sup>2</sup>Center for Nanointegration Duisburg-Essen, Germany

9:00 We1-OL-2 **Student**

**The voxel onset time as a method for the evaluation of two photon lithography**, Sascha Engelhardt<sup>1,2</sup>, Jenny Tempeler<sup>1</sup>, Martin Wehner<sup>2</sup>, <sup>1</sup>Institute for Laser Technology, RWTH Aachen, Germany, <sup>2</sup>Fraunhofer Institute for Laser Technology, Germany

9:20 We1-OL-3 **Student**

**Nanofabrication in ITX resist by stimulated emission depletion lithography**, JuKun Liu<sup>1</sup>, TianQing Jia<sup>2</sup>, <sup>1</sup>State Key Laboratory of Precision Spectroscopy, East China Normal University, China, <sup>2</sup>State Key Laboratory of Precision Spectroscopy, East China Normal University, China

9:40 We1-OL-4 **Student**

**Innovative resonant mid-infrared ablation of bulk polymers: PMMA**, Sanjeev Naithani<sup>1</sup>, Arnuaud Grisard<sup>2</sup>, David Schaubroeck<sup>1</sup>, Eric Lallier<sup>2</sup>, Geert Van Steenberge<sup>1</sup>, <sup>1</sup>Centre for Microsystems Technology, ELIS Department, Ghent University-IMEC, Ghent 9052, Belgium, BELGIUM, <sup>2</sup>Thales Research & Technology (TRT), 1 Av. Augustin Fresnel, 91767 Palaiseau cedex, France, FRANCE

10:00 Coffee Break

Poster I and II

Chair: Hiroyuki Niino

10:30 Short Presentation for Poster Session I and II (Room 1)

Poster I (Odd-Numbered Posters)

12:00 Poster Session I and Exhibition (Main Hall A)

Ⓞ Lunch Time (up to 13:50)

12. LPM

Room 2

Ultrafast Laser  
—Beam Shaping—

Chair: Matthieu Lancry

8:30 We2-OL-1

**Modulation of crack generation inside a LiF single crystal by interference of laser induced stress waves**, Masaaki Sakakura<sup>1</sup>, Yuki Ishiguro<sup>2</sup>, Naoaki Fukuda<sup>1</sup>, Yasuhiko Shimotsuma<sup>2</sup>, Kiyotaka Miura<sup>2</sup>, <sup>1</sup>Office of Society-Academia Collaboration for Innovation, Kyoto University, Japan, <sup>2</sup>Graduate School of Engineering, Kyoto University, Japan

8:50 We2-OL-2

**Spatial shaping of femtosecond laser beam for high speed multi-scale surface structuring of materials**, Cyril Mauchclair<sup>1</sup>, David Pietroy<sup>1</sup>, Emmanuel Baubeau<sup>2</sup>, Razvan Stoian<sup>1</sup>, Eric Audouard<sup>1</sup>, <sup>1</sup>Laboratoire Hubert Curien, UMR 5516 CNRS, Université de Lyon, Université Jean Monnet Saint Etienne, France, <sup>2</sup>Impulsion SAS, France

9:10 We2-OL-3

**Coherent control of two-photon absorption and microfabrication in ITX polymer by shaped ultrashort laser pulses**, Tianqing Jia<sup>1</sup>, <sup>1</sup>State Key Laboratory of Precision Spectroscopy, Department of Physics, East China Normal University, P.R. China

9:30 We2-OL-4

**Visualization of spatio-temporally focused spot**, Fei He<sup>1</sup>, Jintian Lin<sup>1</sup>, Yang Liao<sup>1</sup>, Lingling Qiao<sup>1</sup>, Ya Cheng<sup>1</sup>, Koji Sugioka<sup>2</sup>, Katsumi Midorikawa<sup>2</sup>, <sup>1</sup>Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China, <sup>2</sup>Laser Technology Laboratory, RIKEN - Advanced Science Institute, Japan

9:50 Coffee Break

## Day 2: Wednesday, July 24

### 15. LPM

### Room 3

#### Microwelding

Chair: Peter Herman

8:30 We3-OL-1

**Crack-free mechanism in USLP welding of glass in cooling process**, Isamu Miyamoto<sup>1,2</sup>, Kristian Cvecek<sup>3</sup>, Michael Schmidt<sup>2,3,4</sup>, <sup>1</sup>*Osaka University, Japan*, <sup>2</sup>*Erlangen Graduate School of Advanced Optical Technologies, Germany*, <sup>3</sup>*Bayerisches Laserzentrum, Germany*, <sup>4</sup>*University Erlangen-Nuremberg, Germany*

8:50 We3-OL-2

**Crack-free conditions in USLP welding of glass in heating process**, Isamu Miyamoto<sup>1,2</sup>, Kristian Cvecek<sup>3</sup>, Michael Schmidt<sup>2,3,4</sup>, <sup>1</sup>*Osaka University, Japan*, <sup>2</sup>*Erlangen Graduate School of Advanced Optical Technologies, Germany*, <sup>3</sup>*Bayerisches Laserzentrum, Germany*, <sup>4</sup>*University Erlangen-Nuremberg, Germany*

9:10 We3-OL-3 *Student*

**Experimental and theoretical investigation of physical mechanism of ultrafast laser glass microwelding**, Sizhu Wu<sup>1</sup>, Dong Wu<sup>1</sup>, Koji Sugioka<sup>1</sup>, Katsumi Midorikawa<sup>1</sup>, <sup>1</sup>*RIKEN, Japan*

9:30 We3-OL-4

**Spatially modulated laser beam micro welding of CuSn<sub>6</sub> and nickel-plated DC04 steel for battery applications**, Benjamin Mehlmann<sup>1</sup>, Alexander Olowinsky<sup>1</sup>, Michael Thuilot<sup>1</sup>, Arnold Gillner<sup>1</sup>, <sup>1</sup>*Fraunhofer Institute for Laser Technology ILT, Germany*

9:50 *Coffee Break*

### 18. HPL 3

### Room 4

#### Welding I

Chair: Francis Briand

8:30 We4-OH-1

**Pulsed laser spot welding of spacer grid assembly for nuclear application**, Yanbin Chen<sup>1</sup>, Wang Tao<sup>1</sup>, Chuang Cai<sup>1</sup>, Liqun Li<sup>1</sup>, <sup>1</sup>*State Key Laboratory of Advanced Welding & Joining Harbin Institute of Technology, China*

8:50 We4-OH-2 *Student*

**Three-dimensional visualization of laser welding phenomena with X-ray real-time transmission system**, Yuichiro Doi<sup>1</sup>, Yousuke Kawahito<sup>1</sup>, Seiji Katayama<sup>1</sup>, <sup>1</sup>*Joining and Welding Research Institute (JWRI), Osaka University, Japan*

9:10 We4-OH-3 *Student*

**Investigation of spatter formation in laser welding of copper using high-speed online X-ray imaging**, Andreas Heider<sup>1</sup>, Meiko Boley<sup>1</sup>, Rudolf Weber<sup>1</sup>, Thomas Graf<sup>1</sup>, <sup>1</sup>*Institut fuer Strahlwerkzeuge (IFSW), University of Stuttgart, Germany*

9:30 We4-OH-4 *Student*

**In-situ temperature measurement using multi-sensors camera during laser welding**, Shotaro Yamashita<sup>1</sup>, Motomichi Yamamoto<sup>1</sup>, Kenji Shinozaki<sup>1</sup>, Kota Kadoi<sup>1</sup>, Kenji Mitsui<sup>2</sup>, Hiroyuki Usui<sup>3</sup>, <sup>1</sup>*Graduate School of Engineering, Hiroshima University, Japan*, <sup>2</sup>*Mitsui Photonics Ltd., Japan*, <sup>3</sup>*Nobby Tech. Ltd., Japan*

9:50 *Coffee Break*

### Poster I and II

Chair: Hiroyuki Niino

10:30 **Short Presentation for Poster Session I and II (Room 1)**

### Poster I (Odd-Numbered Posters)

12:00 **Poster Session I and Exhibition (Main Hall A)**

*ℳ Lunch Time (up to 13:50)*



## 10. LPM SP1-2

## Room 1

## Laser nanostructuring

Chair: Nils Hartmann

14:00 We1-IL-5 **Invited**

**Laser fabrication of plasmonic nanostructures for 3D light manipulation, sensing, and energy**, C. M. Chang<sup>1,3,4</sup>, M. L. Tseng<sup>2,3</sup>, Y.-H. Cheng<sup>2,3</sup>, K. S. Chung<sup>3</sup>, Y. L. Chen<sup>2,3</sup>, D. P. Tsai<sup>2,3,4</sup>, <sup>1</sup>Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan, <sup>2</sup>Graduate Institute of Applied Physics, National Taiwan University, Taiwan, <sup>3</sup>Department of Physics, National Taiwan University, Taiwan, <sup>4</sup>Research Center for Applied Sciences, Academia Sinica, Taiwan

14:30 We1-OL-6 **Student**

**Time-resolved diffraction during the formation of femtosecond laser-induced periodic surface structures on dielectrics**, Sandra Höhm<sup>1</sup>, Arkadi Rosenfeld<sup>1</sup>, Jörn Bonse<sup>2</sup>, Jörg Krüger<sup>2</sup>, 1Max-Born-Institut, Germany, <sup>2</sup>BAM Bundesanstalt für Materialforschung und -prüfung, Germany

14:50 We1-OL-7

**Size scaling of mesoporous silica membranes produced by laser irradiation of nanosphere arrays**, David Grojo<sup>1</sup>, Lucas Boarino<sup>2</sup>, Natalia De Leo<sup>2</sup>, R Rocci<sup>2</sup>, G Panzarasa<sup>3</sup>, Philippe Delaporte<sup>1</sup>, M Laus<sup>3</sup>, K Sparnacci<sup>3</sup>, 1Aix-Marseille University, CNRS, LP3 UMR 7341, F-13288, Marseille, France, <sup>2</sup>INRIM, NanoFacility, Division Electromagnetism, Strada delle Cacce 91, I-10135 Torino, Italy, <sup>3</sup>University of Eastern Piedmont Amedeo Avogadro, Alessandria, Italy

15:10 We1-OL-8

**On ripple formation in various metals and super-hard tetrahedral amorphous carbon films in consequence of femtosecond laser irradiation**, Steffen Weissmantel<sup>1</sup>, Manuel Pfeiffer<sup>1</sup>, Hagen Gruettner<sup>1</sup>, Andy Engel<sup>1</sup>, Katja Guenter<sup>1</sup>, Franka Marquardt<sup>1</sup>, Guenter Reisse<sup>1</sup>, 1University of Applied Sciences Mittweida, Germany

15:30 Coffee Break

## 13. LPM

## Room 2

Ultrafast Laser  
—Surface Modification—

Chair: Juergen Reif

14:00 We2-OL-5

**Morphology of superblack surfaces machined by femtosecond lasers**, Rainer Kling<sup>1</sup>, John Lopez<sup>3</sup>, Clemens Hoenninger<sup>2</sup>, Eric Mottay<sup>2</sup>, 1Alphanov, 351 Cours de la Libération, Bâtiment A11, 33405 Talence, France, France, <sup>2</sup>Amplitude Systemes, 11 avenue de Canteranne, Cité de la Photonique, 33600 Pessac, France, France, <sup>3</sup>Université de Bordeaux, CNRS, CEA, Celia UMR 5107, 33405 Talence, France, France

14:20 We2-OL-6

**Multiscale textured surfaces by femtosecond laser: Static and dynamic wettability**, Stéphane Valette<sup>1</sup>, Pavel Bizi-Bandoki<sup>1</sup>, Stéphane Benayoun<sup>1</sup>, 1Ecole Centrale de Lyon Laboratoire de Tribologie et Dynamique des Systèmes, France

14:40 We2-OL-7 **Student**

**Polypropylene surface wettability modification using femtosecond laser irradiation**, Vanessa Belaud<sup>1</sup>, Stéphane Valette<sup>1</sup>, Guy Stremsdoerfer<sup>1</sup>, Eric Audouard<sup>2</sup>, 1LTDS, France, <sup>2</sup>LHC, France

15:00 We2-OL-8 **Student**

**Femtosecond laser – polymer interaction: Different ablation regimes**, Vanessa Belaud<sup>1</sup>, Maxence Bigerelle<sup>2</sup>, Stéphane Valette<sup>1</sup>, Guy Stremsdoerfer<sup>1</sup>, Eric Audouard<sup>3</sup>, Stéphane Benayoun<sup>1</sup>, 1LTDS, France, <sup>2</sup>Université de Valenciennes, France, <sup>3</sup>LHC, France

15:20 We2-OL-9 **Student**

**Shape control of periodic microstructures by two interfered laser pluses**, Osamu Konda<sup>1</sup>, Takumi Sato<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>, Shingo Ono<sup>1</sup>, Michiharu Ota<sup>2</sup>, 1Nagoya Institute of Technology, Japan, <sup>2</sup>AISIN SEIKI CO., LTD, Japan

15:40 Coffee Break

## 16. LPM

## Room 3

## Film Deposition / PLD

Chair: Thomas Lippert

14:00 We3-OL-5 Student

**Growth of Nd<sup>3+</sup>-ion doped fluoride thin films by pulsed laser deposition**, Naoki Yoshida<sup>1</sup>, Mirai Ieda<sup>1</sup>, Shingo Ono<sup>1</sup>, Kohei Yamanoi<sup>2</sup>, Toshihiko Shimizu<sup>2</sup>, Nobuhiko Sarukura<sup>2</sup>, Yuui Yokota<sup>3</sup>, Takayuki Yanagida<sup>4</sup>, Akira Yoshikawa<sup>3</sup>, <sup>1</sup>*Nagoya Institute of Technology, Japan*, <sup>2</sup>*Institute of Laser Engineering, Osaka University, Japan*, <sup>3</sup>*Institute for Materials Research, Tohoku University, Japan*, <sup>4</sup>*Kyushu Institute of Technology, Japan*

14:20 We3-OL-6 Student

**Fabrication of diamond-like carbon (DLC) films with pre-designed gradient profiles using pulsed laser deposition**, Yoo Jai Won<sup>1</sup>, Hyungson Ki<sup>1</sup>, <sup>1</sup>*Ulsan National Institute of Science and Technology, South Korea*

14:40 We3-IL-7 Invited

**Recent advancement in laser processing of long-length high-performance RE-123 superconducting wires**, Takanobu Kiss<sup>1</sup>, Teruo Izumi<sup>2</sup>, Yasuhiro Iijima<sup>3</sup>, Yuh Shiohara<sup>2</sup>, <sup>1</sup>*Dept. of Electrical Engineering, Kyushu University*, <sup>2</sup>*Superconductivity Research Laboratory, International Superconductivity Technology Center*, <sup>3</sup>*Fujikura Ltd.*, <sup>3</sup>

15:10 We3-OL-8

**Synthesis of various sized microspheres by laser ablation and their lasing characteristics**, Daisuke Nakamura<sup>1</sup>, Tetsuya Shimogaki<sup>1</sup>, Kota Okazaki<sup>1</sup>, Mitsuhiko Higashihata<sup>1</sup>, Hiroshi Ikenoue<sup>1</sup>, Tatsuo Okada<sup>1</sup>, <sup>1</sup>*Kyushu University, Japan*

15:30 We3-OL-9

**Femtosecond laser-induced nanoparticle precipitation using plasmonic enhancement effects**, Hiroaki Nishiyama<sup>1</sup>, Shintaro Okamoto<sup>2</sup>, <sup>1</sup>*Graduate School of Science and Engineering, Yamagata University, Japan*, <sup>2</sup>*RIES, Hokkaido University, Japan*

15:50 Coffee Break

## 19. HPL 4

## Room 4

## Welding II

Chair: Dirk Petring

14:00 We4-IH-5 Invited

**Solidification cracking susceptibility of modified 9Cr-1Mo steel weld metal during hot wire laser welding with narrow gap groove**, Rittichai Phaonaim<sup>1</sup>, Kenji Shinozaki<sup>1</sup>, Motomichi Yamamoto<sup>1</sup>, Kota Kadoi<sup>1</sup>, <sup>1</sup>*Hiroshima University, Japan*

14:30 We4-OH-6

**Control of arc behavior by YAG laser in hybrid-welding of thin metal plates**, Yuichiro Murata<sup>1</sup>, Akihiko Itoh<sup>2</sup>, Jiwang Yan<sup>2</sup>, Yasuo Suga<sup>2</sup>, <sup>1</sup>*Mitsubishi Heavy Industries, LTD., Japan*, <sup>2</sup>*Keio University, Japan*

14:50 We4-IH-7 Invited

**Recent technological tendency of laser/arc hybrid welding**, Young Sik Kim<sup>1</sup>, Sang Cheol Kil<sup>2</sup>, Jong Do Kim<sup>3</sup>, <sup>1</sup>*The Senior Research Fellow, Korea Institute of Science and Technology Information, Busan, Republic of Korea*, <sup>2</sup>*Korea Institute of Science and Technology Information, Seoul, Republic of Korea*, <sup>3</sup>*Korea Maritime University, Busan, Republic of Korea*

15:20 We4-OH-8 Student

**The effect of edge surface preparation on welding efficiency of laser welding of low-alloyed steels**, Mikhail Sokolov<sup>1</sup>, Antti Salminen<sup>1</sup>, <sup>1</sup>*Laboratory of Laser Processing, Lappeenranta University of Technology, Finland*

15:40 Coffee Break

## 11. LPM SP1-3

Room 1

## Laser nanofabrication

Chair: Craig B. Arnold

16:10 We1-IL-9 **Invited**

**Fabrication and application of submicron spherical particles prepared by pulsed laser melting in liquid**, Naoto Koshizaki<sup>1</sup>, Yoshie Ishikawa<sup>2</sup>, Alexander Pyatenko<sup>1</sup>, Yukiko Katou<sup>1</sup>, Takeshi Tsuji<sup>3</sup>, <sup>1</sup>Nanosystem Research Institute, National Institute of Advanced Industrial Science and Technology, Japan, <sup>2</sup>Department of Advanced Materials Science, Faculty of Engineering, Kagawa University, Japan, <sup>3</sup>Institute of Materials Chemistry and Engineering, Kyushu University, Japan

16:40 We1-OL-10

**Growth and stability of laser-fabricated gold nanoparticles in the presence of low salinity electrolytes**, Christoph Rehbock<sup>1</sup>, Vivian Merk<sup>1</sup>, Stephan Barcikowski<sup>1</sup>, <sup>1</sup>Technical Chemistry I, University of Duisburg-Essen and Center for Nanointegration Duisburg-Essen, Germany

