

ICPEPA-9

9th International Conference on Photo-Excited Processes and Applications

September 30 – October 3, 2014

Matsue, Japan

<http://icpepa9.com/>

Program and Technical Digest

updated September 29, 2014

Conference chairs

Koji Sugioka, *RIKEN, Japan*

Yasuyuki Tsuboi, *Osaka City University, Japan*

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Program

Oral Session

Day 1: Tuesday, September 30

Opening

8:20 Opening Remark

I. Modeling and Simulation

Chair: Chunlei Guo

8:30 Tu-I-1 **Invited** A067

Ultrashort-pulse laser excitation of dielectrics: Experiments and modeling, Kristian J. Wædegaard¹, Ditte B. Sandkamm¹, Lasse Haahr-Lillevang¹, Kathrine G. Bay¹, Alexandros Mouskeftaras², Stephane Guizard², Peter Balling¹, ¹*Department of Physics and Astronomy, Aarhus University, Ny Munkegade 120, DK-8000 Aarhus C, Denmark*, ²*Laboratoire des Solides Irradiés/CEA IRAMIS, Ecole Polytechnique - Palaiseau, France*

9:00 Tu-0-1 A058

Hydrodynamics driven by ultrashort laser pulse, M. B. Agranat¹, S. I. Ashitkov¹, M. Baba², T. Eyama³, A. Ya. Faenov^{1,4}, N. Hasegawa⁴, D. Hatomi⁵, D. K. Ilnitsky⁶, N. A. Inogamov⁷, T. Kawachi⁴, V. A. Khokhlov⁷, Y. Minami², M. Nishikino⁴, N. A. Ohnishi⁵, T. A. Pikuz¹, V. V. Shepelev⁸, T. Suemoto², S. Takayoshi³, R. Takei², T. Tomita³, M. Yamagiwa⁴, V. V. Zhakhovsky⁶, Yu. V. Petrov⁷, ¹*Joint Institute for High Temperatures, Russian Academy of Sciences, Russia*, ²*Institute for Solid State Physics, The University of Tokyo, Japan*, ³*Faculty of Engineering, The University of Tokushima, Japan*, ⁴*Quantum Beam Science Directorate, Japan Atomic Energy Agency, Japan*, ⁵*Department of Aerospace Engineering, Tohoku University, Japan*, ⁶*All-Russia Research Institute of Automatics, Rosatom, Moscow, Russia*, ⁷*L.D. Landau Institute for Theoretical Physics, Russian Academy of Sciences, Russia*, ⁸*Institute for Computer Aided Design, Russian Academy of Sciences, Russia*

9:15 Tu-0-2 A070

Large-scale atomistic simulations of laser ablation, generation of sub-surface voids, crystal defects and nanocrystalline surface layers in short pulse laser processing of metals, Chengping Wu¹, Eaman T. Karim¹, Maxim Shugaev¹, Cheng-Yu Shih¹, Leonid V. Zhigilei¹, ¹*University of Virginia, Department of Materials Science and Engineering, USA*

9:30 Tu-I-2 **Invited** A081

Squeezed thermal phonons, fractional atomic diffusion and control of nonthermal melting in laser excited solids, Martin E. Garcia¹, ¹*Institute of Physics, Universität Kassel, Germany*

10:00 Tu-0-3 A055

Thermodynamic and transport properties of metals under ultrafast laser-induced electron-phonon nonequilibrium, Emile Bevilion¹, Jean-Philippe Colombier¹, Vanina Recoules², Razvan Stoiian¹, ¹*Laboratoire Hubert Curien, UMR CNRS 5516, Université de Lyon, Université Jean-Monnet, France*, ²*CEA-DIF, France*

10:15 Coffee Break

II. New Material Synthesis and Modification

Chair: Jørgen Schou

10:40 Tu-I-3 **Invited** A078

New high-pressure silicon phases formed in fs-laser induced confined microexplosion, Ludovic Rapp^{1,2}, Bianca Haberl³, Chris J Pickard⁴, Jodie E Bradby³, Jim S Williams³, Eugene G Gamaly¹, Andrei V Rode¹, ¹*Laser Physics Centre, RSPE, The Australian National University, Australia*, ²*Laboratoire for Laser, Plasma, and Photonic Processes (LP3), Aix-Marseille Université, France*, ³*Electronic Materials Engineering, RSPE, The Australian National University, Australia*, ⁴*Department of Physics and Astronomy, University College London, UK*

11:10 Tu-0-4 **Student** A094

Atomistic-continuum modeling of short laser pulse melting of Si targets, Vladimir P. Lipp^{1,2}, Dmitry S. Ivanov^{1,2}, Baerbel Rethfeld¹, Martin E. Garcia², ¹*Technical University of Kaiserslautern, Germany*, ²*University of Kassel, Germany*

11:25 Tu-I-4 **Invited** A073

Enhanced laser-induced condensation using UV and dual pulses, Mary Matthews¹, Stefano Henin¹, François Pomel¹, Francis Théberge², Philippe Lassonde³, Jean-François Daigle², Jean-Claude Kieffer³, Júlio CS Chagas¹, Jean-Pierre Wolf¹, Jérôme Kasparian⁴, ¹*Université de Genève, GAP-Biophotonics, Switzerland*, ²*Defence R&D Canada Valcartier, Canada*, ³*INRS-EMT, Canada*, ⁴*Université de Genève, GAP-Non-linear, Switzerland*

11:55 Tu-0-5 **Student** A023

Generation of glass nanofibers from back surface of substrate using pulsed UV 355 nm laser, Sho Itoh^{1,2}, Masaaki Sakakura², Yasuhiko Shimotsuna², Kiyotaka Miura², ¹*Products Quality Laboratory, Nippon Electric Glass Co., Ltd., Japan*, ²*Department of Material Chemistry, Graduate School of Kyoto University, Japan*

