Special Session 3
Ultrafast Pulse Laser Processing

Organised by: Koji Sugioka (RIKEN-, Japan)

Ultrafast pulse laser processing opens up new avenue for micromachining of hard materials as well as soft materials and internal modification of transparent materials. The aim of this session is to provide a forum for discussion of both the fundamental aspects and applications based on the latest results of ultrafast pulse laser processing.

Wednesday 29 May, MO Hall

16:00	**Opening Remark Koji Sugioka (RIKEN) 16:00-16:05**
16:05	**Session 1: Fundamental Aspects (16:05-17:55)**
	• **Mechanism of ultrashort pulse laser ablation (Invited Paper),** S.I. Anisimov, Landau Inst. For Technical Physics (Russia) [006] • **Femtosecond laser ablation of Copper: Imaging expansion dynamics of the plasma,** Y. W. Goh, Y. F. Lu, M. H. Hong, T. C. Chong, Data Storage Institute, National University of Singapore (Singapore) [089] • **Study on optical properties of ultra-short-pulse laser heated material,** Satoru Ohta[*1], Hitoki Yoneda[*1], Ken-ichi Ueda[*1], Richard More[*2], [1]Institute for Laser Science, University of Electro-communications, [2] National Institute for Fusion Science (Japan) [283] • **On possible microscopic mechanisms of femtosecond laser interaction with transparent solids,** Vitali E.Gruzdev, State Research Center S.I.Vavilov State Optical Institute St.Petersburg (Russia) [131] • **Model of Surface Clustering Caused by Intense Femptosecond Laser Pulses,** Alexander Volkov, Michael Sorokin, Russian Research Centre (Russia) [064]

Thursday 30 May, MO Hall

9:00	**Session 2: Advanced Technology (9:00-10:30)**
	• **Femtosecond technology for precision manufacturing: Fundamental and technical aspects (Invited Paper),** Friedrich Dausinger, Institut fur Strahlwerkzeuge (IFSW), University of Stuttgart (Germany) [255] • **Temporal pulse shaping in ultrafast laser material processing**, Razvan Stoian, Mark Boyle, Andreas Thoss, Arkadi Rosenfeld, Georg Korn, and Ingolf V Hertel, Max-Born In-stitut fur Nichtlineare Optik und Kurzzeitspektroskopie (Germany) [195] • **Synthesis of Ultrafast Pulse Trains for Micro-Machining**, Ihtesham Chowduhry, Xianfan Xu, Purdue University (USA) [250] • **Fabrication of micro and cyclic structure by using diffractive optics abd femtosecond laser**, Yoshiki Nakata, Tatsuo Okada, Kyushu University (Japan) [296]
10:30	**Coffee Break** (10:30-10:50)
10:50	**Session 3: Surface Structuring (10:50-12:40)**
	• **Surfacing of freeforms by laser radiation (UV, VIS, NIR) of small (FS, PS, NS) pulse length (Invited Paper),** E. W. Kreutz, Lehrstuhl fur Lasertechnik, RWTH Aachen (Germany) [295] • **Femtosecond studies of highly excited electrons and surface texturing in metals,** Kai Dou, E. T. Knobbe, Oklahoma State University; B. Irwin, R. L. Parkhill, Sciperio, Inc (USA) [065] • **Surface texturing of metals with sub-micron precision using a short pulse UV laser**, J. Bekesi, J.-H. Klein-Wiele, D. Schaefer, J. Ihlemann, P. Simon, Laser-Laboratorium Goettingen (Germany) [071] • **Surface structuring of metals with ultrashort laser pulses**, Michael Weikert, Christian Fohl, Friedrich Dausinger, Institut fur Strahlwerkzeuge (IFSW), University of Stuttgart (Germany) [256] • **Ultrafast Laser Microstructuring for X-Ray Optics**, D.G. Papazoglou, A. Manousaki, I. Zergioti, C. Fotakis, Foundation for Research and Technology-Hellas (Greece); E., Majkova, S. Luby, Slovak Academy of Sciences (Slovakia) [262]
12:40	**Lunch** (12:40 - 14:00)