17:00 We1-OL-11

**Hybrid laser-synthesized nanoparticles for strong optical limiting response**, Ming Hui Hong<sup>1</sup>, Tsung Sheng Kao<sup>1</sup>, Wei Qiang Chen<sup>2</sup>, Zhe Xu<sup>2</sup>, Wei Ji<sup>2</sup>, <sup>1</sup>Department of Electrical & Computer Engineering, National University of Singapore, Singapore, <sup>2</sup>Department of Physics, National University of Singapore, Singapore

17:20 We1-OL-12

**High-yield production of nanoparticles by using wire ablation**, René Streubel<sup>1</sup>, Gabriele C. Messina<sup>2</sup>, Philipp Wagener<sup>1</sup>, Alessandro De Giacomo<sup>3</sup>, Antonio Santagata<sup>4</sup>, Giuseppe Compagnini<sup>2</sup>, Stephan Barcikowski<sup>1</sup>, <sup>1</sup>University of Duisburg-Essen and Center of Nanointegration Duisburg-Essen, Germany, <sup>2</sup>University of Catania, Italy, <sup>3</sup>University of Bari, Italy, <sup>4</sup>CNR-IMIP, UOSPotenza, Italy

17:40 We1-OL-13

**Nanoparticle formation after pulsed laser ablation in liquid studied with high time resolution small angle x-ray scattering**, Philipp Wagener<sup>1</sup>, Shyjumon Ibrahimkutty<sup>2</sup>, Andreas Menzel<sup>3</sup>, Anton Plech<sup>2</sup>, Stephan Barcikowski<sup>1</sup>, <sup>1</sup>University of Duisburg-Essen, Germany, <sup>2</sup>Karlsruhe Institute of Technology, Karlsruhe, <sup>3</sup>Paul-Scherrer-Institute, Switzerland

## 14. LPM

Room 2

## Ultrafast Laser —Glass Processing—

Chair: Steffen Weissmantel

16:10 We2-OL-10 **Student**

**Analysis of internal processing phenomena of glass by repetitive irradiation of ultrashort pulse laser**, Tomoaki Murakami<sup>1</sup>, Etsuji Ohmura<sup>1</sup>, <sup>1</sup>Osaka University, Japan

16:30 We2-OL-11

**Bubble formation in glasses generated by ultra short laser pulses**, Kristian Cvecek<sup>1</sup>, Isamu Miyamoto<sup>2</sup>, Michael Schmidt<sup>3</sup>, <sup>1</sup>Bayerisches Laserzentrum GmbH, Germany, <sup>2</sup>Osaka University, Japan, <sup>3</sup>Chair of Photonic Technologies, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany

16:50 We2-OL-12

**Femtosecond-laser nanostructuring in glass**, Yasuhiko Shimotsuma<sup>1</sup>, Taiga Asai<sup>1</sup>, Masaaki Sakakura<sup>2</sup>, Kiyotaka Miura<sup>1</sup>, <sup>1</sup>Department of Material Chemistry, Kyoto University, Japan, <sup>2</sup>Office of Society-Academia Collaboration for Innovation, Kyoto University, Japan

17:10 We2-OL-13

**Controlling UV-Vis birefringence photo-induced by femtosecond laser in silica**, Matthieu Lancry<sup>1</sup>, Antoine Weickman<sup>1</sup>, Bertrand Poumellec<sup>1</sup>, Martynas Beresna<sup>2</sup>, Peter Kazansky<sup>2</sup>, <sup>1</sup>Institut de Chimie Moléculaire et des Matériaux d'Orsay, UMR CNRS-PSUD 8182, Université de Paris Sud, France, <sup>2</sup>Optoelectronics Research Centre, University of Southampton, UK

17:30 We2-OL-14

**Monolithic electro-fluidic glass microchips fabricated by three-dimensional femtosecond laser direct writing**, Jian Xu<sup>1</sup>, Dong Wu<sup>1</sup>, Sizhu Wu<sup>1</sup>, Koji Sugioka<sup>1</sup>, Katsumi Midorikawa<sup>1</sup>, <sup>1</sup>Laser Technology Laboratory, RIKEN, Japan

17:50 We2-OL-15

**Large mode area waveguides by femtosecond laser photoinscription in chalcogenide glasses**, Ciro D'Amico<sup>1</sup>, Guanghua Cheng<sup>2</sup>, Razvan Stoian<sup>1</sup>, <sup>1</sup>Laboratoire Hubert Curien, UMR 5516 CNRS, Université Jean Monnet, 42000 St Etienne, France, <sup>2</sup>State Key Laboratory of Transient Optics and Photonics, CAS, 710119 Xi'an, Shaanxi, China

## Banquet

18:30 from the venue to Banquet on foot

19:00 Banquet (Hotel Nikko Niigata, Room "Toki-no-ma")



## 17. LPM

## Room 3

## 20. HPL 5

## Room 4

## Fundamental Aspects

## Welding III

Chair: Scott A. Mathews

Chair: Markus Kogel-Hollacher

16:10 We3-0L-10

**Ultrashort laser pulse modification of transparent solids: What can be learnt from simulations and energy balance?**, Vladimir P. Zhukov<sup>1</sup>, Yuri P. Meshcheryakov<sup>2</sup>, Nadezhda M. Bulgakova<sup>3</sup>, Nadezhda M. Bulgakova<sup>4</sup>, <sup>1</sup>*Institute of Computational Technologies SB RAS, Russia*, <sup>2</sup>*Design and Technology Branch of Lavrentyev Institute of Hydrodynamics SB RAS, Russia*, <sup>3</sup>*Optoelectronics Research Center, University of Southampton, United Kingdom*, <sup>4</sup>*Institute of Thermophysics SB RAS, Russia*

16:30 We3-0L-11 Student

**A study of laser beam absorption using the FDTD method**, Chun Deng<sup>1</sup>, Hyungson Ki<sup>1</sup>, <sup>1</sup>*Ulsan National Institute of Science and Technology, South Korea*

16:50 We3-0L-12

**Ablation of copper by a single ultrashort laser pulse**, S. Y. Wang<sup>1</sup>, Yunpeng Ren<sup>2</sup>, C. P. Chang<sup>1</sup>, C. W. Cheng<sup>1</sup>, J. K. Chen<sup>2</sup>, D. Y. Tzou<sup>2</sup>, <sup>1</sup>*ITRI, Taiwan*, <sup>2</sup>*University of Missouri, USA*

17:10 We3-0L-13

**Laser processing of glass, sapphire and ceramics: Intensive pulses for hard and brittle materials**, Christof Siebert<sup>1</sup>, Simone Russ<sup>2</sup>, Severin Luzius<sup>1</sup>, Jan Wieduwilt<sup>1</sup>, Birgit Faisst<sup>1</sup>, <sup>1</sup>*TRUMPF Laser- und Systemtechnik GmbH, Germany*, <sup>2</sup>*TRUMPF Laser GmbH + Co. KG, Germany*

17:30 We3-0L-14 Student

**Processing conditions for laser-induced subsurface modifications in Si**, P. C. Verburg<sup>1</sup>, G. R.B.E. Römer<sup>1</sup>, A. J. Huis in 't Veld<sup>1,2</sup>, <sup>1</sup>*University of Twente, Faculty of Engineering Technology, Chair of Applied Laser Technology, The Netherlands*, <sup>2</sup>*TNO Technical Sciences; Mechatronics, Mechanics and Materials, The Netherlands*

17:50 We3-0L-15 Student

**Analysis of femtosecond laser drilling in porous ceramics**, Young Min Lee<sup>1</sup>, Hae Woon Choi<sup>1</sup>, <sup>1</sup>*Keimyung University, Korea*

16:10 We4-0H-9

**Full argon solutions for YAG and CO<sub>2</sub> laser welding: Focus on tailored blanks and overlap zinc coated plate applications**, Francis Briand<sup>1</sup>, Gaia Ballerini<sup>1</sup>, Philippe Lefebvre<sup>1</sup>, Katsusuke Niki<sup>2</sup>, <sup>1</sup>*Air Liquide, France*, <sup>2</sup>*Japan Air Gases, Japan*

16:30 We4-0H-10

**A study on the compressible plume dynamics inside a transient keyhole during laser welding**, Pang Shengyong<sup>1</sup>, Chen Weidong<sup>1</sup>, Zhou Jianxin<sup>1</sup>, Liao Dunming<sup>1</sup>, <sup>1</sup>*Huazhong University of Science and Technology, China*

16:50 We4-0H-11

**Laser beam welding of ultra-high strength steel sheets**, Martin Dahmen<sup>1</sup>, Xingfeng Han<sup>1</sup>, Stefan Lindner<sup>2</sup>, Zhen Sun<sup>1,3</sup>, <sup>1</sup>*Fraunhofer-Institut Lasertechnik, Germany*, <sup>2</sup>*Outokumpu Nirosta GmbH, Germany*, <sup>3</sup>*Paul-Scherrer-Institut, Switzerland*

17:10 We4-0H-12

**Thick-section laser welding processes**, Jon Blackburn<sup>1</sup>, Chris Allen<sup>1</sup>, Sullivan Smith<sup>1</sup>, Paul Hilton<sup>1</sup>, <sup>1</sup>*TWI Ltd, UK*

17:30 We4-0H-13 Student

**Analysis of microstructure and mechanical properties of hot-stamping heat treatment in TWB laser joints of Al-Si coated boron steel and 500 grade steel**, Myeong Hwan Oh<sup>1</sup>, Jong Pan Kong<sup>2</sup>, Hyeon Jeong Shin<sup>1</sup>, Min Suck Kwon<sup>3</sup>, Chung Yun Kang<sup>2</sup>, <sup>1</sup>*National Core Research Center, Pusan National University, Korea*, <sup>2</sup>*Pusan National University, Korea*, <sup>3</sup>*Hyundai Hysco Co.,Ltd. Lightweight and Pipe R&D Team, Korea*

17:50 We4-0H-14 Student

**The effects of hot-stamping heat treatment on tensile properties and the microstructure in TWB laser welding with filler wire of Al-Si coated boron steel**, Hyeon Jeong Shin<sup>1</sup>, Myeong Hwan Oh<sup>1</sup>, Jong Pan Kong<sup>2</sup>, Min Suck Kwon<sup>3</sup>, Chung Yun Kang<sup>2</sup>, <sup>1</sup>*National Core Research Center, Pusan National University, Korea*, <sup>2</sup>*Pusan National University, Korea*, <sup>3</sup>*Hyundai Hysco Co.,Ltd. Lightweight and Pipe R&D Team, Korea*

## Banquet

18:30 from the venue to Banquet on foot

19:00 Banquet (Hotel Nikko Niigata, Room "Toki-no-ma")

Day 3: Thursday, July 25

21. LPM

Room 1

Glass Processing II

Chair: Hong Minghui

8:30 Th1-0L-1

**Drilling micro-through holes in glass substrates with pulsed CO<sub>2</sub> lasers**, Nakamura Reona<sup>1</sup>, Katsura Tomotaka<sup>1</sup>, Fujikawa Shuichi<sup>1</sup>, Magara Takuji<sup>1</sup>, Inagawa Takahiro<sup>2</sup>, Aono Yuko<sup>2</sup>, Tokura Hitoshi<sup>2</sup>, <sup>1</sup>*Advanced Technology R&D center, Mitsubishi Electric Corp., Japan*, <sup>2</sup>*Graduate School of Science and Engineering, Tokyo Institute of Technology., Japan*

8:50 Th1-0L-2 **Student**

**Acceleration effect of quartz micromachining by high repetition rate shots of ns pulsed CO<sub>2</sub> laser**, Kota Yamasaki<sup>1</sup>, Hiroshi Ikenoue<sup>1</sup>, Daisuke Nakamura<sup>1</sup>, Yousuke Watanabe<sup>2</sup>, Tatsuo Okada<sup>1</sup>, <sup>1</sup>*Kyushu Univ., Japan*, <sup>2</sup>*GIGAPHOTON Inc., Japan*

9:10 Th1-0L-3

**Quasi-steady crack propagation analysis with few repetition steps in laser scribing of glass**, Keisuke Yahata<sup>1</sup>, Seiji Shimizu<sup>1</sup>, Masanao Murakami<sup>1</sup>, Etsuji Ohmura<sup>2</sup>, <sup>1</sup>*Mitsubodhi Diamond Industrial Co., Ltd., Japan*, <sup>2</sup>*Osaka University, Japan*

9:30 Th1-IL-4 **Invited**

**Through glass via (TGV) formation technology for 3D integrated packaging**, Kentaro Tatsukoshi<sup>1</sup>, Motoshi Ono<sup>1</sup>, Shintaro Takahashi<sup>1</sup>, <sup>1</sup>*AGC Electronics, Asahi Glass Co., Ltd., Japan*

10:00 *Coffee Break*

25. LPM

Room 2

Beam Delivery Architectures and Optical Systems for Micro Processing

Chair: Guido Hennig

8:10 Th2-IL-1 **Invited**

**Polymer based planar optronic systems**, Ludger Overmeyer<sup>1,2,3</sup>, Bernhard Roth<sup>2</sup>, Yixiao Wang<sup>3</sup>, Tim Wolfer<sup>3</sup>, <sup>1</sup>*Laser Zentrum Hannover e.V., Germany*, <sup>2</sup>*Hannoversches Zentrum für Optische Technologien, Germany*, <sup>3</sup>*Leibniz Universitaet Hannover, Institut fuer Transport- und Automatisierungstechnik, Germany*

8:40 Th2-0L-2

**Laser direct ablation for patterning printed wiring boards using ultrafast lasers and high speed beam delivery architectures**, Hisashi Matsumoto<sup>1</sup>, Mark A Unrath<sup>1</sup>, Haibin Zhang<sup>1</sup>, Robert F Hainsey<sup>1</sup>, <sup>1</sup>*Electro Scientific Industries, Inc., USA*

9:00 Th2-0L-3

**Ultra highspeed variable focus liquid lenses for use in laser micromachining applications**, M. Duocastella<sup>1</sup>, C. B. Arnold<sup>1</sup>, <sup>1</sup>*Princeton University, USA*

9:20 Th2-0L-4

**Optical systems and objective lenses for high brilliance laser sources - design and application results**, Peter Dr. Triebel<sup>1</sup>, Lutz Reichmann<sup>1</sup>, Hans-Juergen Feige<sup>1</sup>, Juergen Dr. Finster<sup>1</sup>, Matthias Bening<sup>1</sup>, Joerg Wunderlich<sup>1</sup>, Helmut Bernitzki<sup>1</sup>, Uwe Schuhmann<sup>1</sup>, <sup>1</sup>*JENOPTIK Optical Systems GmbH, Germany*

9:40 Th2-0L-5

**Arbitrary polarization distribution control of parallel femtosecond pulses with spatial light modulators**, Satoshi Hasegawa<sup>1</sup>, Yoshio Hayasaki<sup>1</sup>, <sup>1</sup>*Center for Optical Research and Education (CORE), Utsunomiya University, Japan*

10:00 *Coffee Break*

Day 3: Thursday, July 25

29. LPM

Room 3

Nano Fabrication

Chair: Aiko Narazaki

8:30 Th3-OL-1

**Speckle-free laser marking of metals with liquid-crystal-based spatial light modulator**, Krystian L. Wlodarczyk<sup>1</sup>, Jarno J. J. Kaakkunen<sup>2</sup>, Pati Vahimaa<sup>3</sup>, Duncan P. Hand<sup>1</sup>, <sup>1</sup>Heriot-Watt University, United Kingdom, <sup>2</sup>VTT Technical Research Centre of Finland, Finland, <sup>3</sup>University of Eastern Finland, Finland

8:50 Th3-OL-2

**Fabrication of plasmonic device by interfering femtosecond laser processing**, Yoshiki Nakata<sup>1</sup>, Yoshiki Matsuba<sup>1</sup>, Keiichi Murakawa<sup>1</sup>, Noriaki Miyanaga<sup>1</sup>, <sup>1</sup>Osaka University, Japan

9:10 Th3-OL-3 *Student*

**Optical trap assisted nanostructuring of glasses and polymeres**, Ulf Quentin<sup>1</sup>, Ilya Alexeev<sup>1</sup>, Michael Schmidt<sup>1</sup>, <sup>1</sup>Institute of Photonic Technologies, University of Erlangen-Nuremberg, Germany

9:30 Th3-OL-4

**Femtosecond laser nanoablation by enhanced optical field**, Mitsuhiro Terakawa<sup>1</sup>, Tatsuki Mitsuhashi<sup>1</sup>, Hisashi Shimizu<sup>1</sup>, Takuya Shinohara<sup>1</sup>, <sup>1</sup>School of Integrated Design Engineering, Keio University, Japan

9:50 Coffee Break

33. HPL 6

Room 4

Welding IV

8:30 Th4-IH-1 **Invited**

**New developments in filler wire assisted laser joining of aluminum**, Thomas Seefeld<sup>1</sup>, <sup>1</sup>BIAS - Bremer Institut fuer angewandte Strahltechnik GmbH, Germany

9:00 Th4-OH-2

**Laser narrow-gap welding of hot crack sensitive thick aluminum plates**, Renald Schedewy<sup>1</sup>, Eckhard Beyer<sup>1,2</sup>, Berndt Brenner<sup>1</sup>, Dirk Dittrich<sup>1</sup>, <sup>1</sup>Fraunhofer IWS, Germany, <sup>2</sup>University of Technology Dresden, Germany

9:20 Th4-OH-3

**Laser welding of Eco-Mg AZ 31 and Al 5052 alloys**, Min-Jung Kang<sup>1</sup>, Young-Nam Ahn<sup>1</sup>, Cheolhee Kim<sup>1</sup>, <sup>1</sup>Korea Institute of Industrial Technology, Korea

9:40 Th4-OH-4

**Laser-MIG welding process combination for thick wall applications of the aluminum alloy EN AW-6082-T6**, Oliver Seffer<sup>1</sup>, Rabi Lahdo<sup>1</sup>, Friedrich Schneider<sup>1</sup>, André Springer<sup>1</sup>, Stefan Kaierle<sup>1</sup>, <sup>1</sup>Laser Zentrum Hannover e.V., Germany

10:00 Coffee Break

22. LPM

Room 1

3D Fabrication I

Chair: Shoji Maruo

10:20 Th1-IL-5 **Invited**

**Integrated optics and photonic devices: Femtosecond laser direct write technique and laser written waveguides**, Michael J Withford<sup>1</sup>, Michael Withford<sup>1</sup>, <sup>1</sup>Macquarie University, Australia

10:50 Th1-IL-6 **Invited**

**Femtosecond laser micromachined dielectric crystals for photonic applications**, Feng Chen<sup>1</sup>, Javier Vazquez de Aldana<sup>2</sup>, <sup>1</sup>School of Physics, State Key Laboratory of Crystal Materials, Shandong University, China, <sup>2</sup>Laser Microprocessing Group, Universidad de Salamanca, Spain