12:10 Tu-0-6 A030

Vacuum ultraviolet fluorine laser formation of corrosion resistant iron thin films, Masayuki Okoshi¹, Yuta Aawaihara¹, Tsugito Yamashita², Narumi Inoue¹, ¹*National Defense Academy, Japan*, ²*Kanto Gakuin University, Japan*

12:25 Lunch Time

III. Functional Film Deposition

Chair: Tomohiko Nakajima

14:30 Tu-0-7 A020

Pulsed laser deposition of chalcogenic films for solar cell materials, Andrea Cazzaniga¹, Rebecca B Ettlinger¹, Jørgen Schou¹, Stela Canulescu¹, Nini Pryds², ¹*DTU Fotonik, Technical University of Denmark, DK-4000 Roskilde, Denmark*, ²*DTU Energy Conversion, Technical University of Denmark, DK-4000 Roskilde, Denmark*

14:45 Tu-0-8 **Student** A039

Fabrication and characteristics of ordered ZnO microcrystals by four-beam interference laser patterning, Tetsuya Shimogaki¹, Hirotaka Kawahara¹, Shihomi Nakao¹, Kosuke Harada¹, Mitsuhiro Higashihata¹, Daisuke Nakamura¹, Yoshiki Nakata², Tatsuo Okada¹, ¹*Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan*, ²*Institute of Laser Engineering, Osaka University, Japan*

15:00 Tu-0-9 **Student** A047

The optical property and crystallinity of ZnO film formed by CO₂ laser annealing in SiO₂ matrix, Kota Yamasaki¹, Hiroshi Ikenoue¹, Tetsuya Shimogaki¹, Yousuke Watanabe¹, Daisuke Nakamura¹, Tatsuo Okada¹, ¹*Kyushu University, Japan*

15:15 Tu-0-10 A069

TiO₂ nanocrystallites agglomerated in self-organized web-structures synthesized in gas-phase pulsed laser ablation, Takehito Yoshida¹, Katsushi Wakamiya², Akira Sugimura², Ikurou Umezu², ¹*Anan National College of Technology, Japan*, ²*Department of physics, Konan University, Japan*

15:30 Coffee Break

IV. Advanced Laser Processing for Practical Applications

Chair: Xianfan Xu

16:00 Tu-0-12

A062

Three-dimensional femtosecond laser processing using holographic vector wave, Satoshi Hasegawa¹, Yoshio Hayasaki¹, ¹*Center for Optical Research and Education (CORE), Utsunomiya University, Japan*

16:15 Tu-0-13

A110

Model of laser-induced polymerization using smooth varying intensity distribution, Evaldas Stankevičius¹, Mindaugas Gedvilas¹, Gediminas Račiukaitis¹, ¹*Center for Physical Sciences and Technology, Lithuania*

16:30 Tu-0-14

Student

A038

Laser doping into ZnO nanowires using the Sb nanoparticles, Hirotaka Kawahara¹, Tetsuya Shimogaki¹, Mitsuhiro Higashihata¹, Daisuke Nakamura¹, Tatsuo Okada¹, ¹*Graduate School of Information Science and Electrical Engineering, Kyushu University, Japan*

16:45 Tu-0-15

A089

In situ measurement and comparison at laser scribing of CIGS thin film solar cell with rear side and front side approach, Xi Wang^{1,2}, Martin Ehrhardt¹, Pierre Lorenz¹, Lukas Bayer¹, Klaus Zimmer¹, ¹*Leibniz Institut für Oberflächenmodifikation, Germany*, ²*Nanjing University of Science & Technology, China*

17:00 Tu-0-16

Student

A063

An experimental study on laser induced thin film spallation, Hyeonju Yu¹, Jack J. Yoh¹, Jungwook Kim¹, ¹*Seoul National University, Korea*

17:15 Tu-0-17

A097

Heat conduction analysis of laser CFRP processing with IR and UV laser lights, Kenjiro Takahashi¹, Masahiro Tsukamoto¹, Shin-ichiro Masuno¹, Yuji Sato¹, ¹*JWRI, Osaka University, Japan*

17:30 Tu-0-18

A119

Spatiotemporal focusing of ultrashort laser pulses for materials processing, Fei He^{1,2}, Zhaohui Wang¹, Jielei Ni¹, Bin Zeng¹, Koji Sugioka², Ya Cheng¹, ¹*State Key Laboratory of High Field Laser Physics, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China*, ²*Center for Advanced Photonics, RIKEN, Japan*

Poster Session I

18:00 Tu-P Posters

19:30 close

Day 2: Wednesday, October 1

V. Fundamental Phenomena and Theoretical Approach

Chair: Jürgen Reif

9:00 We-I-1

Invited

A040

Plasmonic devices for controlling light at the nano scale, Tim Davis¹, Daniel Gomez¹, Fatima Eftekhari², ¹*CSIRO Materials Science and Engineering, Australia*, ²*Melbourne Centre for Nanofabrication, Australia*

9:30 We-0-1

Student

A034

Evaluation of surface plasmon resonance effect in the gap between nanoelectrodes in molecular junction by the finite-difference time-domain study, Li-Wen Huang¹, Yen-Hsun Su¹, Chao-Cheng Kaun², ¹*Department of Materials Science and Engineering, National Cheng Kung University, Taiwan*, ²*Research Center for Applied Sciences, Academia Sinica, Taiwan*

9:45 We-0-3 A090
Molecular dynamics modeling of fs laser pulse nanostructuring of materials, Dmitry S. Ivanov^{1,2}, Vladimir P. Lipp^{1,2}, Marin E. Garcia¹, Baerbel Rethfeld², Andreas Blumenstein³, Peter Simon³, Juergen Ihlemann³, ¹*University of Kassel, Kassel, Germany*, ²*Technical University of Kaiserslautern and OPTIMAS research center, Kaiserslautern, Germany*, ³*Laser-Laboratorium Göttingen e.V. Göttingen, Germany*