14:00	**Session 4: Metal Processing (14:00-15:30)**
	• **Femtosecond laser hole drilling in an ambient environment (Invited Paper),** Martin C. Richardson, Univ, of Central Florida (USA) [007] • **Characteristics of Effluent from Femtosecond Pulse Ablation of Metals**, Keng H. Leong, Tara Y. Plew, Penn State ARL Electro-Optics S&T Center; Larry A. Walker II, Robert L. Maynard, Clark-MXR, Inc (USA) [077] • **Femtosecond Ablation of Metals in Gaseous Environments,** W. Perrie and W. O'Neill, University of Liverpool (UK) [133] • **Role of gas environment in the process of deep hole drilling by ultra-short laser pulses**, V. I. Konov, S. M. Klimentov, T. V. Kononenko, P. A. Pivovarov, S. V. Garnov, General Physics Institute Moscow (Russia); F. Dausinger, D. Breitling, IFSW, University of Stuttgart (Germany) [082]
15:30	**Coffee Break** (15:30 - 16:00)
16:00	**Session 5: Ceramics & Semiconductor Processing (16:00-17:20)**
	• **Femtosecond-laser-induced nanostructures formed on hard coatings of TiN and DLC**, N. Yasumaru, Fukui National College of Technology; K. Miyazaki, Kyoto University; J. Kiuchi, Eyetec Co., Ltd.; H. Magara, Industrial Technical Center of Fukui Pref. (Japan) [070] • **Development of Dicing Technique for Thin Semiconductor Substrates with Femtosecond Laser Ablation,** Kosuke Kawahara, Yasunobu Kurogi, Naoyuki Matsuo, Atsushi Yokotani, Kou Kurosawa, Miyazaki University; Takafumi Ninomiya, Hiroshi Sawada, NEC Machinery Corporation (Japan) [079] • **Speed Rate Improvement for Microcutting of Thin Silicon with Femtosecond Laser Pulses**, E. H. Mult, H. K. Tonshoff, A. Ostendorf, K. Korber, N. Barsch, Laser Zentrum Hannover e.V. (Germany) [069] • **Microstructuring of Si_3N_4 and SiC by laser ablation with pulse duration from ns to fs range**, Ernst Wolfgang Kreutz, Ralph Wagner, Alexander Horn, Ruth Weichenhain, Lehrstuhl fuer Lasertechnik RWTH Aachen, (Germany) [200]

Friday 31 May, MO Hall

9:00	**Session 6: Micromachining and Biological Applications (9:00-10:30)**
	• **Femtosecond laser micromachining - An overview of the European FEMTO project and other developments (Invited paper),** Nadeem Rizvi, Exitech (UK) [005] • **Overview of medical and biological applications of ultrafast laser pulses**, Holger Lubatschowski, Alexander Heisterkamp, Fabian Will, Thorsten Bauer, Jesper Serbin, Herbert Welling, Laser Zentrum Hannover e.V, Wolfgang Ertmer, Institute of Quantum Optics, University of Hannover, (Germny) [009] • **Nondestructive separation of living yeast cells by femtosecond laser-induced shockwave**, Yoichiroh Hosokawa[1,2], Jun-ichi Takabayashi[1], Hiroshi Masuhara[1], Kazuhito Fujiyama[1], Ta-tsuji Seki[1], Yoshitaka Matsumoto[2], Setsuya Sato[2], [1)]Osaka University; [2)] Electron Co. Ltd., (Japan) [196] • **Femtosecond Laser Microprocessing of Teflon material**, Zengbo Wang, Minghui Hong, Lu Yongfeng, Tow Chong Chong, Laser Microprocessing Group, Data Storage Institute and National University of Singapore (Singapore) [155]
10:30	**Coffee Break** (10:30-10:50)
10:50	**Session 7: Glass Processing (10:50-12:40)**
	• **Nano- and microprocessing in glass using fs laser (Invited paper),** Kazuyoshi Itoh, Osaka University (Japan) [008] • **In-situ Observation of dynamics of plasma formation and refractive index modification in silica glasses excited by a femtosecond laser,** Sung-Hak Cho, Hiroshi Kumagai, Katsumi Midorikawa, RIKEN (Japan) [302] • **Micro-Hole Drilling on Glass Plates by Femtosecond Laser Pulses,** Noriyuki Kuriyama, Yoshiro Ito, Nagaoka University of Technology (Japan) [148] • **Control of positions and shapes of voids in transparent materials with femtosecond laser pulses**, Wataru Watanabe, Kazuhiro Yamada, Daisuke Kuroda, Taishi Shinagawa, Kazuyoshi Itoh, Osaka University; Junji Nishii, National Institute of Advanced Industrial Science and Technology (Japan) [091] • **3-D Microfabrication in Photosensitive Glass by Femtosecond Laser**, Masashi Masuda, Naoko Aoki, RIKEN, Science Univesity of Tokyo; Ya Cheng, Koji Sugioka, Katsumi Midorikawa, RIKEN; Koichi Toyoda, Science University of Tokyo; Masako Kawachi, Kazuhiko Shihoyama, HOYA Continuum Corporation (Japan) [086]
12:40	**Closing Remark Koji Sugioka (RIKEN) (12:40-12:45)**
12:45	**Lunch** (12:45 - 14:00)