11:20 Th1-OL-7 **Student**

**Low threshold whispering-gallery-mode Nd: Glass laser fabricated by femtosecond laser 3D direct writing**, Jintian Lin<sup>1</sup>, Jiangxin Song<sup>1</sup>, Fei He<sup>1</sup>, Yingxin Xu<sup>2</sup>, Wei Fang<sup>2</sup>, Ya Cheng<sup>1</sup>, Koji Sugioka<sup>3</sup>, Katsumi Midorikawa<sup>3</sup>, <sup>1</sup>State Key Laboratory of High Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, China, <sup>2</sup>State Key Laboratory of Modern Optical Instrumentation, Department of Optical Engineering, ZJU, China, <sup>3</sup>Laser Technology Laboratory, RIKEN - Advanced Science Institute, Japan

11:40 Th1-OL-8 **Student**

**Fabrications of an embedded microstructure for side-LED by laser direct write process**, Chen Yi Chian<sup>1</sup>, Pan Cheng Tang<sup>1,2</sup>, Wu Y. J.<sup>1</sup>, <sup>1</sup>Department of Mechanical and Electro-Mechanical Engineering, National Sun Yat-Sen University, Kaohsi, Taiwan, <sup>2</sup>Center for Nanoscience & Nanotechnology, National Sun Yat-Sen University; National Science Council C, Taiwan

26. LPM

Room 2

Ultrafast Laser  
—Surface Structuring—

Chair: Nadezhda M. Bulgakova

10:20 Th2-OL-6

**Self-repeating surface morphology on ultrashort laser pulse-treated vanadium surface**, Miklós Füle<sup>1,3</sup>, Judit Budai<sup>2</sup>, Zsolt Szkiva<sup>3</sup>, Koji Sugioka<sup>4</sup>, László Nánai<sup>1</sup>, <sup>1</sup>Department of General and Environmental Physics, University of Szeged, Hungary, <sup>2</sup>Department of Optics and Quantum Electronics, University of Szeged, Hungary, <sup>3</sup>High intensity Laser Laboratory, Department of Experimental Physics, University of Szeged, Hungary, <sup>4</sup>Laser Technology Laboratory, RIKEN, Japan

10:40 Th2-OL-7

**Microstructuring of steel using pico- and femtosecond laser pulses**, Steffen Weissmantel<sup>1</sup>, Peter Lickschat<sup>1</sup>, Joerg Schille<sup>1</sup>, Alexander Kratzsch<sup>1</sup>, Guenter Reisse<sup>1</sup>, <sup>1</sup>University of Applied Sciences Mittweida, Germany

11:00 Th2-OL-8

**Surface structuring with ultrafast Bessel beams**, Ilya Alexeev<sup>1</sup>, Kristian Cvecek<sup>2</sup>, Chuan T Yeoh<sup>1</sup>, Michael Schmidt<sup>1</sup>, <sup>1</sup>Friedrich-Alexander-University of Erlangen-Nuremberg, Germany, <sup>2</sup>Bayerisches Laserzentrum GmbH, Germany

11:20 Th2-OL-9

**Evolution of femtosecond laser induced surface structures at low number of pulses near the ablation threshold**, Juergen Reif<sup>1</sup>, Olga Varlamova<sup>1</sup>, <sup>1</sup>BTU Cottbus and Cottbus JointLab, Germany

11:40 Th2-OL-10

**Effect of multiple shots of femtosecond laser pulses on periodic surface nanostructuring**, Godai Miyaji<sup>1</sup>, Kenzo Miyazaki<sup>1</sup>, <sup>1</sup>Institute of Advanced Energy, Kyoto University, Japan

Poster II (Even-Numbered Posters)

12:00 Poster Session II and Exhibition (Main Hall A)

⌘ Lunch Time (up to 13:50)

## 30. LPM

Room 3

## Advanced Micro and Nano Processing

Chair: Philippe Delaporte

10:20 Th3-OL-5

**Laser interaction with plasmonic nanoantennas for controlled growth and fabrication of carbon nanotube bolometers**, M. Mahjouri-Samani<sup>1</sup>, Y.S. Zhou<sup>1</sup>, W. Xiong<sup>1</sup>, P. Hilger<sup>1</sup>, Y.F. Lu<sup>1</sup>, <sup>1</sup>*University of Nebraska - Lincoln, USA*

10:40 Th3-OL-6

**3D fabrication of biodegradable scaffolds for tissue engineering using Mask Projection Excimer laser StereoLithography**, Szabolcs Beke<sup>1</sup>, Ilaria Romano<sup>1</sup>, Alberto Diaspro<sup>1</sup>, Fernando Brandi<sup>1</sup>, <sup>1</sup>*Department of Nanophysics, Italian Institute of Technology, Italy*

11:00 Th3-OL-7

**CW diode laser for water assisted free form high quality cutting of silicon wafers**, Pablo Romero<sup>1</sup>, Nerea Otero<sup>1</sup>, Ivette Coto<sup>1</sup>, Cristina Leira<sup>1</sup>, Alejandro Gonzalez<sup>1</sup>, Armel Bahouka<sup>2</sup>, Frédéric Mermet<sup>2</sup>, <sup>1</sup>*AIMEN Technology Centre, Spain*, <sup>2</sup>*IREPA LASER, France*

11:20 Th3-OL-8 Student

**Miniaturized reaction chamber for optimized laser-assisted carbon nanotube growth**, Yoeri van de Burgt<sup>1</sup>, Wouter van Loon<sup>1</sup>, Rajesh Mandamparambil<sup>2</sup>, Yves Bellouard<sup>1</sup>, <sup>1</sup>*Eindhoven University of Technology, Netherlands*, <sup>2</sup>*Holst Centre/TNO – Netherlands Organization for Applied Scientific Research, Netherlands*

11:40 Th3-OL-9

**Preparation of superhard tetrahedral amorphous carbon, nano-crystalline diamond and cubic boron nitride films by means of excimer laser ablation and annealing**, Steffen Weissmantel<sup>1</sup>, Guenter Reisse<sup>1</sup>, Katja Guenter<sup>1</sup>, Rene Bertram<sup>1</sup>, Hagen Gruettner<sup>1</sup>, Maren Nieher<sup>1</sup>, Dirk Rost<sup>1</sup>, <sup>1</sup>*University of Applied Sciences Mittweida, Germany*

## 34. HPL 7

Room 4

## Welding V

Chair: Thomas Seefeld

10:30 Th4-IH-5 **Invited**

**Study on mosaic joint of CFRP composite using a Q-switch YAG laser**, Muneharu Kutsuna<sup>1</sup>, Hiroki Inoue<sup>1</sup>, K. Amano<sup>2</sup>, K. Ishikawa<sup>2</sup>, K. Kawata<sup>2</sup>, <sup>1</sup>*Advanced Laser Technology Research Center Co., Ltd., Japan*, <sup>2</sup>*Aichi Center for Industry and Science Technology, Japan*

11:00 Th4-OH-6 Student

**Microstructural and mechanical properties of Cu and Al dissimilar high-speed welding**, Su-Jin Lee<sup>1</sup>, Hiroshi Nakamura<sup>1</sup>, Yousuke Kawahito<sup>1</sup>, Seiji Katayama<sup>1</sup>, <sup>1</sup>*Joining and Welding Research Institute (JWRI), Osaka University, Japan*

11:20 Th4-OH-7

**Numerical simulation of laser brazing of silicon carbide and WC-Co alloy**, Kimiaki Nagatsuka<sup>1</sup>, Yoshihisa Sechi<sup>2</sup>, Ninshu Ma<sup>3</sup>, Kazuhiro Nakata<sup>1</sup>, <sup>1</sup>*Joining and Welding Research Institute, Osaka University, Japan*, <sup>2</sup>*Kagoshima Prefectural Institute of Industrial Technology, Japan*, <sup>3</sup>*JSOL Corporation, Japan*

11:40 Th4-OH-8

**Effect of contact force on formation behaviour of bubbles in SUS304 / PET dissimilar materials laser spot joining**, Yukio Miyashita<sup>1</sup>, Teppei Watanabe<sup>2</sup>, Yu Kurakake<sup>2</sup>, <sup>1</sup>*Nagaoka University of Technology, Japan*, <sup>2</sup>*Graduate Student, Nagaoka University of Technology, Japan*

## Poster II (Even-Numbered Posters)

12:00 Poster Session II and Exhibition (Main Hall A)

⌘ Lunch Time (up to 13:50)



23. LPM

Room 1

3D Fabrication II

Chair: Michael Withford

14:00 Th1-OL-9

**Selective, laser-induced etching of fused silica at high scan-speeds**, Martin Hermans<sup>1,2</sup>, Jens Gottmann<sup>1,2</sup>, Frank Riedel<sup>1</sup>, <sup>1</sup>*RWTH-Aachen University, Chair for Lasertechnology, Steinbachstraße 15, 52074 Aachen, Germany*, <sup>2</sup>*LightFab UG(haftungsbeschränkt), Steinbachstraße 15, 52074 Aachen, Germany*

14:20 Th1-OL-10

**Spiral-shaped piezoelectric energy harvester produced by three-dimensional molding process based on microstereolithography**, Shoji Maruo<sup>1</sup>, Kenji Sugiyama<sup>1</sup>, Kensaku Monri<sup>1</sup>, <sup>1</sup>*Yokohama National University, Japan*

14:40 Th1-OL-11

**Laser 3D nanostructuring of polymers: Mechanisms study and targeted applications**, Mangirdas Malinauskas<sup>1</sup>, Albertas Žukauskas<sup>1</sup>, Sima Reškštytė<sup>1</sup>, Gediminas Gervinskas<sup>2</sup>, Gediminas Seniutinas<sup>2</sup>, Valdas Sirutkaitis<sup>1</sup>, Saulius Juodkazis<sup>2</sup>, <sup>1</sup>*Laser Research Center, Department of Quantum Electronics, Vilnius University, Lithuania*, <sup>2</sup>*Micro-Photonics Centre, Engineering and Industrial Sciences Faculty, Swinburne University of Technology, Australia*

15:00 Th1-OL-12 **Student**

**Fabrication and applications of fiber tip microoptical components**, Albertas Žukauskas<sup>1</sup>, Vasileia Melissinaki<sup>2</sup>, Mangirdas Malinauskas<sup>1</sup>, Maria Farsari<sup>2</sup>, Roaldas Gadonas<sup>1</sup>, <sup>1</sup>*Department of Quantum Electronics, Vilnius University, Lithuania*, <sup>2</sup>*Institute of Electronic Structure and Laser, Foundation of Research and Technology Hellas, Greece*

15:20 Th1-OL-13

**Three-phase boundary enhancement in SOFC anodes by laser drilling technique**, Mindaugas Maciulevičius<sup>1</sup>, Brigita Abakevičienė<sup>2</sup>, Mindaugas Gedvilas<sup>1</sup>, Edvinas Navickas<sup>2</sup>, Sigitas Tamulevičius<sup>2</sup>, Gediminas Račiukaitis<sup>1</sup>, <sup>1</sup>*Center for Physical Sciences and Technology, Lithuania*, <sup>2</sup>*Institute of Materials Science of Kaunas University of Technology, Lithuania*

15:40 Coffee Break

27. LPM

Room 2

Ultrafast Laser  
—Nanotechnology—

Chair: Alexandre Mermillod-Blondin

14:00 Th2-OL-11

**Plasmonic modification of faraday effect in metal-ion-doped glasses irradiated with femtosecond laser**, Seisuke Nakashima<sup>1,2</sup>, Koji Sugioka<sup>2</sup>, Katsumi Midorikawa<sup>2</sup>, Kohki Mukai<sup>1</sup>, <sup>1</sup>*Yokohama National University, Japan*, <sup>2</sup>*RIKEN – Advanced Science Institute, Japan*

14:20 Th2-OL-12

**Seed-free synthesis of diamond patterns on femtosecond laser pretreated silicon substrates**, M. Wang<sup>1</sup>, Y.S. Zhou<sup>1</sup>, Z.Q. Xie<sup>1</sup>, Y. Gao<sup>1</sup>, X.N. He<sup>1</sup>, L. Jiang<sup>2</sup>, Y.F. Lu<sup>1</sup>, <sup>1</sup>*University of Nebraska - Lincoln, USA*, <sup>2</sup>*Beijing Institute of Technology, China*

14:40 Th2-OL-13

**Imprinting of nanogratings with femtosecond-laser-induced surface plasmon polaritons**, Kenzo Miyazaki<sup>1</sup>, Godai Miyaji<sup>1</sup>, <sup>1</sup>*Kyoto University, Japan*

15:00 Th2-OL-14

**Ti:sapphire laser ablation of silicon in different ambients**, Miklós Füle<sup>1,2</sup>, Anett Gárdián<sup>3</sup>, János Csontos<sup>3</sup>, Judit Budai<sup>3</sup>, Zsolt Tóth<sup>3</sup>, <sup>1</sup>*Department of General and Environmental Physics, University of Szeged, Hungary*, <sup>2</sup>*High intensity Laser Laboratory, Department of Experimental Physics, University of Szeged, Hungary*, <sup>3</sup>*Department of Optics and Quantum Electronics, University of Szeged, Hungary*

15:20 Th2-OL-15 **Student**

**Cell spreading on titanium dioxide film with periodic nanostructures produced by femtosecond laser irradiation**, Togo Shinonaga<sup>1</sup>, Masahiro Tsukamoto<sup>2</sup>, Yuichiro Ito<sup>1</sup>, Akiko Nagai<sup>3</sup>, Kimihiro Yamashita<sup>3</sup>, Takao Hanawa<sup>3</sup>, Nobuhiro Matsushita<sup>4</sup>, Xie Guoqiang<sup>5</sup>, Nobuyuki Abe<sup>2</sup>, <sup>1</sup>*Graduate School of Engineering, Osaka University, Japan*, <sup>2</sup>*Joining and Welding Research Institute, Osaka University, Japan*, <sup>3</sup>*Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Japan*, <sup>4</sup>*Materials and Structures Laboratory, Tokyo Institute of technology, Japan*, <sup>5</sup>*Institute for Materials Research, Tohoku University, Japan*

15:40 Coffee Break

## 31. LPM

Room 3

## Bio Applications

Chair: Yoichiro Hosokawa

14:00 Th3-IL-10 **Invited**

**Photothermal nanoblade for cell surgery and large cargo delivery**, Eric P. Y. Chiou<sup>1</sup>,  
<sup>1</sup>*Mechanical and Aerospace Engineering Department, University of California at Los Angeles, USA*

14:30 Th3-IL-11 **Invited**

**Plasmonic enhanced pulsed laser nanoprocessing and cell nanosurgery**, Michel Meunier<sup>1</sup>, Remi Lachaine<sup>1</sup>, Bastien St-Louis-Lalonde<sup>1</sup>, Etienne Boulais<sup>1</sup>, Jean-Jacques Lebrun<sup>2</sup>, <sup>1</sup>*Laser Processing and Plasmonic Laboratory, École Polytechnique de Montréal, Canada*, <sup>2</sup>*University McGill, Canada*

15:00 Th3-OL-12 **Student**

**Picosecond laser interaction with grass tissues**, Jaehun Kim<sup>1</sup>, Hyungson Ki<sup>1</sup>, <sup>1</sup>*Ulsan National Institute of Science and Technology, 1*

15:20 Th3-OL-13 **Student**

**Laser tool for single cell transfer**, Dominik Riester<sup>1</sup>, Alp Özmert<sup>1</sup>, Martin Wehner<sup>1</sup>, <sup>1</sup>*Fraunhofer ILT, Steinbachstr. 15, 52074 Aachen, Germany*

15:40 *Coffee Break*

## 35. HPL 8

Room 4

## Surface Treatment I

Chair: Muneharu Kutsuna

14:00 Th4-IH-9 **Invited**

**Laser heat treatment technologies for wear protection of steam turbine blades**, Steffen Bonss<sup>1</sup>, Berndt Brenner<sup>1</sup>, Frank Tietz<sup>1</sup>, Eckhard Beyer<sup>2</sup>, <sup>1</sup>*Fraunhofer IWS, Winterbergstrasse 28, 01277 Dresden, Germany*, <sup>2</sup>*TU Dresden, Institute of Manufacturing Technology, George-Baehr-Strasse 3c, 01069 Dresden, Germany*

14:30 Th4-OH-10 **Student**

**A study of laser heat treatability of steel sheets**, Sangwoo So<sup>1</sup>, Hyungson Ki<sup>1</sup>, <sup>1</sup>*Ulsan National Institute of Science and Technology, South Korea*

14:50 Th4-OH-11

**Formation of Fe<sub>34</sub>Co<sub>34</sub>B<sub>20</sub>Si<sub>5</sub>C<sub>3</sub>Nb<sub>4</sub> amorphous layer by using high power diode laser cladding**, Zhuguo LI<sup>1</sup>, Yanyan ZHU<sup>1</sup>, Yixiong WU<sup>1</sup>, <sup>1</sup>*School of Materials Science and Engineering, Shanghai Jiao Tong University, P.R. China*

15:10 Th4-OH-12

**Microstructure of MC-Fe composite layer on carbon steel by laser surface alloying**, Takuto Yamaguchi<sup>1</sup>, Hideki Hagino<sup>1</sup>, Mamoru Takemura<sup>1</sup>, Atsushi Nakahira<sup>2</sup>, <sup>1</sup>*Technology Research Institute of Osaka Prefecture, Japan*, <sup>2</sup>*Osaka Prefecture University, Japan*

15:30 *Coffee Break*

**24. Joint Special Session Room 1**

**Tailored Surfaces by Laser Additive Manufacturing**

Chair: Paul Denney

16:00 Th1-IJ-14 **Invited**

**Laser cladding in China: From fundamental research to industrial applications,** Minlin Zhong<sup>1</sup>, <sup>1</sup>*Tsinghua University, China*

16:30 Th1-IJ-15 **Invited**

**Repair of compressor airfoils by laser metal deposition and process monitoring with a CPC-system,** Marco Goebel<sup>1</sup>, R. Poprawe<sup>1</sup>, A. Gasser<sup>2</sup>, S. Mann<sup>2</sup>, <sup>1</sup>*RWTH-Aachen, Germany*, <sup>2</sup>*Fraunhofer Institute for Laser Technology, Germany*

17:00 Th1-IJ-16 **Invited**

**Cladding & heat treatment with high power, fibre-coupled, diode lasers,** Jeff Franks<sup>1</sup>, <sup>1</sup>*Laserline KK, Japan*

17:30 Th1-IJ-17 **Invited**

**High-rate laser deposition,** Eckhard Beyer<sup>1</sup>, Eckhard Beyer<sup>2</sup>, Steffen Nowotny<sup>1</sup>, <sup>1</sup>*Fraunhofer IWS Dresden, Germany*, <sup>2</sup>*Technische Universitaet Dresden, Germany*