10:00 We-0-4 **Student** A098
Dependence of ablation rate on laser fluence for metals by oblique femtosecond laser irradiation, Yasuhiro Miyasaka^{1,2}, Masaki Hashida^{1,2}, Takaya Nishii^{1,2}, Shunsuke Inoue^{1,2}, Shuji Sakabe^{1,2}, ¹*Advanced Research Center for Beam Science, Institute for Chemical Research, Kyoto University, Japan*, ²*Department of Physics, Graduate School of Science, Kyoto University, Japan*

10:15 We-0-5 A042
Ion expansion from extreme ultraviolet (EUV) and laser ablation plasmas, Nozomi Tanaka¹, Masaya Masuda¹, Masakatsu Murakami¹, Atsushi Sunahara², Shinsuke Fujioka¹, Hiroaki Nishimura¹, ¹*Institute of Laser Engineering, Osaka University, Japan*, ²*Institute for Laser Technology, Japan*

10:30 *Coffee Break*

VI. Organic and Biological Applications

Chair: Ya Cheng

10:55 We-0-7 A086
Motion analysis of biological cell induced by femtosecond laser impulse, Hirohisa Uedan¹, Akihiro Maruyama¹, Takanori Iino¹, Yoichiro Hosokawa¹, ¹*Nara Institute of Science and Technology, Japan*

11:10 We-0-8 **Student** A096
Laser controlled drug release from Ce6-gold nanorods composites in living cells: A FLIM study, Yongkui Xu¹, Jiyao Chen¹, ¹*State Key Laboratory of Surface Physics and Department of Physics, and Key Laboratory of Micro and Nano Photonic Structures (Ministry of Education), Fudan University, China*

11:25 We-0-9 **Student** A010
Fabrication of 3D microfluidics using femtosecond laser for clear microscopic observation of living cell, Ryota Oikawa¹, Tatsuya Ogawa¹, Yasutaka Hanada^{1,2}, Koji Sugioka², Katsumi Midorikawa², ¹*Hirosaki University, Japan*, ²*RIKEN, Japan*

11:40 We-0-10 A013
Femtosecond laser 3D glass microprocessing for on-chip manipulation of biological samples using electrofluidics, Jian Xu¹, Hiroyuki Kawano², Dong Wu¹, Katsumi Midorikawa¹, Koji Sugioka¹, ¹*RIKEN Center for Advanced Photonics, Japan*, ²*RIKEN Brain Science Institute, Japan*

11:55 We-0-11 A093
Combinatorial Matrix-Assisted Pulsed Laser Evaporation: Application to biopolymer thin film assemblies signalling to human osteoblasts, Carmen Ristoscu¹, Felix Sima¹, Emanuel Axente¹, Livia E. Sima², Merve Erginer³, Mehmet S. Eroglu³, Natalia Mihailescu¹, Stefana M. Petrescu², Ebru Toksoy Oner³, Ion N. Mihailescu¹, ¹*National Institute for Lasers, Plasma and Radiation Physics, Romania*, ²*Department of Molecular Cell Biology, Institute of Biochemistry, Romanian Academy, Romania*, ³*Marmara University, Turkey*

12:10 We-0-12 A091
Soft laser transfer of organic / inorganic composites for biocide, drug delivery, biomimetic or biosensing applications, Ion N. Mihailescu¹, Carmen Ristoscu¹, Felix Sima¹, ¹*National Institute for Lasers, Plasma and Radiation Physics, Romania*

12:25 *Lunch Time*

VII. Synthesis of Nanomaterials

Chair: Tetsuya Makimura

- 13:50 We-I-2 **Invited** A071
Pulsed laser melting in liquid for submicron spherical particles of crystalline functional materials —Fluence effect on particle size—, Naoto Koshizaki¹, Yoshie Ishikawa², Alexander Pyatenko², ¹Graduate School of Engineering, Hokkaido University, Japan, ²Nanosystem Research Institute (NRI), National Institute of Advanced Industrial Science and Technology (AIST), Japan
- 14:20 We-I-3 **Invited** A021
Organic nanoparticles formation by pulsed-laser irradiation to liquid/liquid interfaces, Tomoyuki Yatsuhashi¹, ¹Graduate School of Science, Osaka City University, Japan
- 14:50 We-0-13 A008
Fabrication of non-toxic gold particles using laser-ablation and laser-induced melting in liquids, Takeshi Tsuji¹, Yuuma Higashi², Masaharu Tsuji², Yoshie Ishikawa³, Naoto Koshizaki⁴, ¹Shimane University, Japan, ²Kyushu University, Japan, ³National Institute of Advanced Industrial Science and Technology, Japan, ⁴Hokkaido University, Japan
- 15:05 We-0-14 A007
Preparation and optical properties of Y₂O₃:Er,Yb nanoparticles prepared by laser ablation in liquid, Hiroyuki Wada¹, Takashi Nunokawa¹, Yuji Onodera¹, Tomohiro Ikehata¹, Kazuki Mori¹, Shunichiro Ogura¹, Toshiaki Kamachi¹, Osamu Odawara¹, ¹Tokyo Institute of Technology, Japan
- 15:20 We-0-15 A101
Magneto-optical properties of magnetic nanoparticles precipitated in glasses using femtosecond laser, Seisuke Nakashima^{1,2}, Koji Sugioka², Katsumi Midorikawa², Kohki Mukai¹, ¹Yokohama National University, Japan, ²RIKEN, Japan
- 15:35 Coffee Break

VIII. Ultrafast Laser-Induced Nanostructuring

Chair: Razvan Stoian

- 16:00 We-I-4 **Invited** A056
The dynamics of nanostructure formation on solid surfaces, induced by femtosecond laser irradiation, Juergen Reif¹, Chrisitan Martens¹, Markus Ratzke¹, Sebastian Uhlig¹, Olga Varlamova¹, ¹BTU Cottbus-Senftenberg, Germany
- 16:30 We-0-16 A100
Formation threshold of periodic grating structures on metal self-organized by femtosecond laser pulses, Masaki Hashida¹, Laura Gemini², Takaya Nishii¹, Yasuhiro Miyasaka¹, Hitoshi Sakagami³, Shunsuke Inoue¹, Shuji Sakabe¹, ¹Institute for Chemical Research, Kyoto University, Japan, ²Czech Technical University, Czech Republic, ³National Institute for Fusion Science, Japan
- 16:45 We-0-17 **Student** A075
Surface nanostructure formation on biodegradable polymer film by ultraviolet femtosecond laser irradiation, Shuhei Yada¹, Mitsuhiro Terakawa¹, ¹School of Integrated Design Engineering, Keio University, Japan
- 17:00 We-0-18 A103
Control of cell spreading by periodic nanostructures formation with femtosecond laser, Togo Shinonaga¹, Masahiro Tsukamoto¹, Kazuya Miyagawa², Kazuyuki Hara², Takuya Kawa², Peng Chen³, Akiko Nagai³, Takao Hanawa³, ¹Joining and Welding Research Institute, Osaka University, Japan, ²Graduate School of Engineering, Osaka University, Japan, ³Institute of Biomaterials and Bioengineering, Tokyo Medical and Dental University, Japan
- 17:15 We-0-19 A079
Controlling periodic nanostructure formation on metal surfaces with femtosecond laser pulses, Kenzo Miyazaki¹, Godai Miyaji^{1,2}, Toshishige Inoue¹, ¹Institute of Advanced Energy, Kyoto University, Japan, ²Department of Applied Physics, Tokyo University of Agriculture and Technology, Japan
- 17:30 We-0-20 A065
Designing of interfering pattern in ultra-short pulse laser processing and applications, Yoshiki Nakata¹, Naoto Shimada¹, Yoshiki Matsuba¹, Noriaki Miyanaga¹, ¹ILE, Osaka University, Japan

17:45 We-0-21

A009

Femtosecond laser surface structuring with optical vortex beams, K.K. Anoop^{1,2}, Andrea Rubano^{1,2}, Rosalba Fittipaldi³, Xuan Wang², Domenico Paparo², Antonio Vecchione³, Lorenzo Marrucci^{1,2}, Riccardo Bruzzese^{1,2}, Salvatore Amoruso^{1,2}, ¹*Dipartimento di Fisica, Università degli Studi di Napoli Federico II, Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*, ²*CNR-SPIN, UOS Napoli Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*, ³*CNR-SPIN, UOS Salerno Via Giovanni Paolo II 132, 84084 Fisciano, Italy*

Poster Session II

18:00 We-P Posters

19:30 close

Day 3: Thursday, October 2

IX. Dynamics and Diagnostics

Chair: Leonid Zhigilei

8:30 Th-I-1

Invited

A017

Laser-induced forward transfer of liquids: Time-resolved imaging analysis of the jetting dynamics, Pere Serra¹, Adrian Patrascioiu¹, Camilo Florian¹, Juan Marcos Fernández-Pradas¹, José Luis Morenza¹, ¹*Universitat de Barcelona, Departament de Física Aplicada i Òptica, Spain*

9:00 Th-0-1

A077

Nanosecond temperature measurement for the development of low temperature fabrication of oxide thin films by pulsed UV laser irradiation, Kentaro Shinoda¹, Tomohiko Nakajima¹, Tetsuo Tsuchiya¹, ¹*National Institute of Advanced Industrial Science and Technology (AIST), Japan*

9:15 Th-0-2

A035

Absorption property change of quartz during ns pulsed CO₂ laser processing, Yosuke Watanabe¹, Hiroshi Ikenoue¹, Kota Yamasaki¹, Daisuke Nakamura¹, Tatsuo Okada¹, ¹*Kyushu University, Japan*

9:30 Th-0-3

A117

3D visualization of XFEL beam focusing properties using LiF crystals, Tatiana Pikuz^{1,2}, Anatoly Faenov^{1,2}, Takeshi Matsuoka³, Norimasa Ozaki³, Yuichi Inubashi⁶, Makina Yabashi^{4,6}, Yuya Sato⁵, Hirokatsu Yumoto⁶, Haruhiko Ohashi^{4,6}, Satoshi Matsuyama⁷, Kazuto Yamauchi^{7,8}, Tetsuya Ishikawa^{4,6}, Ryosuke Kodama^{1,3}, ¹*Institute for Academic Initiatives, Osaka University, Japan*, ²*Joint Institute for High Temperatures, Russian Academy of Sciences, Russia*, ³*PPC and GSE Osaka University, Japan*, ⁴*RIKEN Harima Institute, Japan*, ⁵*Division of Electrical, Electronic and Information Engineering, Graduate School of Engineering, Osaka University, Japan*, ⁶*JASRI/SPring-8, Japan*, ⁷*Department of Precision Science and Technology, Graduate School of Engineering, Osaka University, Japan*, ⁸*Center for Ultra-Precision Science and Technology, Graduate School of Engineering, Osaka University, Japan*

9:45 Th-0-4

A060

Non-equilibrium electronic Grüneisen parameter, Jincheng Wang, Chunlei Guo, ¹*University of Rochester, USA*

10:00 Coffee Break

X. Nano-scale and Ultrafast Laser Processing

Chair: Koji Sugioka

10:25 Th-I-2 **Invited** A006
Parallel nanolithography using 1,000 nanoscale bowtie antennas, Xianfan Xu¹, ¹*Purdue University, USA*

10:55 Th-I-3 **Invited** A114
Ultrashort laser induced material modifications in glass: Mechanisms and applications from the view point of micromechanics and polymorphic phase transformations, Yves Bellouard¹, ¹*Eindhoven University of Technology, The Netherlands*

11:25 Th-I-4 **Invited** A005
Dynamics and control of ultrafast laser volume nanostructuring of glass, Razvan Stoian¹, Konstantin Mishchik¹, Cyril Maucclair¹, Praveen Kumar Velpula¹, Manoj Kumar Bhuyan¹, Ciro D'Amico¹, Jean-Philippe Colombier¹, Marian Zamfirescu², Guanghua Cheng³, ¹*Laboratoire Hubert Curien, UMR 5516 CNRS, Université de Lyon, Université Jean Monnet, 42000 St. Etienne, France*, ²*National Institute for Laser, Plasma and Radiation Physics, 077125 Magurele, Bucharest, Romania*, ³*State Key Laboratory of Transient Optics and Photonics, Xi'an Institute of Optics and Precision Mechanics, CAS, 710119 Xi'an, China*