**28. LPM**

**Room 2**

**Ultrafast Laser  
—Ablation—**

Chair: Kenzo Miyazaki

16:00 Th2-OL-16 **Student**

**Contrastive study on laser ablation of single-crystal silicon by 1030 nm femtosecond laser and 355 nm nanosecond laser,** Huan Yang<sup>1</sup>, Jun Duan<sup>1</sup>, Xiaoyan Zeng<sup>1</sup>, <sup>1</sup>*Huazhong University of Science and Technology, China*

16:20 Th2-OL-17

**Modification and machining on back surface of a silicon substrate by femtosecond laser pulses at 1552 nm,** Yoshiro Ito<sup>1</sup>, Hiroki Sakashita<sup>1</sup>, Ryusuke Suzuki<sup>1</sup>, Mitsuru Uewada<sup>1</sup>, Rie Tanabe<sup>1</sup>, <sup>1</sup>*Department of Mechanical Engineering, Nagaoka University of Technology, Japa*

16:40 Th2-OL-18

**Mechanism of selective removal of transparent conductive oxide layers: Femtosecond- vs. picosecond-laser pulse ablation,** Victor Matylytsky<sup>1</sup>, Juerg Aus der Au<sup>1</sup>, <sup>1</sup>*High Q Laser GmbH, Austria*

17:00 Th2-OL-19

**Highspeed laser micro processing using ultrashort laser pulses,** Joerg Schille<sup>1,2</sup>, Lutz Schneider<sup>1</sup>, Mathias Mueller<sup>1</sup>, Udo Loeschner<sup>1</sup>, Robby Ebert<sup>1</sup>, Nicholas Goddard<sup>2</sup>, Patricia Scully<sup>2</sup>, Horst Exner<sup>1</sup>, <sup>1</sup>*Laser Institute at the University of Applied Sciences Mittweida, Germany*, <sup>2</sup>*The University of Manchester, School of Chemical Engineering and Analytical Science, GB*

17:20 Th2-OL-20

**Ablation of CIGS thin-films by femtosecond laser with variable pulse duration,** Paulius Gecys<sup>1</sup>, Edgaras Markauskas<sup>1</sup>, Juozas Dudutis<sup>1</sup>, Gediminas Raciukaitis<sup>1</sup>, <sup>1</sup>*Center for Physical Sciences and Technology, Lithuania*

17:40 Th2-OL-21 **Student**

**Ultrashort pulsed laser cutting of intraocular lens polymers,** Johannes Heberle<sup>1</sup>, Florian Klämpfl<sup>1</sup>, Ilya Alexeev<sup>1</sup>, Michael Schmidt<sup>1</sup>, <sup>1</sup>*Institute of Photonic Technologies, University of Erlangen-Nürnberg, Germany*

18:00 Th2-OL-22

**Fabrication of gold nanoantennas for infrared near-field enhancement by fs-laser radiation,** Dirk Wortmann<sup>1</sup>, Martin Reininghaus<sup>1</sup>, Zhao Cao<sup>1</sup>, Thomas Taubner<sup>2</sup>, <sup>1</sup>*Lehrstuhl fuer Lasertechnik, RWTH Aachen University, Germany*, <sup>2</sup>*1. Phys. Institut 1A, RWTH Aachen University, Germany*



## 32. LPM

## Room 3

## Room 4

## Nanoparticle

Chair: Michel Meunier

16:00 Th3-OL-14

**Fabrication of spherical particles using laser-induced melting of submicron-sized materials**, Takeshi Tsuji<sup>1</sup>, Yuuma Higashi<sup>1</sup>, Masaharu Tsuji<sup>1</sup>, Hideki Fujiwara<sup>2</sup>, Yoshie Ishikawa<sup>3</sup>, Naoto Koshizaki<sup>4</sup>, <sup>1</sup>*Kyushu University, Japan*, <sup>2</sup>*Hokkaido University, Japan*, <sup>3</sup>*Kagawa University, Japan*, <sup>4</sup>*National Institute of Advanced Industrial Science and Technology, Japan*

16:20 Th3-OL-15

**Silver and gold clusters and nanostructures produced by pulsed laser ablation**, Alexander V. Bulgakov<sup>1</sup>, Sergey V. Starinski<sup>2</sup>, Anton B. Evtushenko<sup>2</sup>, Yuri G. Shukhov<sup>2</sup>, Lidiya S. Kibis<sup>3</sup>, Andrei I. Boronin<sup>3</sup>, Vladimir I. Zaikovskii<sup>3</sup>, <sup>1</sup>*School of Chemistry, University of Edinburgh, West Mains Road, EH9 3JJ, Scotland*, <sup>2</sup>*Kutateladze Institute of Thermophysics SB RAS, 1 Lavrentyev Ave., 630090 Novosibirsk, Russia*, <sup>3</sup>*Borshchov Institute of Catalysis SB RAS, 5 Lavrentyev Ave., 630090 Novosibirsk, Russia*

16:40 Th3-OL-16

**Optical properties of YAG:Ce nanoparticles prepared by laser ablation in liquid**, Hiroyuki Wada<sup>1</sup>, Noriyuki Tsuruoka<sup>1</sup>, Yasunori Inoue<sup>2</sup>, Tokuo Yodo<sup>3</sup>, Michikazu Hara<sup>2</sup>, Hajime Yamamoto<sup>4</sup>, Osamu Odawara<sup>1</sup>, <sup>1</sup>*Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Japan*, <sup>2</sup>*Materials & Structures Laboratory, Tokyo Institute of Technology, Japan*, <sup>3</sup>*Electronics, Information and Communication Engineering, Osaka Institute of Technology, Japan*, <sup>4</sup>*Professor Emeritus, Tokyo University of Technology, Japan*

17:00 Th3-OL-17 Student

**Determination of the effective refractive index of porous ITO layers**, Marcus Baum<sup>1</sup>, Ilya Alexeev<sup>1</sup>, Michael Schmidt<sup>1</sup>, <sup>1</sup>*Institute of Photonic Technologies, Friedrich-Alexander-University Erlangen-Nuremberg, Germany*

17:20 Th3-OL-18 Student

**Aligned ZnO nanorod arrays using electrospray ionization method to fabricated the ZnO seed layer**, Hung Kun Hao<sup>1</sup>, Pan Cheng Tang<sup>1,2</sup>, Z. H. Liu<sup>1,2,3</sup>, Wang W. C.<sup>1,2</sup>, Lee C. C.<sup>1,2</sup>, <sup>1</sup>*Department of Mechanical and Electro-Mechanical Engineering, National Sun Yat-Sen University, Kaohsi, Taiwan*, <sup>2</sup>*Center for Nanoscience & Nanotechnology, National Sun Yat-Sen University; National Science Council C, Taiwan*, <sup>3</sup>*Electronics and Optoelectronics Research Laboratories, Industrial Technology Research Institute, Hsi, Taiwan*

17:40 Th3-OL-19 Student

**Laser generation of small monodisperse gold nanoparticles in saline solution independent from ligands**, Lisa Gamrad<sup>1</sup>, Christoph Rehbock<sup>1</sup>, Stephan Barcikowski<sup>1</sup>, <sup>1</sup>*University of Duisburg-Essen and Center for Nanointegration Duisburg-Essen CENIDE, Germany*

Day 4: Friday, July 26

36. LPM SP3-1

Room 1

Ultrashort Pulsed Laser Processing toward Industrial Application I

Chair: Yasuhiro Okamoto

8:30 Fr1-IL-1 **Invited**

**Simultaneous multi-bit recording and driveless reading for permanent storage in fused silica**, Manabu Shiozawa<sup>1</sup>, Takao Watanabe<sup>1</sup>, Eriko Tatsu<sup>1</sup>, Mariko Umeda<sup>1</sup>, Toshiyuki Mine<sup>1</sup>, Yasuhiko Shimotsuma<sup>2</sup>, Masaaki Sakakura<sup>3</sup>, Miki Nakabayashi<sup>2</sup>, Kiyotaka Miura<sup>2</sup>, Koichi Watanabe<sup>1</sup>, <sup>1</sup>Central Research Laboratory, Hitachi, Ltd., Japan, <sup>2</sup>Department of Material Chemistry, Graduate School of Engineering, Japan, <sup>3</sup>Kyoto University Office of Society-Academia Collaboration for Innovation, Japan

9:00 Fr1-IL-2 **Invited**

**Prospects and requirements for industrialisation of ultrashort pulse laser technology**, Arnold Gillner<sup>1</sup>, Jens Holtkamp<sup>1</sup>, Stephan Eifel<sup>1</sup>, Malte Schulz-Ruhtenberg<sup>1</sup>, <sup>1</sup>Fraunhofer Institute for Laser Technology, Germany

9:30 Fr1-OL-3

**Novel fusion welding technology of Si/glass by USLP**, Isamu Miyamoto<sup>1,2</sup>, Yasuhiro Okamoto<sup>3</sup>, <sup>1</sup>Osaka University, Japan, <sup>2</sup>Erlangen Graduate School of Advanced Optical Technologies, Germany, <sup>3</sup>Okayama University, Japan

9:50 Fr1-OL-4

**3D micro structures in glass by in-volume selective laser-induced etching with high speed micro scanner**, Jens Gottmann<sup>1,2</sup>, Martin Hermans<sup>1,2</sup>, Jürgen Ortmann<sup>1,2</sup>, Nikolai Repiev<sup>1</sup>, Frank Riedel<sup>1</sup>, Ingomar Kelbassa<sup>1,3</sup>, Reinhart Poprawe<sup>1,3</sup>, <sup>1</sup>Lehrstuhl für Lasertechnik, RWTH Aachen University, Steinbachstrasse 15, 52074 Aachen, Germany, <sup>2</sup>LightFab UG (haftungsbeschränkt), Steinbachstrasse 15, 52074 Aachen, Germany, <sup>3</sup>Fraunhofer Institut für Lasertechnik, Steinbachstrasse 15, 52074 Aachen, Germany

10:10 Coffee Break

38. LPM

Room 2

Surface Modification I

Chair: Masayuki Okoshi

8:40 Fr2-OL-1

**Effect of laser patterning on properties of crystalline Si photovoltaic cells and substrates**, Antanas Vinčiūnas<sup>1</sup>, Bogdan Voisiat<sup>1</sup>, Gediminas Račiukaitis<sup>1</sup>, Irena Šimkienė<sup>1</sup>, Rasa Suzanovičienė<sup>1</sup>, Alfonsas Rėza<sup>1</sup>, Regina Mažeikienė<sup>1</sup>, <sup>1</sup>Center for Physical Sciences and Technology, Lithuania

9:00 Fr2-OL-2

**Passivation of silicon surface by laser rapid heating**, Toshiyuki Sameshima<sup>1</sup>, Hiroshi Abe<sup>1</sup>, Masahiko Hasumi<sup>1</sup>, Tomohisa Mizuno<sup>2</sup>, Naoki Sano<sup>3</sup>, <sup>1</sup>Tokyo University of Agriculture & Technology, Japan, <sup>2</sup>Kanagawa University, Japan, <sup>3</sup>Aurea Works Corporation, Japan

9:20 Fr2-OL-3 **Student**

**Laser texturing of surfaces in thin film silicon solar**, Tobias Knüttel<sup>1</sup>, Stefan Haas<sup>2</sup>, Stefan Bergfeld<sup>3</sup>, <sup>1</sup>IEK-5 Photovoltaics at Forschungszentrum Jülich GmbH and 4JET Technologies GmbH, Germany, <sup>2</sup>Institute of Energy and Climate Research (IEK-5) – Photovoltaics at Forschungszentrum Jülich GmbH, Germany, <sup>3</sup>4JET Technologies GmbH, Germany

9:40 Fr2-OL-4

**Analysis and improvement of electric failure for pulse laser annealing ITO thin film after wet etching**, Ching-Jen Lee<sup>1</sup>, Hsuan-Kai Lin<sup>2</sup>, Wei-Chen Hsu<sup>2</sup>, Chun-Han Li<sup>3</sup>, <sup>1</sup>National Sun Yat-Sen University, Taiwan, <sup>2</sup>National Pingtung University of Science and Technology, Taiwan, <sup>3</sup>Industrial Technology Research Institute South, Taiwan

10:00 Coffee Break

## Day 4: Friday, July 26

## 40. LPM

## Room 3

## UV, VUV lasers and Applications I

Chair: Yongfeng Lu

8:50 Fr3-IL-1 **Invited**

**Development of ultrashort pulsed VUV laser and its applications**, Masahito Katto<sup>1</sup>, Masanori Kaku<sup>2</sup>, Atushi Yokotani<sup>2</sup>, Kenzo Miyazaki<sup>3</sup>, Noriaki Miyanaga<sup>4</sup>, Shoichi Kubodera<sup>2</sup>, <sup>1</sup>*CRCC, University of Miyazaki, Japan*, <sup>2</sup>*Faculty of Engineering, University of Miyazaki, Japan*, <sup>3</sup>*Institute of Advanced Energy, Kyoto University, Japan*, <sup>4</sup>*Institute of Laser Engineering, Osaka University, Japan*

9:20 Fr3-OL-2 **Student**

**Longitudinally excited N<sub>2</sub> laser with high beam quality**, WenLong Gong<sup>1</sup>, Kazuyuki Uno<sup>1</sup>, Shunsuke Shitajima<sup>1</sup>, Tetsuya Akitsu<sup>1</sup>, Takahisa Jitsuno<sup>2</sup>, <sup>1</sup>*Interdisciplinary Graduate School of Medicine and Engineering, Univ. Yamanashi, Japan*, <sup>2</sup>*Institute of Laser Engineering, Osaka University, Japan*

9:40 Fr3-OL-3 **Student**

**Micromachining of polydimethylsiloxane using laser plasma soft X-rays**, Shintaro Fukami<sup>1</sup>, Shuichi Torii<sup>1</sup>, Tetsuya Makimura<sup>1</sup>, Kota Okazaki<sup>2</sup>, Daisuke Nakamura<sup>2</sup>, Akihiko Takahashi<sup>3</sup>, Tatsuo Okada<sup>2</sup>, Hiroyuki Niino<sup>4</sup>, Koichi Murakami<sup>1</sup>, <sup>1</sup>*Institute of Applied Physics, University of Tsukuba, Japan*, <sup>2</sup>*Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan*, <sup>3</sup>*Graduate School of Health Science, Kyushu University, Japan*, <sup>4</sup>*Research Institute for Innovation in Sustainable Chemistry, AIST, Japan*

10:00 Coffee Break

## 42. HPL 9

## Room 4

## Surface Treatment II

Chair: Alexander Kaplan

8:40 Fr4-OH-1

**Laser technologies in car body tool manufacturing**, Jan Hannweber<sup>1</sup>, Steffen Bonss<sup>1</sup>, Stefan Kuehn<sup>1</sup>, Udo Karsunke<sup>1</sup>, Dirk Poegen<sup>1</sup>, Berndt Brenner<sup>1</sup>, Eckhard Beyer<sup>2</sup>, <sup>1</sup>*Fraunhofer IWS, Winterbergstrasse 28, 01277 Dresden, Germany*, <sup>2</sup>*TU Dresden, Institute of Manufacturing Technology, George-Baehr-Strasse 3c, 01069 Dresden, Germany*

9:00 Fr4-OH-2 **Student**

**Dynamic observation of laser cladding phenomena with high speed video camera**, Nobuyuki Abe<sup>1</sup>, Daichi Tanigawa<sup>2</sup>, Masahiro Tsukamoto<sup>1</sup>, Yoshihiro Tatsumi<sup>3</sup>, Mikio Yoshihiro<sup>3</sup>, <sup>1</sup>*Joining and Welding Research Institute, Osaka University, Japan*, <sup>2</sup>*Graduate school of Engineering, Osaka University, Japan*, <sup>3</sup>*Osaka Fuji Corporation, Japan*

9:20 Fr4-OH-3

**Particles transport and bead forming in direct material deposition: Theory and experiment**, Dmitriy V Bedenko<sup>1</sup>, Alexander V Zaitsev<sup>1</sup>, Oleg B Kovalev<sup>1</sup>, <sup>1</sup>*Khristianovich Institute of Theoretical and Applied Mechanics SB RAS, Russia*

9:40 Fr4-OH-4

**Mechanism of formability extension in laser assisted shear forming of dual phase steels**, Pablo Romero<sup>1</sup>, Nerea Otero<sup>1</sup>, Jose Antonio Benito<sup>2,3</sup>, Pablo Rodriguez<sup>2,3</sup>, <sup>1</sup>*AIMEN - Technology Centre, Spain*, <sup>2</sup>*EUETIB (UPC), Spain*, <sup>3</sup>*Fundació CTM Centre Tecnològic, Spain*

10:00 Coffee Break

37. LPM SP3-2

Room 1

Ultrashort Pulsed Laser Processing toward Industrial Application II

Chair: Jens Holtkamp

10:30 Fr1-IL-5 **Invited**

**Latest ultra short pulsed laser technology for new materials, applications and industries,** Bastian Becker<sup>1</sup>, Christof Siebert<sup>2</sup>, Oliver Heckl<sup>2</sup>, Sascha Weiler<sup>3</sup>, <sup>1</sup>TRUMPF Corporation, Japan, <sup>2</sup>TRUMPF Laser- und Systemtechnik GmbH, Germany, <sup>3</sup>TRUMPF Inc., USA

11:00 Fr1-OL-6

**100-W output power, 50- $\mu$ J pulse energy femtosecond fiber amplifier for industrial micro-machining,** Franck Morin<sup>1</sup>, Yoann Zaouter<sup>1</sup>, Clemens Hoenninger<sup>1</sup>, Eric Mottay<sup>1</sup>, Brendan Dunne<sup>2</sup>, <sup>1</sup>Amplitude Systemes, France, <sup>2</sup>NEXCIS Photovoltaic Technology, France

11:20 Fr1-OL-7

**Formation of internal modified line with high aspect ratio in sapphire by sub-nanosecond pulsed fiber laser,** Yasuhiro Okamoto<sup>1</sup>, Tomohiro Takekuni<sup>1</sup>, Akira Okada<sup>1</sup>, <sup>1</sup>Okayama University, 1

11:40 Fr1-OL-8

**High density perforation of thin Al-foils with ultra short pulse lasers,** Claudia Hartmann<sup>1</sup>, Nelli Hambach<sup>1</sup>, Michael Jüngst<sup>1</sup>, Stephan Keller<sup>1</sup>, Jens Holtkamp<sup>1</sup>, Arnold Gillner<sup>1</sup>, <sup>1</sup>Fraunhofer Institute for Lasertechnology, Steinbachstr. 15, 52074 Aachen, Germany