11:55 Th-0-5 A033
Control of Si-rich region inside a sodalime glass by parallel femtosecond laser focusing at multiple spots, Masaaki Sakakura¹, Torataro Kurita², Kouhei Yoshimura², Naoaki Fukuda¹, Yasuhiko Shimotsuma², Kiyotaka Miura², ¹*Office of Society-Academia Collaboration for Innovation, Kyoto University, Japan*, ²*Department of Material Chemistry, Graduate School of Engineering, Kyoto University, Japan*

12:10 Break

Excursion and Banquet

12:30 Departure from Kunibiki Messe

13:30 Arrival at **Izumo Taisha Shrine**15:30 Departure from **Izumo Taisha Shrine**17:00 Arrival at **Yushi-En Garden** (walk across the garden)18:00 **Banquet**20:30 Departure from **Yushi-En Garden**

Day 4: Friday, October 3

XI. Plasmonics and Nanoprocessing

Chair: Henry Helvajian

8:30 Fr-I-1 **Invited** A016
Sub-50 nm ablation inside a mesoporous glass immersed in liquid with femtosecond laser pulses: Mechanism and applications, Ya Cheng¹, Yang Liao¹, Koji Sugioka², ¹*Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences, China*, ²*RIKEN Center for Advanced Photonics, Japan*

9:00 Fr-I-2 **Invited** A057
Nanolithography by optothermal manipulation of gold nanoparticles, Theobald Lohmueller¹, ¹*Photonics and Optoelectronics group, Department of Physics, LMU Munich, Germany*

9:30 Fr-0-1 **Student** A018
Influence of gold nanoparticles on diatom template, Ting-Wei Shen¹, Wen-Lin Wang¹, Yen-Hsun Su¹, ¹*Department of Materials Science and Engineering in National Cheng-Kung University, Taiwan*

9:45 Fr-0-2 **Student** A029

Surface plasmon of Au nanoparticles incorporation onto layered MoS₂ enhancing photoluminescence, Wenlin Wang¹, Yenhsun Su¹, Tingwei Shen¹, ¹*Department of Materials Science and Engineering, National Cheng Kung University, Taiwan*

10:00 Fr-0-3 A200

Optical trapping of nanoparticles based on plasmonic nanohole arrays, Tatsuya Shoji¹, Yasuyuki Tsuboi¹, ¹*Osaka City University, Japan*

10:15 *Coffee Break*

XII. Novel Technologies for Photon Generation and Processing

Chair: Yasuyuki Tsuboi

10:40 Fr-I-3 **Invited** A109

Chiral materials fabrication by vortex lasers, Takashige Omatsu¹, ¹*Chiba University, Japan*

11:10 Fr-0-4 A025

Photo-excitation of exotic states of matter by ultra-intense X-ray radiation of 200 TW femtosecond laser-produced plasma, Anatoly Faenov^{1,2}, James Colgan³, Joe Abdallah³, Stephanie Hansen⁴, Tatiana Pikuz^{2,5}, Sergei Pikuz², Igor Skobelev², Mamiko Nishiuchi⁵, H Sakaki⁵, S Maeda^{5,6}, A Sagisaka⁵, Alexander Pirozhkov⁵, Koichi Ogura⁵, Yuji Fukuda⁵, Noboru Hasegawa⁵, Masaharu Nishikino⁵, Masaki Kando⁵, Tetsuya Kawachi⁵, Paul Bolton⁵, Kiminori Kondo⁵, Shinichi Masuda⁷, Alexei Zhidkov⁷, Ryosuke Kodama^{1,7}, ¹*Institute for Academic Initiatives, Osaka University, Japan*, ²*Joint Institute for High Temperatures, Russian Academy of Sciences, Russia*, ³*Theoretical Division, Los Alamos National Laboratory, USA*, ⁴*Sandia National Laboratories, USA*, ⁵*Kansai Photon Science Institute, Japan Atomic Energy Agency, Japan*, ⁶*Interdisciplinary Graduate School of Engineering Sciences, Kyushu University, Japan*, ⁷*PPC and GSE Osaka University, Japan*

11:25 Fr-0-5 **Student** A064

Laser-induced plasma assisted combustion of liquid fuels, Seok H Lee¹, Jack J Yoh¹, ¹*Seoul National University, Korea*

11:40 Fr-0-6 A088

Efficient ablation of silica by nanosecond laser plasma soft x-ray irradiation, Tetsuya Makimura¹, Shuichi Torii¹, Hiroyuki Niino², Kouichi Murakami¹, ¹*Institute of Applied Physics, University of Tsukuba, Japan*, ²*Research Institute of Innovation in Sustainable Chemistry, AIST, Japan*

11:55 Fr-0-7 A004

An organic optical transistor operated under ambient conditions: Proof of principle and modelling, Martti Pärs¹, Michael Gradmann¹, Regina Schmidt¹, Katja Gräf², Peter Bauer², Mukundan Thelakkat², Jürgen Köhler¹, ¹*Experimental Physics IV, University of Bayreuth, Germany*, ²*Applied Functional Polymers, University of Bayreuth, Germany*

12:10 Fr-I-4 **Invited** A111

Enhanced mobility of a molecular adsorbate induced via optically generated surface acoustic waves: Ethylene on crystalline silicon, Henry Helvajian¹, ¹*Physical Sciences Laboratories, The Aerospace Corporation, USA*

Closing

12:40 Closing Remarks

12:55 *Lunch Time*

13:30 *close*

Poster Session

Poster Session I (Tu-P Posters)

18:00–19:30 on Tue, Sept. 30

Theoretical Approach, Simulation and Modeling of Photo-Excited Processes

Tu-P-1

A032

Coherent π -electron dynamics in a nonplanar chiral aromatic molecule by using linearly polarized laser, Hirobumi Mineo¹, ShengHsien Lin^{1,2}, Yuichi Fujimura^{2,3},
¹*Institute of atomic and molecular science, Academia Sinica, Taiwan*, ²*Department of Applied Chemistry, Institute of Molecular Science, Taiwan*, ³*Department of Chemistry, Graduate School of Science, Tohoku University, Japan*

Fundamental Phenomena of Laser-Matter Interactions

We-P-1

Student

A044

Spectroscopic observation of ablation plasma generated with a laser-driven extreme ultraviolet (EUV) light source, Masaya Masuda¹, Nozomi Tanaka¹, Atsushi Sunahara², Shinsuke Fujioka¹, Hiroaki Nishimura¹,
¹*Institute of Laser Engineering, Osaka University, Japan*, ²*Institute for Laser Technology, Japan*

We-P-1 will be presented on Tuesday.

Tu-P-2

A107

Effect of surrounding gas condition on surface integrity in micro-drilling of SiC by ns pulsed laser, Yasuhiro Okamoto¹, Kiichi Asako¹, Norio Nishi², Tomokazu Sakagawa², Akira Okada¹,
¹*Okayama University, Japan*, ²*Kataoka Corporation, Japan*

Dynamics and Diagnostics of Photo-Excited Processes

Tu-P-3

A050

Critical value for efficient nucleation in oxide thin films under pulsed UV laser irradiation, Tomohiko Nakajima¹, Kentaro Shinoda¹, Tetsuo Tsuchiya¹,
¹*Flexible Chemical Coating Research Group, Advanced Manufacturing Research Institute, National Institute of Advanced Industrial Science and Technology, Japan*

Tu-P-4

Student

A072

Single molecule fluorescence study on phase separation dynamics of aqueous thermo-responsive polymer solutions, Takanori Tada¹, Yukiteru Katsumoto², Karel Goossens³, Hiroshi Uji-i³, Hofkens Johan³, Noboru Kitamura¹, Yasuyuki Tsuboi⁴,
¹*Hokkaido University, Japan*, ²*Hiroshima University, Japan*, ³*KU Leuven, Belgium*, ⁴*Osaka City University, Japan*

Photo/Laser-Induced Desorption from Surfaces

Tu-P-5

A027

Production of warm cluster anions by laser ablation, Tohru Kobayashi¹, Yukari Matsuo²,
¹*Riken Advanced Photonics, Japan*, ²*Hosei Univ., Dept. Advanced Science, Japan*

Resonant and Non-Resonant Processes in Photo/Laser-Induced Materials Processing

Tu-P-6

Student

A014

Random lasing in self-assembled photonic liquid crystal, Chun-Wei Chen¹, Tsung-Hsien Lin¹,
¹*Department of Photonics, National Sun Yat-Sen University, Taiwan*

Deposition and coating of thin films, multilayers, and nanostructured materials

Tu-P-7 A054

Ultra-short pulsed laser ablation of magnesium diboride, Roberto Teghil¹, Angela De Bonis¹, Agostino Galasso¹, Antonio Santagata², ¹*Dipartimento di Scienze, Università della Basilicata, Via dell'Ateneo Lucano 10, 85100 Potenza, Italy*, ²*CNR-ISM U.O.S. Tito Scalo, C/da S. Loja, 85050 Tito Scalo, Italy*

Tu-P-8 **Student** A104

Photocatalytic reaction of transferred TiO₂ films on glass fiber/epoxy substrate by laser induced forward transfer, Syota Kigawa¹, Satoshi Kurumi², Kaoru Suzuki², ¹*Graduate school of Electrical Engineering College of Science & Technology Nihon University, Japan*, ²*Department of Electrical Engineering College of Science & Technology Nihon University, Japan*

Synthesis of Nanomaterials

Tu-P-9 A051

MAPLE-deposited PFO films: Effects of the target thermal distribution on the film morphology, Chiara Leo¹, Anna Paola Caricato¹, Maura Cesaria¹, Marco Anni¹, Sandro Lattante¹, Andrea Perulli², Maurizio Martino¹, ¹*Dipartimento di Matematica e Fisica "E. De Giorgi", Università del Salento, Italy*, ²*Dipartimento di Ingegneria dell'Innovazione, Università del Salento, Italy*

Tu-P-10 A083

Ultrashort laser ablation and deposition of titanium dioxide at 527 nm, D. K. Pallotti^{1,2}, X. Wang², R. Fittipaldi³, S. Lettieri², A. Vecchione³, S. Amoroso^{1,2}, ¹*Dipartimento di Fisica, Università degli Studi di Napoli Federico II, Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*, ²*CNR-SPIN, UOS Napoli Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*, ³*CNR-SPIN, UOS Salerno Via Giovanni Paolo II 132, 84084 Fisciano, Italy*

Photo/Laser-Induced Nanoscale Processing

Tu-P-11 A080

Fabrication of nanograting with plasmonic near-field induced by ultraviolet femtosecond laser pulses, Godai Miyaji^{1,2}, Kenzo Miyazaki², ¹*Department of Applied Physics, Tokyo University of Agriculture and Technology, Japan*, ²*Institute of Advanced Energy, Kyoto University, Japan*

Plasmon-Enhanced Photon/Laser Processing

Tu-P-12 **Student** A085

High-sensitive fluorescence detection based on a micro-assembly of polymer chains formed by plasmon-based optical trapping, Daiki Sugo¹, Tatsuya Shoji², Yasuyuki Tsuboi^{2,3}, ¹*Hokkaido University, Japan*, ²*Osaka City University, Japan*, ³*JST (Japan Science and Technology Cooperation), Japan*

Cutting, Drilling, Surface Patterning and Micromachining

Tu-P-13 A003

Influence of the polarization state on structure, optical, and electrical properties by using nanosecond pulsed laser patterning on indium tin oxide films, C. C. Yang¹, W. T. Hsiao¹, S. F. Tseng¹, N. N. Chu¹, M. C. Wang², C. K. Chung¹, D. Chiang¹, K. C. Huang², M. F. Chen², ¹*Instrument Technology Research Center, National Applied Research Laboratories, Taiwan*, ²*Department of Mechatronics Engineering, National Changhua University of Education, Taiwan*