12:00 Lunch Time

39. LPM

Room 2

Surface Modification II

Chair: Tetsuya Makimura

10:30 Fr2-OL-5 **Student**

**Minimization limits of laser induced back-side ablation for the series connection of thin-film silicon solar modules,** Bugra Turan<sup>1</sup>, Stefan Haas<sup>1</sup>, <sup>1</sup>Forschungszentrum Jülich GmbH, Institut für Energie- und Klimaforschung 5 - Photovoltaik, Germany

10:50 Fr2-OL-6 **Student**

**Effects of laser peening parameters on plastic deformation of crystal state controlled carbon steels,** Miho Tsuyama<sup>1</sup>, Kohei Mizuta<sup>1</sup>, Yukio Miyamoto<sup>1</sup>, Toshiya Shibayanagi<sup>2</sup>, Masahiro Tsukamoto<sup>3</sup>, Hitoshi Nakano<sup>1</sup>, <sup>1</sup>Interdisciplinary Graduate School of Science and Engineering, Kinki University, Japan, <sup>2</sup>Faculty of Engineering, Toyama University, Japan, <sup>3</sup>Joining and Welding Research Institute, Osaka University, Japan

11:10 Fr2-OL-7 **Student**

**Picosecond-laser treatment of graphene containing films used in electro-chemical sensors,** Romualdas Trusovas<sup>1</sup>, Gediminas Račiukaitis<sup>1</sup>, Raimonda Celiešiūtė<sup>2</sup>, Rasa Pauliukaite<sup>2</sup>, <sup>1</sup>Department of Laser Technologies, Center for Physical Sciences and Technology, Lithuania, <sup>2</sup>Department of Nanoengineering, Center for Physical Sciences and Technology, Lithuania

11:30 Fr2-OL-8 **Student**

**Laser micro texturing at tool surface for reduction in cutting force,** Hiroki Kiyota<sup>1</sup>, Fumihiro Itoigawa<sup>1</sup>, Takashi Nakamura<sup>1</sup>, <sup>1</sup>Nagoya Institute of Technology, Japan

11:50 Lunch Time

## 41. LPM

Room 3

## UV, VUV lasers and Applications II

Chair: Masahito Katto

10:30 Fr3-0L-4

**Femtosecond-laser-driven-cluster-based plasma source for submicron soft X-ray and multicharged ions imaging of nano-thickness objects.**, A. Faenov<sup>2</sup>, T. Pikuz<sup>1</sup>, Y. Fukuda<sup>1</sup>, S. Jinno<sup>1</sup>, H. Sakaki<sup>1</sup>, M. Kanasaki<sup>4</sup>, H. Kotaki<sup>1</sup>, S. Bulanov<sup>1</sup>, A. Pirozhkov<sup>1</sup>, A. Yogo<sup>1</sup>, Y. Hayashi<sup>1</sup>, I. Skobelev<sup>2</sup>, Y. Kato<sup>3</sup>, M. Kando<sup>1</sup>, K. Kondo<sup>1</sup>,  
<sup>1</sup>Quantum Beam Science Directorate, Japan Atomic Energy Agency, Japan, <sup>2</sup>Joint Institute for High Temperatures, Russian Academy of Sciences, Russia, <sup>3</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>4</sup>Graduate School of Maritime Sciences, Kobe University, Japan

10:50 Fr3-0L-5

**A breakthrough 40 W UV laser for micromachining**, Rajesh S Patel<sup>1</sup>, James Bovatsek<sup>1</sup>, Ashwini Tamhankar<sup>1</sup>, <sup>1</sup>Spectra Physics, 3635 Peterson Way, Santa Clara, CA 95054, USA, USA

11:10 Fr3-0L-6

**F<sub>2</sub> laser induced surface modification of iron thin films into corrosion resistant property**, Masayuki Okoshi<sup>1</sup>, Yuta Awaiharu<sup>1</sup>, Tsugito Yamashita<sup>2</sup>, Narumi Inoue<sup>1</sup>, <sup>1</sup>National Defense Academy, Japan, <sup>2</sup>Kanto Gakuin University, Japan

11:30 Fr3-0L-7

**Practical aspects of surface generated third harmonic for highly precise beam-workpiece alignment**, Kristian Cvecek<sup>1</sup>, Johannes Strauss<sup>3</sup>, Ilya Alexeev<sup>3</sup>, Isamu Miyamoto<sup>2</sup>, Michael Schmidt<sup>3</sup>,  
<sup>1</sup>Bayerisches Laserzentrum GmbH, Germany, <sup>2</sup>Osaka University, Japan, <sup>3</sup>Chair of Photonic Technologies, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany

11:50 Lunch Time

## 43. HPL 10

Room 4

## Cutting and Drilling

Chair: Hiroto Yamaoka

10:30 Fr4-0H-5

**Experimental measurement of absorptance during laser cutting of steel**, Koji Hirano<sup>1</sup>, Remy Fabbro<sup>2</sup>, <sup>1</sup>Nippon Steel & Sumitomo Metal Corporation, Japan, <sup>2</sup>PIMM Laboratory, CNRS-Arts et Métiers ParisTech, France

10:50 Fr4-0H-6

**Laser cutting of carbon fiber reinforced plastics (CFRP) by IR and UV lasers irradiation**, Hiroyuki Niino<sup>1,2</sup>, Yoshizo Kawaguchi<sup>1,2</sup>, Tadatake Sato<sup>1,2</sup>, Aiko Narazaki<sup>1,2</sup>, Ryoza Kurosaki<sup>2</sup>, Mayu Muramatsu<sup>1,2</sup>, Yoshihisa Harada<sup>1,2</sup>, Koji Wakabayashi<sup>1,3</sup>, Takahiro Nagashima<sup>1,3</sup>, Zyunpei Kase<sup>1,3</sup>, Masafumi Matsushita<sup>1,4</sup>, Koichi Furukawa<sup>1,4</sup>, Michiteru Nishino<sup>1,5</sup>, <sup>1</sup>Advanced Laser and Process Technology Research Association (ALPROT), Japan, <sup>2</sup>National Institute of Advanced Industrial Science and Technology (AIST), Japan, <sup>3</sup>MIYACHI CORPORATION, Japan, <sup>4</sup>Shin Nippon Koki Co., Ltd., Japan, <sup>5</sup>Mitsubishi Chemical Corporation, Japan

11:10 Fr4-0H-7

**CO<sub>2</sub> laser hole drilling of fused silica: Experiment and modeling**, Barada Nayak<sup>1</sup>, Ravindra Akarapu<sup>1</sup>, Joel Carberry<sup>1</sup>, Anping Liu<sup>1</sup>,  
<sup>1</sup>Corning Inc., USA

11:30 Fr4-0H-8

**Through hole forming method using pulse UV laser**, Susumu Nakamura<sup>1</sup>, Kaoru Itagaki<sup>2</sup>, Naohiko Soma<sup>3</sup>, <sup>1</sup>Nagaoka National College of Technology, Japan, <sup>2</sup>Itagaki Kinzoku Co., Ltd., Japan, <sup>3</sup>Wavelock Advanced Technology Co., Ltd., Japan

11:50 Lunch Time

## 44. LPM/HPL Joint Session *Room 1*

### Advanced Laser Processing

Chair: Kazuyoshi Itoh

13:30 Fr1-IJ-9 **Invited**

**Angle- and absorptivity-modulation at inclined wavy processing fronts**, Alexander F. H. Kaplan<sup>1</sup>,  
<sup>1</sup>Luleå University of Technology, Sweden

14:00 Fr1-OJ-10

**Laser high-speed and high-quality cutting of CFRP sheets, and laser direct joining of CFRP to metal**, Seiji Katayama<sup>1</sup>, Kwang-Woon Jung<sup>1</sup>, Yousuke Kawahito<sup>1</sup>,  
<sup>1</sup>Joining and Welding Research Institute, Osaka University, Japan

14:20 Fr1-OJ-11

**Multifunctional biochips fabricated by hybrid femtosecond laser 3D micromachining**, Dong Wu<sup>1</sup>, Si Zhu Wu<sup>1</sup>, Jian Xu<sup>1</sup>, Koji Sugioka<sup>1</sup>, Katsumi Midorikawa<sup>1</sup>,  
<sup>1</sup>RIKEN, Japan

14:40 Fr1-IJ-12 **Invited**

**Interface driven response to 150 femtosecond irradiation of very thin films: Thresholds, nanoparticles, and a little bit of shock**, Steven Yalisove<sup>1</sup>, Ben Torralva<sup>2</sup>, Keegan Schrider<sup>1</sup>, Michael Aber<sup>1</sup>, Ryan Murphy<sup>3</sup>,  
<sup>1</sup>Department of Materials Science and Engineering, University of Michigan, 2300 Hayward St., Ann Arbor, USA, <sup>2</sup>Atmospheric, Oceanic and Space Sciences, University of Michigan, 2455 Hayward St., Ann Arbor, MI 481, USA, <sup>3</sup>Sandia National Labs, Albuquerque, NM, USA

15:10 Fr1-IJ-13 **Invited**

**Picosecond laser precision hole drilling with no taper and flexible shape**, Xinbing Liu<sup>1</sup>,  
<sup>1</sup>Panasonic Boston Laboratory, 1

## *Room 1*

### Closing

Chair: Hiroyuki Niino

15:40 **Outstanding Awards**

**Closing Remark**

16:00 *close*



# Poster Session

The authors for odd- and even-numbered posters should be present in front of their posters on July 24 and July 25, respectively.

July 24, 10:30 Short Presentation for Poster Session I & II (Room 1)

July 24, 12:00 Poster Session I and Exhibition (Main Hall A)

July 25, 12:00 Poster Session II and Exhibition (Main Hall A)

P-1

**Laser ablation of carbon fiber reinforced plastics: Laser-ionization TOF mass spectrometric study**, Aiko Narazaki<sup>1,2</sup>, Tadatake Sato<sup>1,2</sup>, Yoshizo Kawaguchi<sup>1,2</sup>, Hiroyuki Niino<sup>1,2</sup>, <sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST), Japan, <sup>2</sup>Advanced Laser and Process Technology Research Association (ALPROT), Japan

P-2 **Student**

**A study on the laser drilling monitoring program of via holes using vision camera and searching algorithm**, Hyun-Jin Kim<sup>1</sup>, Soon-Kon Kim<sup>1</sup>, Byoung-Deok Choi<sup>1</sup>, Kwang-Ryul Kim<sup>1</sup>, Hong-Jin Park<sup>2</sup>, <sup>1</sup>College of Information and Communication Engineering, SungKyunKwan University, Suwon 440-746, Korea, "South Korea", <sup>2</sup>LTS, 38-13, Ojeon-dong, Uiwang-si, Gyeonggi-do, 437-817, Korea, "South Korea"

P-3

**Towards realization of imaging power meter~radiometric caribration of CCD camera beam profilers~**, Takayuki Numata<sup>1</sup>, <sup>1</sup>National Metrology Institute of Japan (NMIJ), Japan

P-4 **Student**

**The optical coupling structure of a fiber-optics Mach-Zehnder interferometer by CO<sub>2</sub> laser irradiation**, Chien-Hsing Chen<sup>1</sup>, Chih-Yu Hsu<sup>2</sup>, Jian-Neng Wang<sup>3</sup>, Pei-Hsing Huang<sup>4</sup>, Chih-To Wang<sup>5</sup>, Ying-Ting Chen<sup>5</sup>, Tai-Huei Wei<sup>1</sup>, Yi-Cheng Hsu<sup>2</sup>, Lai-Kwan Chau<sup>5</sup>, Wei-Te Wu<sup>2</sup>, <sup>1</sup>Department of Physics, National Chung Cheng University, Taiwan, <sup>2</sup>Department of Biomechatronics Engineering, National Pingtung University of Science and Technology, Taiwan, <sup>3</sup>Department of Construction Engineering, National Yunlin University of Science and Technology, Taiwan, <sup>4</sup>Department of Mechanical Engineering, National Pingtung University of Science and Technology, Taiwan, <sup>5</sup>Department of Chemistry and Biochemistry, National Chung Cheng University, Taiwan

P-5 **Student**

**Microfabrication with vibration assisted femtosecond laser system**, Ji-Wook Yoon<sup>1,2</sup>, Won-Suk Choi<sup>1</sup>, Jae-Gu Kim<sup>1</sup>, Kyoung-Hyun Whang<sup>1</sup>, Jung-Kyu Park<sup>3</sup>, Sung-Hak Cho<sup>1,2</sup>, <sup>1</sup>KIMM (Korea Institute of Machinery and Materials) nano machining laboratory, Korea, <sup>2</sup>Department of Nano-Mechatronics, UST (University of Science and Technology)-KIMM, Korea, <sup>3</sup>Laser System Industrialization Center, Jeonnam Technology, Korea

P-6

**Modification of embedded gratings in flexible polymeric sheets using femtosecond laser irradiation**, Jung-Kyu Park<sup>1</sup>, Ji-Wook Yoon<sup>2</sup>, Sung-Sik Woo<sup>1</sup>, Yong-Woo Yi<sup>1</sup>, Sung-Hak Cho<sup>2</sup>, <sup>1</sup>Laser System Industrialization Center, Republic of Korea, <sup>2</sup>Korea Institute of Machinery and Materials (KIMM), Republic of Korea

P-7

**Deposition of TiO<sub>2</sub> films for photocatalytic reaction on glass/quartz and polyethylene substrates by laser induced forward transfer**, Masateru Saito<sup>1</sup>, Satoshi Kurumi<sup>1</sup>, Kaoru Suzuki<sup>1</sup>, <sup>1</sup>Department of Electrical Engineering College of Science & Technology Nihon University, Japan

P-8

**Direct patterning of photomasks using picosecond laser pulse induced chromium oxidation**, Mizue Mizoshiri<sup>1</sup>, Kimihiro Ozaki<sup>1</sup>, <sup>1</sup>National Institute of Advanced Industrial Science and Technology (AIST), Japan

P-9

**Low-threshold surface modification of metals irradiated by picosecond soft X-ray laser pulses: Observation and modeling**, T Pikuz<sup>1</sup>, A Faenov<sup>2</sup>, M Ishino<sup>1</sup>, S Starikov<sup>2</sup>, V Stegailov<sup>2</sup>, G Norman<sup>3</sup>, V Fortov<sup>2</sup>, I Skobelev<sup>2</sup>, N Inogamov<sup>5</sup>, V Zhakhovsky<sup>6</sup>, S Tamotsu<sup>4</sup>, M Tanaka<sup>1</sup>, N Hasegawa<sup>1</sup>, M Nishikino<sup>1</sup>, T Kaihori<sup>1</sup>, M Kando<sup>1</sup>, T Kawachi<sup>1</sup>,  
<sup>1</sup>Quantum Beam Science Directorate, Japan Atomic Energy Agency, Kizugawa, Kyoto 619-0215, Japan, <sup>2</sup>Joint Institute for High Temperatures, Russian Academy of Sciences, Moscow 125412, Russia, <sup>3</sup>Moscow Institute of Physics and Technology, Dolgoprudnui, Moscow region, 141700, Russia, <sup>4</sup>Graduate School of Humanities and Science, Nara Women's University, Nara 630-8506, Japan, <sup>5</sup>Landau Institute for Theoretical Physics, Russian Academy of Science, Chernogolovka, Moscow region, Russia, <sup>6</sup>6 Department of Physics, University of South Florida, Tampa, Florida 33620, USA

P-10 **Student**

**Surface laser ablation of polymethyl-methacrylate using 1027 nm femtosecond laser**, Camilo Florian Baron<sup>1</sup>, <sup>1</sup>Universitat de Barcelona, Spain

P-11

**On ripple formation in various metals and super-hard tetrahedral amorphous carbon films in consequence of femtosecond laser irradiation**, Steffen Weissmantel<sup>1</sup>, Manuel Pfeiffer<sup>1</sup>, Hagen Gruettner<sup>1</sup>, Andy Engel<sup>1</sup>, Katja Guenter<sup>1</sup>, Franka Marquardt<sup>1</sup>, Guenter Reisse<sup>1</sup>, <sup>1</sup>University of Applied Sciences Mittweida, Germany

P-12

**Fast cutting and drilling of transparent materials via femtosecond laser filamentation**, Simas Butkus<sup>1</sup>, Domas Paipulas<sup>1</sup>, Romualdas Sirutkaitis<sup>2</sup>, Eugenijus Gaižauskas<sup>1</sup>, Valdas Sirutkaitis<sup>1</sup>, <sup>1</sup>Laser Research Center, Vilnius University, Lithuania, <sup>2</sup>Institute of Biochemistry, Vilnius University, Lithuania

P-13 **Student**

**Study of the ablation of transparent materials with near-infrared femtosecond laser**, Francesc Caballero Lucas<sup>1</sup>, Camilo Florian Baron<sup>1</sup>, Juan Marcos Fernández Pradas<sup>1</sup>, José Luis Morenza Gil<sup>1</sup>, Pere Serra Coromina<sup>1</sup>, <sup>1</sup>Universitat de Barcelona, Spain

P-14

**Formation of periodic micro/nano-holes in borosilicate glass by femtosecond laser pulses**, Md. Shamim Ahsan<sup>1,2</sup>, Yoon-Young Kwon<sup>3</sup>, Ik-Bu Sohn<sup>2</sup>, Young-Chul Noh<sup>2</sup>, Man Seop Lee<sup>4</sup>, <sup>1</sup>Electronics and Communication Engineering Discipline, School of Science, Engineering and Technology, Bangladesh, <sup>2</sup>Advanced Photonics Research Institute (APRI), Gwangju Institute of Science and Technology (GIST), South Korea, <sup>3</sup>Energy Materials Lab, Samsung Corning Precision Materials, South Korea, <sup>4</sup>Department of Electrical Engineering, Korea Advanced Institute of Science and Technology (KAIST), South Korea

P-15 **Student**

**Time-resolved micro-Raman measurement of temperature dynamics during high-repetition-rate ultrafast laser microprocessing**, Fumiya Hashimoto<sup>1</sup>, Richter Sören<sup>2</sup>, Stefan Nolte<sup>2</sup>, Yasuyuki Ozeki<sup>1</sup>, Kazuyoshi Itoh<sup>1</sup>, <sup>1</sup>Osaka University, Japan, <sup>2</sup>Friedrich-Schiller-University, Germany

P-16 **Student**

**Two-wavelength time-resolved interference observations of femtosecond-laser-induced phenomena**, Shin-ichi Fukuda<sup>1</sup>, Kazuki Toyoda<sup>1</sup>, Yoshinori Hashizume<sup>1</sup>, Yoshio Hayasaki<sup>1</sup>, <sup>1</sup>Center for Optical Research and Education (CORE), Utsunomiya University, Japan

P-17 **Student**

**Holographic laser sweep using femtosecond fiber laser**, Kazuki Sakuma<sup>1</sup>, Satoshi Hasegawa<sup>1</sup>, Hidetomo Takahashi<sup>2</sup>, Michiharu Ota<sup>2</sup>, Yoshio Hayasaki<sup>1</sup>, <sup>1</sup>Center for Optical Research and Education (CORE), Utsunomiya University, Japan, <sup>2</sup>AISIN SEIKI CO., LTD., Japan

P-18 **Student**

**Double-clad waveguide fabrication and ring-shaped laser generation in Nd:YAG crystal by femtosecond laser micromachining**, Hongliang Liu<sup>1</sup>, Feng Chen<sup>1</sup>, Javier Rodríguez Vázquez de Aldana<sup>2</sup>, <sup>1</sup>School of Physics, Shandong University, China, <sup>2</sup>Departamento Física Aplicada, Facultad de Ciencias, Universidad de Salamanca, Spain



P-19 **Student**

**Micromachining of PMMA using laser plasma soft X-rays for fabrication of 3D molds in a micrometer scale**, Nobuhiko Sugiura<sup>1</sup>, Shuichi Torii<sup>1</sup>, Tetsuya Makimura<sup>1</sup>, Yoshiyuki Ichinosawa<sup>2</sup>, Kouta Okazaki<sup>3</sup>, Daisuke Nakamura<sup>3</sup>, Akihiko Takahashi<sup>4</sup>, Tatsuo Okada<sup>3</sup>, Hiroyuki Niino<sup>5</sup>, Kouichi Murakami<sup>1</sup>, <sup>1</sup>*Institute of Applied Physics, University of Tsukuba, Japan*, <sup>2</sup>*Optics Precision Co., Ltd., Japan*, <sup>3</sup>*Graduate school of Information Science and Electrical Engineering, Kyushu University, Japan*, <sup>4</sup>*Graduate school of Medical Sciences, Kyushu University, Japan*, <sup>5</sup>*ISC, National Institute of Advanced Industrial Science and Technology (AIST), Japan*

## P-20

**Effect of laser irradiation on properties of YSZ and GDC thin films**, Mindaugas Maciulevičius<sup>1</sup>, Brigita Abakevičienė<sup>2</sup>, Jolita Sakaliūnienė<sup>2</sup>, Kęstutis Šlapikas<sup>2</sup>, Gediminas Račiukaitis<sup>1</sup>, Sigitas Tamulevičius<sup>2</sup>, <sup>1</sup>*Center for Physical Sciences and Technology, Lithuania*, <sup>2</sup>*Institute of Material Science, Kaunas University of Technology, Lithuania*

## P-21

**Laser surface modification for rapidly oxide layer formation on Ti-6Al-4V**, Ting-Fu Hong<sup>1</sup>, Kuan-Ping Chi<sup>1</sup>, Hsuan-Kai Lin<sup>1</sup>, Yii-Der Wu<sup>2</sup>, <sup>1</sup>*National Pingtung University of Science and Technology, Taiwan*, <sup>2</sup>*Metal Industries Research & Development Centre, Taiwan*

## P-22

**Fabrication of micro 3D pattern array using laser direct write lithography system**, Sumio Nakahara<sup>1</sup>, Kyoji Matsushima<sup>2</sup>, <sup>1</sup>*Kansai University, Dept. of Mechanical Engineering, Japan*, <sup>2</sup>*Kansai University, Dept. of Electrical Engineering, Japan*

## P-23

**Fabrication of micron and submicron period metal reflection gratings by imprinting technique**, Balint Kiss<sup>1</sup>, Roland Flender<sup>1</sup>, Csaba Vass<sup>1</sup>, <sup>1</sup>*Department of Optics and Quantum Electronics, University of Szeged, Hungary*

P-24 **Student**

**Reduction of produced heat affected zone of CFRP by controlling atmospheric**, Kazuki NAKAI<sup>1</sup>, Tatsuya Nariyama<sup>2</sup>, Masahiro Tsukamoto<sup>3</sup>, Tatsuya Miyagawa<sup>1</sup>, Kenjiro Takahashi<sup>3</sup>, Shinichiro Masuno<sup>3</sup>, Nobuyuki Abe<sup>3</sup>, <sup>1</sup>*Graduate School of Engineering, Osaka University, Japan*, <sup>2</sup>*Graduate School of Science and Engineering, Kinki University, Japan*, <sup>3</sup>*Joining and Welding Research Institute, Osaka University, Japan*

P-25 **Student**

**Ultraviolet nanosecond laser cutting of carbon fiber reinforced plastic for reduction of heat affected zone**, Tatsuya Nariyama<sup>1</sup>, Kazuki Nakai<sup>2</sup>, Masahiro Tsukamoto<sup>3</sup>, Kazuya Miyagawa<sup>1</sup>, Shinichiro Masuno<sup>3</sup>, Kenjiro Takahashi<sup>3</sup>, Hitoshi Nakano<sup>1</sup>, Nobuyuki Abe<sup>3</sup>, <sup>1</sup>*Graduate School of Science and Engineering, Kinki University, Japan*, <sup>2</sup>*Graduate School of Engineering, Osaka University, Japan*, <sup>3</sup>*Joining and Welding Research Institute, Osaka University, Japan*

P-26 **Student**

**Off-axis laser beam cutting utilizing a reluctance force lens drive actuator**, Yoshihiro Morimoto<sup>1</sup>, Tadahiko Shinshi<sup>2</sup>, Shuichi Fujikawa<sup>3</sup>, Naoyuki Nakamura<sup>3</sup>, Takahiro Nakai<sup>3</sup>, Teruaki Fukuoka<sup>3</sup>, <sup>1</sup>*Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Japan*, <sup>2</sup>*Precision and Intelligence Laboratory, Tokyo Institute of Technology, Japan*, <sup>3</sup>*Mitsubishi Electric Corporation, Japan*

P-27 **Student**

**Glass marking by longitudinally excited CO<sub>2</sub> laser with short laser pulse**, Kazuma Dobashi<sup>1</sup>, Kazuyuki Uno<sup>1</sup>, Tetsuya Akitsu<sup>1</sup>, Takahisa Jitsuno<sup>2</sup>, <sup>1</sup>*University of Yamanashi, Japan*, <sup>2</sup>*ILE, Osaka University, Japan*

## P-28

**Hydrogen absorption property of nano-Pd/zeolite composite fabricated using a novel laser ablation**, Teppei Nishi<sup>1</sup>, Akio Itoh<sup>1</sup>, Naoko Takahashi<sup>1</sup>, Noritomo Suzuki<sup>1</sup>, Satoru Kosaka<sup>1</sup>, Tatsumi Hioki<sup>1</sup>, Tomoyoshi Motohiro<sup>1</sup>, <sup>1</sup>*Toyota Central R&D Labs., Inc., Japan*

P-29 **Student**

**The growth of NdF<sub>3</sub> and YbF<sub>3</sub> thin films by pulsed laser deposition for VUV detectors**, Takayuki Tsuji<sup>1</sup>, Tatsuya Ishimaru<sup>1</sup>, Shingo Ono<sup>1</sup>, Yuui Yokota<sup>2</sup>, Takayuki Yanagida<sup>3</sup>, Akira Yoshikawa<sup>2</sup>, <sup>1</sup>*Nagoya Institute of Technology, Japan*, <sup>2</sup>*Institute for Materials Research, Tohoku University, Japan*, <sup>3</sup>*Kyushu Institute of Technology, Japan*

P-30

---

**Preparation of superhard tetrahedral amorphous carbon, nano-crystalline diamond and cubic boron nitride films by means of excimer laser ablation and annealing**, Steffen Weissmantel<sup>1</sup>, Guenter Reisse<sup>1</sup>, Katja Guenter<sup>1</sup>, Rene Bertram<sup>1</sup>, Hagen Gruettner<sup>1</sup>, Maren Nieher<sup>1</sup>, Dirk Rost<sup>1</sup>, <sup>1</sup>*University of Applied Sciences Mittweida, Germany*

P-31 **Student**

---

**3D waveguide fabrication in PDMS polymer biochip by femtosecond laser for mechanism study of symbiosis**, Nobuaki Ishikawa<sup>1</sup>, Yasutaka Hanada<sup>1</sup>, Ikuko Ishikawa<sup>2</sup>, Koji Sugioka<sup>3</sup>, Katsumi Midorikawa<sup>3</sup>, <sup>1</sup>*Hirosaki Univ., Japan*, <sup>2</sup>*RIKEN BSI, Japan*, <sup>3</sup>*RIKEN ASI, Japan*

P-32

---

**New method to analyze time evolution of intercellular adhesion force by femtosecond laser-induced impulse**, Takanori Iino<sup>1</sup>, Man Hagiyama<sup>2</sup>, Tadahide Furuno<sup>3</sup>, Akihiko Ito<sup>2</sup>, Yoichiroh Hosokawa<sup>1</sup>, <sup>1</sup>*Nara Institute of Science and Technology, Japan*, <sup>2</sup>*Kinki University, Japan*, <sup>3</sup>*Aichi Gakuin University, Japan*

P-33

---

**Laser welding of aluminium and copper sheets for lithium-ion batteries**, Tae-Soon Park<sup>1</sup>, Cheolhee Kim<sup>1</sup>, <sup>1</sup>*Korea Institute of Industrial Technology, South Korea*

# Author Index

- A—
- Abakevičienė, Brigita [Th1-OL-13](#),  
[P-20](#)
- Abe, Hiroshi [Fr2-OL-2](#)
- Abe, Nobuyuki [Th2-OL-15](#),  
[Fr4-OH-2](#), [P-24](#), [P-25](#)
- Abe, Yohei [Tu4-OH-4](#)
- Abels, Peter [Tu4-OH-9](#)
- Abere, Michael [Fr1-IJ-12](#)
- Ahn, Young-Nam [Th4-OH-3](#)
- Ahsan, Md. Shamim [P-14](#)
- Ailuno, Julie [Tu2-OL-2](#)
- Akarapu, Ravindra [Fr4-OH-7](#)
- Akitsu, Tetsuya [Fr3-OL-2](#), [P-27](#)
- Alesnikov, Aleksandr [Tu3-OL-3](#)
- Alexander, Zaitsev V [Tu4-OH-5](#)
- Alexeev, Ilya [Th3-OL-3](#),  
[Th2-OL-8](#), [Th2-OL-21](#),  
[Th3-OL-17](#), [Fr3-OL-7](#)
- Allen, Chris [We4-OH-12](#)
- Alloncle, Anne-Patricia [Tu2-OL-2](#)
- Amano, K. [Th4-IH-5](#)
- Amend, Philipp [Tu1-OL-10](#)
- Amiri Naini, Crispin [We1-IL-1](#)
- Arnold, C. B. [Th2-OL-3](#)
- ASADA, Takuto [Tu3-OL-1](#)
- Asai, Taiga [We2-OL-12](#)
- Audouard, Eric [We2-OL-2](#),  
[We2-OL-7](#), [We2-OL-8](#)
- Aus der Au, Juerg [Th2-OL-18](#)
- Awaiharu, Yuta [Fr3-OL-6](#)
- B—
- Baba, Motoyoshi [Tu2-OL-3](#)
- Bahouka, Armel [Th3-OL-7](#)
- Ballerini, Gaia [We4-OH-9](#)
- Barcikowski, Stephan [We1-OL-10](#),  
[We1-OL-12](#), [We1-OL-13](#),  
[Th3-OL-19](#)
- Baubeau, Emmanuel [We2-OL-2](#)
- Baum, Marcus [Tu1-OL-10](#),  
[Th3-OL-17](#)
- Beckemper, Stefan [Tu1-OL-6](#)
- Becker, Bastian [Tu4-OH-1](#),  
[Fr1-IL-5](#)
- Bedenko, Dmitriy V [Fr4-OH-3](#)
- Beke, Szabolcs [Th3-OL-6](#)
- Belaud, Vanessa [We2-OL-7](#),  
[We2-OL-8](#)
- Bellouard, Yves [Th3-OL-8](#)
- Benayoun, Stéphane [We2-OL-6](#)
- Benayoun, Stéphane [We2-OL-8](#)
- Bening, Matthias [Th2-OL-4](#)
- Benito, Jose Antonio [Fr4-OH-4](#)
- Beresna, Martynas [We2-OL-13](#)
- Bergfeld, Stefan [Fr2-OL-3](#)
- Bernitzki, Helmut [Th2-OL-4](#)
- Bertram, Rene [Th3-OL-9](#), [P-30](#)
- Beyer, Eckhard [Th4-OH-2](#),  
[Th4-IH-9](#), [Th1-IJ-17](#),  
[Fr4-OH-1](#)
- Bigerelle, Maxence [We2-OL-8](#)
- Biver, Emeric [Tu2-OL-2](#)
- Bizi-Bandoki, Pavel [We2-OL-6](#)
- Blackburn, Jon [We4-OH-12](#)
- Boarino, Lucas [We1-OL-7](#)
- Boley, Meiko [We4-OH-3](#)
- Bonse, Jörn [We1-OL-6](#)
- Bonss, Steffen [Th4-IH-9](#),  
[Fr4-OH-1](#)
- Booth, Martin J [Tu1-IL-13](#)
- Boronin, Andrei I. [Th3-OL-15](#)
- Boulais, Etienne [Th3-IL-11](#)
- Bovatssek, James [Fr3-OL-5](#)
- Brandi, Fernando [Th3-OL-6](#)
- Brenner, Berndt [Th4-OH-2](#),  
[Th4-IH-9](#), [Fr4-OH-1](#)
- Briand, Francis [We4-OH-9](#)
- Brisset, Francois [Tu3-OL-4](#)
- Brock, Christian [Tu4-OH-7](#)
- Budai, Judit [Th2-OL-6](#),  
[Th2-OL-14](#)
- Buividas, Ričardas [Tu3-OL-6](#)
- Bulanov, S. [Fr3-OL-4](#)
- Bulgakov, Alexander V. [Th3-OL-15](#)
- Bulgakova, Nadezhda M. [We3-OL-10](#)
- Butkus, Simas [P-12](#)
- C—
- C., Lee C. [Th3-OL-18](#)
- C., Wang W. [Th3-OL-18](#)
- Caballero Lucas, Francesc [P-13](#)
- Cai, Chuang [We4-OH-1](#)
- Cao, Zhao [Th2-OL-22](#)
- Carberry, Joel [Fr4-OH-7](#)
- Celiesiūtė, Raimonda [Fr2-OL-7](#)
- Chang, C. M. [We1-IL-5](#)
- Chang, C. P. [We3-OL-12](#)
- Chang, Chia-Hao [Tu3-OL-5](#)
- Chang, Chou-Yuan-Yuan [Tu3-OL-5](#)
- Chau, Lai-Kwan [P-4](#)
- Chadževskis, Gediminas [Tu3-OL-3](#)
- Chen, Chien-Hsing [Tu4-OH-3](#), [P-4](#)
- Chen, Feng [Th1-IL-6](#), [P-18](#)
- Chen, Guorong [Tu3-OL-4](#)
- Chen, Huai-Yi [Tu3-OL-5](#)
- Chen, J. K. [We3-OL-12](#)
- Chen, Jenq-Shyong [Tu2-OL-7](#)
- Chen, W.F. [Tu1-OL-12](#)
- Chen, Wei Qiang [We1-OL-11](#)
- Chen, Y. L. [We1-IL-5](#)
- Chen, Yanbin [We4-OH-1](#)
- Chen, Ying-Ting [P-4](#)
- Cheng, C. W. [We3-OL-12](#)
- Cheng, Chung-Wei [Tu2-OL-7](#)
- Cheng, Guanghua [We2-OL-15](#)
- Cheng, Ji-Yen [Tu3-OL-5](#)
- Cheng, Wei-Jen [Tu4-OH-2](#)
- Cheng, Y.-H. [We1-IL-5](#)
- Cheng, Ya [We2-OL-4](#), [Th1-OL-7](#)
- Chi, Kuan-Ping [P-21](#)
- Chian, Chen Yi [Th1-OL-8](#)
- Chichkov, Boris N. [Tu2-IL-5](#)
- Chien, Chih-Wei [Tu2-OL-7](#)
- Chiou, Eric P. Y. [Th3-IL-10](#)
- Cho, Sung-Hak [P-5](#), [P-6](#)
- Choi, Byoung-Deok [P-2](#)
- Choi, Hae Woon [We3-OL-15](#)
- Choi, Won-Suk [P-5](#)
- Chung, K. S. [We1-IL-5](#)
- Compagnini, Giuseppe [We1-OL-12](#)
- Coto, Ivette [Th3-OL-7](#)
- Csontos, János [Th2-OL-14](#)
- Cvecek, Kristian [We3-OL-1](#),  
[We3-OL-2](#), [We2-OL-11](#),  
[Th2-OL-8](#), [Fr3-OL-7](#)
- D—
- D'Amico, Ciro [We2-OL-15](#)
- Dahmen, Martin [We4-OH-11](#)
- De Giacomo, Alessandro [We1-OL-12](#)
- De Leo, Natalia [We1-OL-7](#)
- Delaporte, Philippe [Tu2-OL-2](#),  
[We1-OL-7](#)
- Deng, Chun [We3-OL-11](#)
- Denney, Paul [Tu1-PL-2](#)
- Diaspro, Alberto [Th3-OL-6](#)
- Dittrich, Dirk [Th4-OH-2](#)
- Dobashi, Kazuma [P-27](#)
- Doi, Yuichiro [We4-OH-2](#)
- Dr. Finster, Juergen [Th2-OL-4](#)
- Dr. Triebel, Peter [Th2-OL-4](#)
- Duan, Jun [Th2-OL-16](#)
- Dudutis, Juozas [Th2-OL-20](#)
- Dunming, Liao [We4-OH-10](#)
- Dunne, Brendan [Fr1-OL-6](#)
- Duocastella, M. [Th2-OL-3](#)
- E—
- Ebert, Robby [Th2-OL-19](#)
- Eifel, Stephan [Fr1-IL-2](#)
- Engel, Andy [We1-OL-8](#), [P-11](#)
- Engelhardt, Sascha [We1-OL-2](#)
- Evtushenko, Anton B. [Th3-OL-15](#)
- Exner, Horst [Th2-OL-19](#)
- Eyama, Takashi [Tu2-OL-3](#)
- F—
- Fabbro, Remy [Fr4-OH-5](#)
- Faenov, A [P-9](#)
- Faenov, A. [Fr3-OL-4](#)
- Faisst, Birgit [We3-OL-13](#)
- Fan, Chaxing [Tu3-OL-4](#)
- Fang, Wei [Th1-OL-7](#)
- Farsari, Maria [Tu3-IL-9](#),  
[Th1-OL-12](#)
- Feige, Hans-Juergen [Th2-OL-4](#)
- Fernández Pradas, Juan Marcos [P-13](#)
- Fernández-Pradas, Juan Marcos [Tu2-IL-1](#)
- Flender, Roland [P-23](#)
- Florian Baron, Camilo [P-10](#), [P-13](#)
- Fortov, V [P-9](#)
- Franks, Jeff [Th1-IJ-16](#)
- Franzka, Steffen [We1-IL-1](#)