Tu-P-14 A028

A rapid evaluating micro device patterned by using 355 nm pulsed UV laser for the determination of lithium-ion battery state-of-health (SOH), Min-Wei Hung¹, Kuo-Cheng Huang¹, Wen-Tse Hsiao¹, Hsin-Yi Tsai¹, Chih-Chung Yang¹, ¹*Instrument Technology Research Center, National Applied Research Laboratories, Taiwan*

Surface Modification Including Crystallization, Amorphization, Phase Transformation, and Doping

Tu-P-15 *Student* A048

Shallow impurity levels in femtosecond laser modified areas on semi insulating 6H-SiC, Eizo Yanagita¹, Manato Deki¹, Yoshiki Naoi¹, Takahiro Makino², Takeshi Ohshima², Takuro Tomita¹, ¹*The University of Tokushima, Japan*, ²*Japan Atomic Energy Agency, Japan*

Surface Nanostructuring and Nanoripple Formation

Tu-P-16 A092

Femtosecond laser modification of double layer coatings, Carmen Ristoscu¹, Biljana Gakovic², Catalina Albu¹, Marian Zamfirescu¹, Bojan Radak², Milan Trtica², Suzana Petrovic², Ion N. Mihailescu¹, ¹*National Institute for Lasers, Plasma and Radiation Physics, Romania*, ²*Institute of Nuclear Sciences Vinča, University of Belgrade, Serbia*

Manipulated/Shaped Beam Processing

Tu-P-17 *Student* A036

Femtosecond laser direct written visible waveguide lasers in Pr³⁺ doped ZBLAN glass using simultaneous spatial and temporal focusing, Yusuke Yamanaka¹, Kenichi Hirose¹, Hiroki Tanaka¹, Fumihiko Kannari¹, ¹*Department of Electronics and Electrical Engineering, Keio University, Japan*

Tu-P-18 *Student* A074

Holographic laser sweep for debris removal using line-shaped beam irradiation, Kazuki Sakuma¹, Satoshi Hasegawa¹, Hidetomo Takahashi², Michiharu Ota², Yoshio Hayasaki¹, ¹*Center for Optical Research and Education (CORE), Utsunomiya University, Japan*, ²*AISIN SEIKI CO., LTD., Japan*

Medical and Biological Applications

Tu-P-19 *Student* A015

Disruption of PLGA microcapsules by femtosecond laser irradiation, Kazumasa Ariyasu¹, Mitsuhiro Terakawa¹, ¹*School of Integrated Design Engineering, Keio University, Japan*

Tu-P-20 *Student* A076

Biochip fabrication using femtosecond laser for mechanism study of symbiotic relationship between cyanobacteria and seedling root, Nobuaki Ishikawa¹, Yasutaka Hanada^{1,2}, Ikuko Ishikawa², Koji Sugioka², Katsumi Midorikawa², ¹*Hirosaki University, Japan*, ²*RIKEN, Japan*

Poster Session II (We-P Posters)

18:00–19:30 on Wed, Oct. 1

Fundamental Phenomena of Laser-Matter Interactions

We-P-1 will be presented on Tuesday.

We-P-2

A049

Thermodynamic and kinetic properties of metals with highly excited electron subsystem, Yu. V. Petrov^{1,2}, N. A. Inogamov¹, V. V. Zhakhovsky³, V. A. Khokhlov¹, P. R. Levashov^{2,4}, K. P. Migdal³, D. V. Knyazev^{2,4}, B. D. Demaske⁵, ¹*L.D. Landau Institute for Theoretical Physics Russian Academy of Sciences, Chernogolovka, Russia*, ²*Moscow Institute of Physics and Technology, Dolgoprudny, Russia*, ³*All-Russia Research Institute of Automatics, Rosatom, Moscow, Russia*, ⁴*Joint Institute for High Temperatures, Russian Academy of Sciences, Moscow, Russia*, ⁵*University of Florida, Gainesville, FL, USA*

Dynamics and Diagnostics of Photo-Excited Processes

We-P-3

Student

A041

Observation of femtosecond laser ablation process in nano-seconds region by soft x-ray shadow graph, Naoya Kakimoto¹, Takashi Eyama¹, Takuro Tomita¹, Noboru Hasegawa², Masaharu Nishikino², Yasuo Minami³, Ryota Takei³, Motoyoshi Baba³, Takeshi Kaihori², Toshimasa Morita², Yusuke Hirano², Tetsuya Kawachi², Mitsuru Yamagiwa², Tohru Suemoto³, ¹*Faculty of Engineering, The University of Tokushima, Japan*, ²*Quantum Beam Science Directorate, Japan Atomic Energy Agency, Japan*, ³*Institute for Solid State Physics, The University of Tokyo, Japan*

Photo/Laser-Induced Desorption from Surfaces

We-P-4

Student

A108

Surface analysis by photo-stimulated desorption using tunable VUV radiation, Daichi Kai¹, Masahito Katto², Masanori Kaku¹, Atsuhiko Yokotani¹, Shoichi Kubodera¹, Wataru Sasaki³, ¹*Faculty of Engineering and Photon Science Project, Univ. of Miyazaki, Japan*, ²*Center for CRCC and Photon Science Project, Univ. of Miyazaki, Japan*, ³*NTP, Inc., Japan*

Deposition and coating of thin films, multilayers, and nanostructured materials

We-P-5

Student

A031

Growth of ZnO nanowall and UV lasing characteristic, Kosuke Harada¹, Shihomi Nakao¹, Masahiro Takahashi¹, Mitsuhiro Higashihata¹, Hiroshi Ikenoue¹, Daisuke Nakamura¹, Yoshiki Nakata², Tatsuo Okada¹, ¹*Grad. Sch. ISEE, Kyushu Univ., Japan*, ²*Inst. Laser Eng., Osaka Univ., Japan*