- Fujikawa, Shuichi P-26  
 Fujiwara, Hideki Th3-OL-14  
 Fukami, Shintaro Fr3-OL-3  
 Fukuda, Naoaki We2-OL-1  
 Fukuda, Shin-ichi P-16  
 Fukuda, Y. Fr3-OL-4  
 Fukuoka, Teruaki P-26  
 Füle, Miklós Th2-OL-6, Th2-OL-14  
 Furukawa, Koichi Fr4-OH-6  
 Furuno, Tadahide P-32
- G—
- Gadonas, Roaldas Th1-OL-12  
 Gaizauskas, Eugenijus P-12  
 Gamrad, Lisa Th3-OL-19  
 Gao, X.Y Tu1-OL-12  
 Gao, Xiangdong Tu4-OH-8  
 Gao, Y. Th2-OL-12  
 Gárdián, Anett Th2-OL-14  
 Gasser, A. Th1-IJ-15  
 Gecys, Paulius Th2-OL-20  
 Gedvilas, Mindaugas Th1-OL-13  
 Gervinskas, Gediminas Th1-OL-11  
 Gillner, Arnold Tu1-OL-6, We3-OL-4, Fr1-IL-2, Fr1-OL-8  
 Goddard, Nicholas Th2-OL-19  
 Goebel, Marco Th1-IJ-15  
 Gong, WenLong Fr3-OL-2  
 Gonzalez, Alejandro Th3-OL-7  
 Gottmann, Jens Th1-OL-9, Fr1-OL-4  
 Graf, Thomas We4-OH-3  
 Grigory, Ermolaev V Tu4-OH-5  
 Grisard, Arnuaud We1-OL-4  
 Grojo, David We1-OL-7  
 Gruettner, Hagen We1-OL-8, Th3-OL-9, P-11, P-30  
 Guenter, Katja We1-OL-8, Th3-OL-9, P-11, P-30  
 Guoqiang, Xie Th2-OL-15  
 Gurin, Aleksey Tu4-OH-10
- H—
- Haas, Stefan Fr2-OL-3, Fr2-OL-5  
 Hagino, Hideki Th4-OH-12  
 Hagiyama, Man P-32  
 Hainsey, Robert F Th2-OL-2  
 Hambach, Nelli Fr1-OL-8  
 Han, Xingfeng We4-OH-11  
 Hanada, Yasutaka P-31  
 Hanawa, Takao Th2-OL-15  
 Hand, Duncan P. Th3-OL-1  
 Hannweber, Jan Fr4-OH-1  
 Hao, Hung Kun Th3-OL-18  
 Hara, Michikazu Th3-OL-16  
 Harada, Kousuke Tu1-OL-4  
 Harada, Yoshihisa Fr4-OH-6  
 Hartmann, Claudia Tu1-OL-6, Fr1-OL-8  
 Hartmann, Nils We1-IL-1  
 Hasegawa, N P-9  
 Hasegawa, Noboru Tu2-OL-3  
 Hasegawa, Satoshi Th2-OL-5, P-17  
 Hashimoto, Fumiya P-15
- Hashizume, Yoshinori P-16  
 Hasumi, Masahiko Fr2-OL-2  
 Hayasaki, Yoshio Th2-OL-5, P-16, P-17  
 Hayashi, Y. Fr3-OL-4  
 He, Fei We2-OL-4, Th1-OL-7  
 He, X.N. Th2-OL-12  
 He, Xuan Tu3-OL-4  
 Heberle, Johannes Th2-OL-21  
 Heckl, Oliver Fr1-IL-5  
 Heider, Andreas We4-OH-3  
 Hentschel, Oliver Tu1-OL-10  
 Herman, Peter R. Tu1-OL-9  
 Hermans, Martin Th1-OL-9, Fr1-OL-4  
 Higashi, Yuuma Th3-OL-14  
 Higashihata, Mitsuhiro Tu1-OL-4, We3-OL-8  
 Hilger, P. Th3-OL-5  
 Hilton, Paul We4-OH-12  
 Hioki, Tatsumi P-28  
 Hirano, Koji Fr4-OH-5  
 Hirano, Yusuke Tu2-OL-3  
 Hitoshi, Tokura Th1-OL-1  
 Hoenninger, Clemens We2-OL-5, Fr1-OL-6  
 Höhm, Sandra We1-OL-6  
 Holtkamp, Jens Tu1-OL-6, Fr1-IL-2, Fr1-OL-8  
 Hong, M.H Tu1-OL-12  
 Hong, Ming Hui We1-OL-11  
 Hong, Ting-Fu P-21  
 Hosokawa, Yoichiroh P-32  
 Hsu, Chih-Yu P-4  
 Hsu, Wei-Chen Fr2-OL-4  
 Hsu, Yi-Cheng Tu4-OH-2, P-4  
 Hu, M.F Tu1-OL-12  
 Hu, W Tu1-OL-12  
 Huang, Pei-Hsing P-4  
 Huis in 't Veld, A. J. We3-OL-14  
 Huis in't Veld, A.J. Tu3-OL-7  
 Hung, Shang-Chao Tu4-OH-2
- I—
- Ibrahimkutty, Shyjumon We1-OL-13  
 Ichinosawa, Yoshiyuki P-19  
 Ieda, Mirai We3-OL-5  
 Iijima, Yasuhiro We3-IL-7  
 Iino, Takanori P-32  
 Ikenoue, Hiroshi Tu1-OL-4, We3-OL-8, Th1-OL-2  
 Inogamov, N P-9  
 Inoue, Hiroki Th4-IH-5  
 Inoue, Narumi Fr3-OL-6  
 Inoue, Yasunori Th3-OL-16  
 Ishiguro, Yuki We2-OL-1  
 Ishikawa, Ikuko P-31  
 Ishikawa, K. Th4-IH-5  
 Ishikawa, Nobuaki P-31  
 Ishikawa, Yoshie We1-IL-9, Th3-OL-14  
 Ishimaru, Tatsuya P-29  
 Ishino, M P-9  
 Itagaki, Kaoru Fr4-OH-8  
 Ito, Akihiko P-32  
 Ito, Yoshiro Tu2-OL-8, Th2-OL-17
- Ito, Yuichiro Th2-OL-15  
 Itoh, Akihiko We4-OH-6  
 Itoh, Akio P-28  
 ITOH, Kazuyoshi Tu3-OL-1  
 Itoh, Kazuyoshi P-15  
 Itoigawa, Fumihiko We2-OL-9, Fr2-OL-8  
 Izumi, Teruo We3-IL-7
- J—
- J., Wu Y. Th1-OL-8  
 Ji, Wei We1-OL-11  
 Jia, TianQing We1-OL-3  
 Jia, Tianqing Tu1-OL-7, We2-OL-3  
 Jiang, L. Th2-OL-12  
 Jianxin, Zhou We4-OH-10  
 Jinno, S. Fr3-OL-4  
 Jitsuno, Takahisa Fr3-OL-2, P-27  
 Jung, Kwang-Woon Fr1-OJ-10  
 Jüngst, Michael Fr1-OL-8  
 Juodkazis, Saulius Tu3-OL-6, Th1-OL-11
- K—
- Kaakkunen, Jarno J. J. Th3-OL-1  
 Kaakkunen, Jarno J.J. Tu1-OL-5  
 Kadoi, Kota We4-OH-4, We4-IH-5  
 Kaieler, Stefan Th4-OH-4  
 Kaihori, T P-9  
 Kaihori, Takeshi Tu2-OL-3  
 Kaku, Masanori Fr3-IL-1  
 Kanasaki, M. Fr3-OL-4  
 Kancleris, Žilvinas Tu3-OL-3  
 Kando, M P-9  
 Kando, M. Fr3-OL-4  
 Kang, Chung Yun We4-OH-13, We4-OH-14  
 Kang, Min-Jung Th4-OH-3  
 Kao, Tsung Sheng We1-OL-11  
 Kaplan, Alexander F. H. Fr1-IJ-9  
 Karsunke, Udo Fr4-OH-1  
 Kase, Zyunpei Fr4-OH-6  
 Katayama, Seiji Tu4-OH-8, We4-OH-2, Th4-OH-6, Fr1-OJ-10  
 Kato, Y. Fr3-OL-4  
 Katou, Yukiko We1-IL-9  
 Katto, Masahito Fr3-IL-1  
 Kawachi, T P-9  
 Kawachi, Tetsuya Tu2-OL-3  
 Kawaguchi, Yoshizo Tu3-OL-8, Fr4-OH-6, P-1  
 Kawahito, Yousuke We4-OH-2, Th4-OH-6, Fr1-OJ-10  
 Kawata, K. Th4-IH-5  
 Kazansky, Peter We2-OL-13  
 Kelbassa, Ingomar Fr1-OL-4  
 Keller, Stephan Fr1-OL-8  
 Kherani, Nazir P. Tu1-OL-9  
 Ki, Hyungson We3-OL-6, We3-OL-11, Th3-OL-12, Th4-OH-10  
 Kibis, Lidiya S. Th3-OL-15  
 Kil, Sang Cheol We4-IH-7  
 Kim, Cheolhee Th4-OH-3, P-33

- Kim, Hyun-Jin P-2  
Kim, Jae-Gu P-5  
Kim, Jaehun Th3-OL-12  
Kim, Jong Do We4-IH-7  
Kim, Kwang-Ryul P-2  
Kim, Soon-Kon P-2  
Kim, Young Sik We4-IH-7  
Kiss, Balint Tu1-OL-11, P-23  
Kiss, Takanobu We3-IL-7  
Kitagawa, Akikazu Tu4-OH-4  
Kiyota, Hiroki Fr2-OL-8  
Klämpfl, Florian Tu4-OH-7, Th2-OL-21  
Kling, Rainer We2-OL-5  
Klingebiel, Benjamin We1-IL-1  
Knüttel, Tobias Fr2-OL-3  
Koch, Lothar Tu2-IL-5  
Kogel-Hollacher, Markus Tu4-IH-6  
Konda, Osamu We2-OL-9  
Kondo, K. Fr3-OL-4  
Kong, Jong Pan We4-OH-13, We4-OH-14  
Kosaka, Satoru P-28  
Koshizaki, Naoto We1-IL-9, Th3-OL-14  
Kotaki, H. Fr3-OL-4  
Kovalev, Oleg Tu4-OH-10  
Kovalev, Oleg B Fr4-OH-3  
Kratzsch, Alexander Th2-OL-7  
Krüger, Jörg We1-OL-6  
Kubodera, Shoichi Fr3-IL-1  
Kudriasov, Viaceslav Tu2-IL-6  
Kuehn, Stefan Fr4-OH-1  
Kumar, Kitty Tu1-OL-9  
Kurakake, Yu Th4-OH-8  
Kurosaki, Ryoza Tu3-OL-8, Fr4-OH-6  
Kurumi, Satoshi P-7  
Kutsuna, Muneharu Th4-IH-5  
Kwon, Min Suck We4-OH-13, We4-OH-14  
Kwon, Yoon-Young P-14
- L—
- Laakso, Petri Tu1-OL-5  
Lachaine, Remi Th3-IL-11  
Lahdo, Rabi Th4-OH-4  
Lallier, Eric We1-OL-4  
Lancry, Matthieu Tu3-OL-2, Tu3-OL-4, We2-OL-13  
Laus, M We1-OL-7  
Lebrun, Jean-Jacques Th3-IL-11  
Lee, Ching-Jen Fr2-OL-4  
Lee, Kenneth K.C. Tu1-OL-9  
Lee, Man Seop P-14  
Lee, Su-Jin Th4-OH-6  
Lee, Young Min We3-OL-15  
Lefebvre, Philippe We4-OH-9  
Leira, Cristina Th3-OL-7  
Li, Chun-Han Fr2-OL-4  
Li, Jianzhao Tu1-OL-9  
Li, Liqun We4-OH-1  
LI, Zhuguo Th4-OH-11  
Liao, Yang We2-OL-4  
Lickschat, Peter Th2-OL-7  
Lin, Hsuan-Kai Fr2-OL-4, P-21  
Lin, Jintian We2-OL-4, Th1-OL-7  
Lindner, Stefan We4-OH-11  
Lippert, Thomas K. Tu3-IL-10  
Liu, Anping Fr4-OH-7  
Liu, Hongliang P-18  
Liu, JuKun We1-OL-3  
Liu, Qiming Tu3-OL-4  
Liu, Xinbing Fr1-IJ-13  
Liu, Z. H. Th3-OL-18  
Loeschner, Udo Th2-OL-19  
Lohse, D. Tu3-OL-7  
Lopez, John We2-OL-5  
Lu, Y.F. Th3-OL-5, Th2-OL-12  
Luo, Ching-Ying Tu4-OH-3  
Luzius, Severin We3-OL-13
- M—
- Ma, Ninshu Th4-OH-7  
Maciulevičius, Mindaugas Th1-OL-13, P-20  
Mahjouri-Samani, M. Th3-OL-5  
Makimura, Tetsuya Fr3-OL-3, P-19  
Malinauskas, Mangirdas Th1-OL-11, Th1-OL-12  
Mandamparambil, Rajesh Th3-OL-8  
Mann, S. Th1-IJ-15  
Markauskas, Edgaras Th2-OL-20  
Marquardt, Franka We1-OL-8, P-11  
Maruo, Shoji Th1-OL-10  
Masuno, Shinichiro P-24, P-25  
Mathieu, Mareike We1-IL-1  
Matsuba, Yoshiki Th3-OL-2  
Matsumoto, Hisashi Th2-OL-2  
Matsushima, Kyoji P-22  
Matsushita, Masafumi Fr4-OH-6  
Matsushita, Nobuhiro Th2-OL-15  
Matylitsky, Victor Th2-OL-18  
Maclair, Cyril We2-OL-2  
Mazeikienė, Regina Fr2-OL-1  
Mehlmann, Benjamin We3-OL-4  
Melissinaki, Vasileia Th1-OL-12  
Melninkaitis, Andrius Tu2-IL-6  
Menzel, Heiko Tu2-OL-4  
Menzel, Andreas We1-OL-13  
Merk, Vivian We1-OL-10  
Mermet, Frédéric Th3-OL-7  
Mermillod-Blondin, Alexandre Tu2-OL-4  
Meshcheryakov, Yuri P. We3-OL-10  
Messina, Gabriele C. We1-OL-12  
Meunier, Michel Th3-IL-11  
Midorikawa, Katsumi Tu1-PL-1, We2-OL-4, We3-OL-3, We2-OL-14, Th1-OL-7, Th2-OL-11, Fr1-OJ-11, P-31  
Minami, Yasuo Tu2-OL-3  
Mine, Toshiyuki Fr1-IL-1  
Mitsuhashi, Tatsuki Th3-OL-4  
Mitsui, Kenji We4-OH-4  
Miura, Kiyotaka We2-OL-1, We2-OL-12, Fr1-IL-1  
Miyagawa, Kazuya P-25  
Miyagawa, Tatsuya P-24  
Miyaji, Godai Th2-OL-10, Th2-OL-13  
Miyamoto, Isamu We3-OL-1, We3-OL-2, We2-OL-11, Fr1-OL-3, Fr3-OL-7  
Miyamoto, Yukio Fr2-OL-6  
Miyanaga, Noriaki Th3-OL-2, Fr3-IL-1  
Miyashita, Yukio Th4-OH-8  
Miyazaki, Kenzo Th2-OL-10, Th2-OL-13, Fr3-IL-1  
Mizeikis, Vygantas Tu3-OL-6  
Mizoshiri, Mizue P-8  
Mizuno, Tomohisa Fr2-OL-2  
Mizuta, Kohei Fr2-OL-6  
Monri, Kensaku Th1-OL-10  
Morenza Gil, José Luis P-13  
Morenza, José Luis Tu2-IL-1  
Morimoto, Yoshihiro P-26  
Morin, Franck Fr1-OL-6  
Morita, Toshimasa Tu2-OL-3  
Motohiro, Tomoyoshi P-28  
Mottay, Eric We2-OL-5, Fr1-OL-6  
Mousavi, Mansoureh Zarei Tu3-OL-5  
Mueller, Mathias Th2-OL-19  
Mukai, Kohki Th2-OL-11  
Murakami, Koichi Fr3-OL-3  
Murakami, Kouichi P-19  
Murakami, Masanao Th1-OL-3  
Murakami, Tomoaki We2-OL-10  
Murakawa, Keiichi Th3-OL-2  
Muramatsu, Mayu Fr4-OH-6  
Muraoka, Yuki Tu1-OL-4  
Murata, Yuichiro We4-OH-6  
Murphy, Ryan Fr1-IJ-12
- N—
- Nagai, Akiko Th2-OL-15  
Nagashima, Takahiro Fr4-OH-6  
Nagatsuka, Kimiaki Th4-OH-7  
Naithani, Sanjeev We1-OL-4  
Nakabayashi, Miki Fr1-IL-1  
Nakahara, Sumio P-22  
Nakahira, Atsushi Th4-OH-12  
NAKAI, Kazuki P-24  
Nakai, Kazuki P-25  
Nakai, Takahiro P-26  
Nakamura, Daisuke Tu1-OL-4, We3-OL-8, Th1-OL-2, Fr3-OL-3, P-19  
Nakamura, Hiroshi Th4-OH-6  
Nakamura, Naoyuki P-26  
Nakamura, Susumu Fr4-OH-8  
Nakamura, Takashi Fr2-OL-8  
Nakamura, Tsuyoshi Tu4-OH-1  
Nakano, Hitoshi Fr2-OL-6, P-25  
Nakao, Shihomi Tu1-OL-4  
Nakashima, Seisuke Th2-OL-11  
Nakata, Kazuhiro Tu4-OH-4, Th4-OH-7  
Nakata, Yoshiki Tu1-OL-4, Th3-OL-2  
NAKAZUMI, Masaya Tu3-OL-1  
Nánai, László Th2-OL-6  
Narazaki, Aiko Tu3-OL-8, Fr4-OH-6, P-1