We-P-6

A061

Control of metal-insulator transition of VO₂ thin film grown by excimer laser-assisted sputtering process, Haruo Ishizaki¹, Tomohiko Nakajima¹, Kentaro Shinoda¹, Tetsuo Tsuchiya¹, ¹*National Institute of Advanced Industrial Science and Technology (AIST), Japan*

We-P-7

Student

A105

Synthesis of SiC-layered diamond like carbon films on Si substrates by pulsed laser deposition, Yoshiki Aoyagi¹, Satoshi Kurumi², Kaoru Suzuki², ¹*Graduate student of Electrical Engineering, College of Science and Technology, Nihon University, Japan*, ²*Department of Electrical Engineering, College of Science and Technology, Nihon University, Japan*

Synthesis of Nanomaterials

We-P-8 A002

Synthesis of stable nanocolloid by laser ablation at air-suspension, Tepei Nishi¹, Yusuke Akimoto¹, Naoko Takahashi¹, Kousuke Kitazumi¹, Shuji Kajiya¹, ¹*TOYOTA CENTRAL R&D LABS., INC, Japan*

We-P-9 A068

Reactive fabrication of titanium compound spherical particles by pulsed laser melting in liquid from raw particle mixture, Yoshie Ishikawa¹, Naoto Koshizaki², ¹*National Institute of Advanced Industrial Science and Technology (AIST), Japan,* ²*Hokkaido University, Japan*

We-P-10 *Student* A102

Fabrication of optical waveguide inside transparent silica xerogel containing PbS quantum dots using femtosecond laser, Tomoya Tanaka¹, Seisuke Nakashima^{1,2}, Kohki Mukai¹, ¹*Yokohama National University, Japan,* ²*RIKEN – Advanced Science Institute, Japan*

Plasmon-Enhanced Photon/Laser Processing

We-P-11 A082

Optical trapping of nanoparticles based on plasmonic nanohole arrays, Tatsuya Shoji¹, Yasuyuki Tsuboi¹, ¹*Osaka City University, Japan*

Cutting, Drilling, Surface Patterning and Micromachining

We-P-12 A001

Maskless laser patterning of graphene ink imprinted on glass substrates by using beam shaping technology, Chien-Kai Chung¹, Wen-Tse Hsiao¹, Donyau Chiang¹, Tien-Li Chang², Shih-Feng Tseng¹, Jer-Liang Andrew Yeh^{1,3,4}, ¹*Instrument Technology Research Center, National Applied Research Laboratories, Taiwan,* ²*Department of Mechatronic Engineering, National Taiwan Normal University, Taiwan,* ³*Institute of Nanoengineering and Microsystems, National Tsing Hua University, Taiwan,* ⁴*Department of Power Mechanical Engineering, National Tsing Hua University, Taiwan*

We-P-13 *Student* A022

Fundamental study of direct micro porous process using laser shockwave, Moon-Suk Kang¹, Jae-Yong Oh², Yong-Won Ma¹, Bo-Sung Shin³, ¹*Department of Cogno-mechatronics Engineering, Pusan National University, Korea,* ²*Engineering Research Center for Net Shape and Die Manufacturing, Pusan national University, Korea,* ³*Department of Nano-fusion Engineering, Pusan National University, Korea, Korea*

We-P-14 A046

Numerical simulation about effect of background gas of laser processing of CFRP, Tomomasa Ohkubo¹, Masahiro Tsukamoto², Yuji Sato², ¹*School of Media Science, Tokyo University of Technology, Japan,* ²*Smart Beam Processing Research Center, Joining and Welding Research Institute, Osaka University, Japan*

Surface Nanostructuring and Nanoripple Formation

We-P-15 A059

Self-cleaning superhydrophobic black metals produced by femtosecond laser processing, Anatoliy Vorobyev¹, Chunlei Guo¹, ¹*University of Rochester, USA*

3D Additive Manufacturing

We-P-16 A099

Single mode fiber laser induced selective laser melting of Ti6Al4V powder , Yuji Sato¹, Masahiro Tsukamoto¹, Yorihiro Yamashita², ¹*Joining and Welding Research Institute, Osaka University, Japan,* ²*Industrial Research Institute of ISHIKAWA, Japan*

Interactions with Organic and Biomaterials and Applications including MALDI and Laser Microprobe Mass Analysis

We-P-17

A095

Clean laser transfer of fibronectin: Protein quantification and embedding in polymeric matrix, Felix Sima¹, Emanuel Axente¹, Joseph Dentzer², Roger Gadiou², Karine Anselme², Olivier Gallet³, Ion N Mihailescu¹, ¹*Lasers Department, National Institute for Lasers, Plasma and Radiation Physics, Bucharest-Magurele, Romania, Romania*, ²*IS2M, CNRS UMR7361, Mulhouse, France, France*, ³*ERRMECE, Cergy-Pontoise University, Cergy-Pontoise, France, France*

Medical and Biological Applications

We-P-18 *Student*

A024

Microfluidics fabrication of conventional glass slide using femtosecond laser for fluorescence detection of single cell, Takuma Niioka¹, Yasutaka Hanada^{1,2}, Koji Sugioka², Katsumi Midorikawa², ¹*Hirosaki University, Japan*, ²*RIKEN, Japan*

We-P-19

A084

Nano-machining of bio-sensor electrodes through gold nanoparticles deposited by femtosecond laser ablation, B. Della Ventura¹, R. Funari², K. K. Anoop^{2,3}, S. Amoruso^{2,3}, C. Altucci², R. Velotta², ¹*Dipartimento di Fisica, Università degli Studi di Roma "La Sapienza", Piazzale Aldo Moro 5, I-00185 Roma, Italy*, ²*Dipartimento di Fisica, Università degli Studi di Napoli Federico II, Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*, ³*CNR-SPIN, UOS Napoli Complesso Universitario di Monte S. Angelo, Via Cintia I-80126 Napoli, Italy*

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