- Nariyama, Tatsuya P-24, P-25  
 Navickas, Edvinas Th1-0L-13  
 Nayak, Barada Fr4-0H-7  
 Nguyen, Thao Thi Phuong Tu2-0L-8  
 Nieher, Maren Th3-0L-9, P-30  
 Niino, Hiroyuki Tu3-0L-8, Fr3-0L-3, Fr4-0H-6, P-1, P-19  
 Niki, Katsusuke We4-0H-9  
 Nishi, Teppei P-28  
 Nishikino, M P-9  
 Nishikino, Masaharu Tu2-0L-3  
 Nishino, Michiteru Fr4-0H-6  
 Nishiyama, Hiroaki We3-0L-9  
 Nogami, Jun Tu1-0L-9  
 Noh, Young-Chul P-14  
 Nolte, Stefan P-15  
 Norman, G P-9  
 Nowotny, Steffen Th1-IJ-17  
 Numata, Takayuki P-3
- O—  
 Odawara, Osamu Th3-0L-16  
 Oh, Myeong Hwan We4-0H-13, We4-0H-14  
 OHMURA, Etsuji Tu3-0L-1  
 Ohmura, Etsuji We2-0L-10, Th1-0L-3  
 Okada, Akira Fr1-0L-7  
 Okada, Tatsuo Tu1-0L-4, We3-0L-8, Th1-0L-2, Fr3-0L-3, P-19  
 Okamoto, Shintaro We3-0L-9  
 Okamoto, Yashuhiro Fr1-0L-3  
 Okamoto, Yasuhiro Fr1-0L-7  
 Okazaki, Kota We3-0L-8, Fr3-0L-3  
 Okazaki, Kouta P-19  
 Okoshi, Masayuki Fr3-0L-6  
 Oleg, Kovalev B Tu4-0H-5  
 Olowinsky, Alexander We3-0L-4  
 Ono, Motoshi Th1-IL-4  
 Ono, Shingo We2-0L-9, We3-0L-5, P-29  
 Ortman, Jürgen Fr1-0L-4  
 Ota, Michiharu We2-0L-9, P-17  
 Otero, Nerea Th3-0L-7, Fr4-0H-4  
 Overmeyer, Ludger Tu2-IL-5, Th2-IL-1  
 Ozaki, Kimihiro P-8  
 Ozeki, Yasuyuki P-15  
 Özmert, Alp Th3-0L-13
- P—  
 Paipulas, Domas Tu3-0L-3, P-12  
 Pan, Jia Tu1-0L-7  
 Panzarasa, G We1-0L-7  
 Park, Hong-Jin P-2  
 Park, Jung-Kyu P-5, P-6  
 Park, Tae-Soon P-33  
 Patel, Rajesh S Fr3-0L-5  
 Patrascioiu, Adrian Tu2-IL-1  
 Pauliukaite, Rasa Fr2-0L-7  
 Petr, Yudin V Tu4-0H-5  
 Petring, Dirk Tu1-PL-3  
 Pfeiffer, Manuel We1-0L-8, P-11
- Phaonaim, Rittichai We4-IH-5  
 Pietroy, David We2-0L-2  
 Pikuz, T P-9  
 Pikuz, T. Fr3-0L-4  
 Pirozhkov, A. Fr3-0L-4  
 Plech, Anton We1-0L-13  
 Poegen, Dirk Fr4-0H-1  
 Pohl, R. Tu3-0L-7  
 Poprawe, R. Th1-IJ-15  
 Poprawe, Reinhart Fr1-0L-4  
 Pournelle, Bertrand Tu3-0L-2, Tu3-0L-4, We2-0L-13  
 Purlys, Vytautas Tu3-0L-6  
 Pyatenko, Alexander We1-IL-9
- Q—  
 Qiao, Lingling We2-0L-4  
 Quentin, Ulf Th3-0L-3
- R—  
 Račiukaitis, Gediminas Th1-0L-13, Fr2-0L-1, Fr2-0L-7, P-20  
 Raciukaitis, Gediminas Th2-0L-20  
 Ragulis, Paulius Tu3-0L-3  
 Rapp, Ludovic Tu2-0L-2  
 Rehbock, Christoph We1-0L-10, Th3-0L-19  
 Reichmann, Lutz Th2-0L-4  
 Reif, Juergen Th2-0L-9  
 Reininghaus, Martin Th2-0L-22  
 Risse, Guenter We1-0L-8, Th2-0L-7, Th3-0L-9, P-11, P-30  
 Rekštytė, Sima Th1-0L-11  
 Ren, Yumpeng We3-0L-12  
 Reona, Nakamura Th1-0L-1  
 Repiev, Nikolai Fr1-0L-4  
 Rėza, Alfonsas Fr2-0L-1  
 Riedel, Frank Th1-0L-9, Fr1-0L-4  
 Riester, Dominik Th3-0L-13  
 Rocci, R We1-0L-7  
 Rodriguez, Pablo Fr4-0H-4  
 Rolser, Raphael Tu4-0H-9  
 Romano, Ilaria Th3-0L-6  
 Römer, G. R.B.E. We3-0L-14  
 Römer, G.R.B.E. Tu3-0L-7  
 Romero, Pablo Th3-0L-7, Fr4-0H-4  
 Rosenfeld, Arkadi Tu2-0L-4, We1-0L-6  
 Rost, Dirk Th3-0L-9, P-30  
 Roth, Bernhard Th2-IL-1  
 Russ, Simone We3-0L-13
- S—  
 Saito, Masateru P-7  
 Sakaki, H. Fr3-0L-4  
 Sakakura, Masaaki We2-0L-1, We2-0L-12, Fr1-IL-1  
 Sakaliūnienė, Jolita P-20  
 Sakashita, Hiroki Th2-0L-17  
 Sakuma, Kazuki P-17  
 Salminen, Antti We4-0H-8  
 Salter, Patrick S Tu1-IL-13  
 Sameshima, Toshiyuki Fr2-0L-2
- Sano, Naoki Fr2-0L-2  
 Santagata, Antonio We1-0L-12  
 Sarukura, Nobuhiko We3-0L-5  
 Sato, Tadate Tu3-0L-8, Fr4-0H-6, P-1  
 Sato, Takumi We2-0L-9  
 Schaubroeck, David We1-0L-4  
 Schedewy, Renald Th4-0H-2  
 Scheitler, Christian Tu1-0L-10  
 Schille, Joerg Th2-0L-7, Th2-0L-19  
 Schmidt, Michael Tu1-0L-10, Tu4-0H-7, We3-0L-1, We3-0L-2, We2-0L-11, Th3-0L-3, Th2-0L-8, Th2-0L-21, Th3-0L-17, Fr3-0L-7  
 Schneider, Friedrich Th4-0H-4  
 Schneider, Lutz Th2-0L-19  
 Schridder, Keegan Fr1-IJ-12  
 Schroeter, Anja We1-IL-1  
 Schuhmann, Uwe Th2-0L-4  
 Schulz-Ruhtenberg, Malte Fr1-IL-2  
 Scully, Patricia Th2-0L-19  
 Sechi, Yoshihisa Th4-0H-7  
 Seefeld, Thomas Th4-IH-1  
 Seffer, Oliver Th4-0H-4  
 Seniutinas, Gediminas Th1-0L-11  
 Serra Coromina, Pere P-13  
 Serra, Pere Tu2-IL-1  
 Shengyong, Pang We4-0H-10  
 Shibayanagi, Toshiya Fr2-0L-6  
 Shimizu, Hisashi Th3-0L-4  
 Shimizu, Seiji Th1-0L-3  
 Shimizu, Toshihiko We3-0L-5  
 Shimogaki, Tetsuya Tu1-0L-4, We3-0L-8  
 Shimotsuna, Yasuhiko We2-0L-1, We2-0L-12, Fr1-IL-1  
 Shin, Hyeon Jeong We4-0H-13, We4-0H-14  
 Shinohara, Takuya Th3-0L-4  
 Shinonaga, Togo Th2-0L-15  
 Shinozaki, Kenji We4-0H-4, We4-IH-5  
 Shinshi, Tadachiko P-26  
 Shiohara, Yuh We3-IL-7  
 Shiozawa, Manabu Fr1-IL-1  
 Shitajima, Shunsuke Fr3-0L-2  
 Shuichi, Fujikawa Th1-0L-1  
 Shukhov, Yuri G. Th3-0L-15  
 Siaulys, Nerijus Tu2-IL-6  
 Siebert, Christof We3-0L-13, Fr1-IL-5  
 Šimkienė, Irena Fr2-0L-1  
 Sirutkaitis, Romualdas P-12  
 Sirutkaitis, Valdas Tu3-0L-3, Tu2-IL-6, Th1-0L-11, P-12  
 Skobelev, I P-9  
 Skobelev, I. Fr3-0L-4  
 Šlapikas, Kęstutis P-20  
 Smith, Sullivan We4-0H-12  
 So, Sangwoo Th4-0H-10  
 Sohn, Ik-Bu P-14  
 Sokolov, Mikhail We4-0H-8  
 Soma, Naohiko Fr4-0H-8

- Song, Jiangxin Th1-OL-7  
 Sören, Richter P-15  
 Sparnacci, K We1-OL-7  
 Springer, André Th4-OH-4  
 St-Louis-Lalonde, Bastien Th3-IL-11  
 Starikov, S P-9  
 Starinski, Sergey V. Th3-OL-15  
 Staudenmaier, Christian Tu4-IH-6  
 Steenberge, Geert Van We1-OL-4  
 Stegailov, V P-9  
 Steger, Michael Tu1-OL-6  
 Stoian, Razvan We2-OL-2, We2-OL-15  
 Strauss, Johannes Fr3-OL-7  
 Stremdoerfer, Guy We2-OL-7, We2-OL-8  
 Streubel, René We1-OL-12  
 Suemoto, Tohru Tu2-OL-3  
 Suga, Yasuo We4-OH-6  
 Sugioka, Koji We2-OL-4, We3-OL-3, We2-OL-14, Th1-OL-7, Th2-OL-6, Th2-OL-11, Fr1-OJ-11, P-31  
 Sugiura, Nobuhiko P-19  
 Sugiyama, Kenji Th1-OL-10  
 Sun, C. Tu3-OL-7  
 Sun, Zhen We4-OH-11  
 Suzanovičienė, Rasa Fr2-OL-1  
 Suzuki, Kaoru P-7  
 Suzuki, Noritomo P-28  
 Suzuki, Ryusuke Th2-OL-17  
 Szkiva, Zsolt Th2-OL-6
- T—
- Takahashi, Akihiko Fr3-OL-3, P-19  
 Takahashi, Hidetomo P-17  
 Takahashi, Kenjiro P-24, P-25  
 Takahashi, Naoko P-28  
 Takahashi, Shintaro Th1-IL-4  
 Takahiro, Inagawa Th1-OL-1  
 Takayoshi, Shodai Tu2-OL-3  
 Takei, Ryota Tu2-OL-3  
 Takekuni, Tomohiro Fr1-OL-7  
 Takemura, Mamoru Th4-OH-12  
 Takuji, Magara Th1-OL-1  
 TAMAKI, Takayuki Tu3-OL-1  
 Tamhankar, Ashwini Fr3-OL-5  
 Tamotsu, S P-9  
 Tamulevičius, Sigitas Th1-OL-13, P-20  
 Tanabe, Rie Tu2-OL-8, Th2-OL-17  
 Tanaka, M P-9  
 Tang, Pan Cheng Th1-OL-8, Th3-OL-18  
 Tanigawa, Daichi Fr4-OH-2  
 Tao, Wang We4-OH-1  
 Tatsu, Eriko Fr1-IL-1  
 Tatsukoshi, Kentaro Th1-IL-4  
 Tatsumi, Yoshihiro Fr4-OH-2  
 Taubner, Thomas Th2-OL-22  
 Tempeler, Jenny We1-OL-2  
 Tenner, Felix Tu4-OH-7  
 Terakawa, Mitsuhiko Th3-OL-4  
 Thuilot, Michael We3-OL-4
- Tietz, Frank Th4-IH-9  
 Tomita, Takuro Tu2-OL-3  
 Tomotaka, Katsura Th1-OL-1  
 Torii, Shuichi Fr3-OL-3, P-19  
 Torralva, Ben Fr1-IJ-12  
 Tóth, Zsolt Th2-OL-14  
 Toyoda, Kazuki P-16  
 Trusovas, Romualdas Fr2-OL-7  
 Tsai, D. P. We1-IL-5  
 Tsai, Hsun-Heng Tu4-OH-2  
 Tsai, Xian-Zhe Tu2-OL-7  
 Tseng, M. L. We1-IL-5  
 Tsuji, Masaharu Th3-OL-14  
 Tsuji, Takayuki P-29  
 Tsuji, Takeshi We1-IL-9, Th3-OL-14  
 Tsukamoto, Masahiro Th2-OL-15, Fr4-OH-2, Fr2-OL-6, P-24, P-25  
 Tsuruoka, Noriyuki Th3-OL-16  
 Tsuyama, Miho Fr2-OL-6  
 Turan, Bugra Fr2-OL-5  
 Tzou, D. Y. We3-OL-12
- U—
- Uewada, Mitsuru Th2-OL-17  
 Ujhelyi, Ferenc Tu1-OL-11  
 Umeda, Mariko Fr1-IL-1  
 Unger, Claudia Tu2-IL-5  
 Ungers, Michael Tu4-OH-9  
 Uno, Kazuyuki Fr3-OL-2, P-27  
 Unrath, Mark A Th2-OL-2  
 Urniezius, Aivaras Tu2-IL-6  
 Usui, Hiroyuki We4-OH-4
- V—
- Vahimaa, Pati Th3-OL-1  
 Valette, Stéphane We2-OL-6  
 Valette, Stephane We2-OL-7, We2-OL-8  
 van de Burgt, Yoeri Th3-OL-8  
 van Loon, Wouter Th3-OL-8  
 Vanttaja, Ilkka Tu1-OL-5  
 Varlamova, Olga Th2-OL-9  
 Vass, Csaba Tu1-OL-11, P-23  
 Vazquez de Aldana, Javier Th1-IL-6  
 Vázquez de Aldana, Javier Rodríguez P-18  
 Verburg, P. C. We3-OL-14  
 Vinčiūnas, Antanas Fr2-OL-1  
 Visser, C.W. Tu3-OL-7  
 Voisiat, Bogdan Fr2-OL-1
- W—
- Wada, Hiroyuki Th3-OL-16  
 Wagener, Philipp We1-OL-12, We1-OL-13  
 Wakabayashi, Koji Fr4-OH-6  
 Wang, Chih-To P-4  
 Wang, Hsin-Wen Tu4-OH-2  
 Wang, Jian-Neng Tu4-OH-3, P-4  
 Wang, M. Th2-OL-12  
 Wang, S. Y. We3-OL-12  
 Wang, Yixiao Th2-IL-1  
 Watanabe, Koichi Fr1-IL-1  
 Watanabe, Takao Fr1-IL-1
- Watanabe, Teppei Th4-OH-8  
 Watanabe, Yousuke Th1-OL-2  
 Weber, Rudolf We4-OH-3  
 Wehner, Martin We1-OL-2, Th3-OL-13  
 Wei, Tai-Huei P-4  
 Wei, X Tu1-OL-12  
 Weickman, Antoine We2-OL-13  
 Weidong, Chen We4-OH-10  
 Weiler, Sascha Fr1-IL-5  
 Weissmantel, Steffen We1-OL-8, Th2-OL-7, Th3-OL-9, P-11, P-30  
 Whang, Kyoung-Hyun P-5  
 Wieduwilt, Jan We3-OL-13  
 Withford, Michael Th1-IL-5  
 Withford, Michael J Th1-IL-5  
 Wlodarczyk, Krystian L. Th3-OL-1  
 Wolfer, Tim Th2-IL-1  
 Won, Yoo Jai We3-OL-6  
 Woo, Sung-Sik P-6  
 Wortmann, Dirk Th2-OL-22  
 Wu, Dong We3-OL-3, We2-OL-14, Fr1-OJ-11  
 Wu, Si Zhu Fr1-OJ-11  
 Wu, Sizhu We3-OL-3, We2-OL-14  
 Wu, Wei-Te Tu4-OH-3, P-4  
 Wu, Yii-Der P-21  
 WU, Yixiong Th4-OH-11  
 Wunderlich, Joerg Th2-OL-4
- X—
- Xie, X.Z Tu1-OL-12  
 Xie, Z.Q. Th2-OL-12  
 Xiong, W. Th3-OL-5  
 Xu, Jian We2-OL-14, Fr1-OJ-11  
 Xu, Xianfan Tu1-OL-8  
 Xu, Yingxin Th1-OL-7  
 Xu, Zhe We1-OL-11
- Y—
- Yahata, Keisuke Th1-OL-3  
 Yalisove, Steven Fr1-IJ-12  
 Yamagiwa, Mitsuru Tu2-OL-3  
 Yamaguchi, Takuto Th4-OH-12  
 Yamamoto, Hajime Th3-OL-16  
 Yamamoto, Motomichi We4-OH-4, We4-IH-5  
 Yamanoi, Kohei We3-OL-5  
 Yamasaki, Kota Th1-OL-2  
 Yamashita, Kimihiro Th2-OL-15  
 Yamashita, Shotaro We4-OH-4  
 Yamashita, Tsugito Fr3-OL-6  
 Yamazaki, Yosuke Tu4-OH-4  
 Yan, Jiwang We4-OH-6  
 Yanagida, Takayuki We3-OL-5, P-29  
 Yang, Huan Th2-OL-16  
 Yeoh, Chuan T Th2-OL-8  
 Yi, Yong-Woo P-6  
 Yodo, Tokuo Th3-OL-16  
 Yogo, A. Fr3-OL-4  
 Yokota, Yuui We3-OL-5, P-29  
 Yokotani, Atushi Fr3-IL-1  
 Yoon, Ji-Wook P-5, P-6  
 Yoshida, Naoki We3-OL-5



Yoshihiro, Mikio	<a href="#">Fr4-OH-2</a>	—Z—		Zhao, Xiujian	<a href="#">Tu3-OL-4</a>
Yoshikawa, Akira	<a href="#">We3-OL-5</a> , <a href="#">P-29</a>	Zaikovskii, Vladimir I.	<a href="#">Th3-OL-15</a>	Zhong, Minlin	<a href="#">Th1-IJ-14</a>
You, Deyong	<a href="#">Tu4-OH-8</a>	Zaitsev, Alexander V	<a href="#">Fr4-OH-3</a>	Zhou, Y.S.	<a href="#">Th3-OL-5</a> , <a href="#">Th2-OL-12</a>
Yuan, X.R.	<a href="#">Tu1-OL-12</a>	Zaouter, Yoann	<a href="#">Fr1-OL-6</a>	ZHU, Yanyan	<a href="#">Th4-OH-11</a>
Yuko, Aono	<a href="#">Th1-OL-1</a>	Zeng, Xiaoyan	<a href="#">Th2-OL-16</a>	Zhukov, Vladimir P.	<a href="#">We3-OL-10</a>
		Zhakhovsky, V	<a href="#">P-9</a>	Žukauskas, Albertas	<a href="#">Th1-OL-11</a> , <a href="#">Th1-OL-12</a>
		Zhang, Haibin	<a href="#">Th2-OL-2</a>		