PICALO

PACIFIC INTERNATIONAL CONFERENCE ON APPLICATIONS OF LASERS & OPTICS

March 23-25, 2010

Shangri-La Hotel – Wuhan

People's Republic of China

ADVANCE *Program*

GENERAL CHAIR:

Xiaoyan Zeng, Huazhong University of Science & Technology, Wuhan, People's Republic of China

GENERAL CO-CHAIRS:

Bo Gu, IPG Photonics Corporation, Oxford, Massachusetts, USA

Yongfeng Lu, University of Nebraska-Lincoln, Lincoln, Nebraska, USA

Andreas Ostendorf, Ruhr-University of Bochum, Bochum, Germany

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Minlin Zhong, Tsinghua University, Beijing, People's Republic of China

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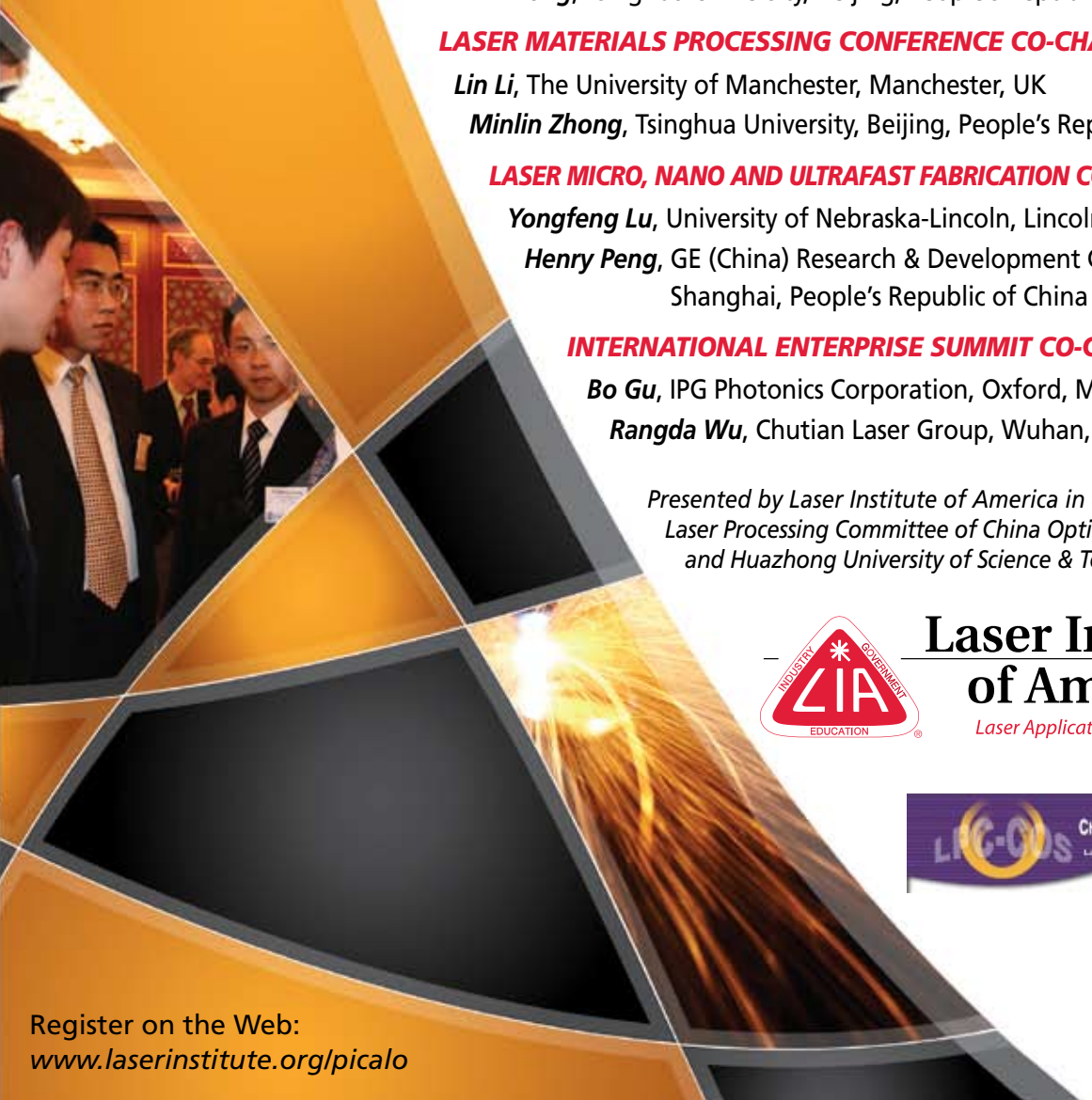
Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China

INTERNATIONAL ENTERPRISE SUMMIT CO-CHAIRS:

Bo Gu, IPG Photonics Corporation, Oxford, Massachusetts, USA

Rangda Wu, Chutian Laser Group, Wuhan, People's Republic of China

Presented by Laser Institute of America in cooperation with Laser Processing Committee of China Optical Society (LPC-COS) and Huazhong University of Science & Technology.



Laser Institute of America

Laser Applications and Safety

China Optical Society

Register on the Web:
www.laserinstitute.org/picalo

PICALO 2010 Conference Agenda

Tuesday, March 23

8:00am	Registration Desk Opens
9:00am	Plenary Session
10:20am	Morning Break
12:00pm	Lunch
1:30pm	LMP # 1: Cutting, Drilling and Machining
	LMP # 2: Welding I
	LMP # 3: Surface Modification I
	Micro # 1: Laser Fabrication of Photonic Devices
2:50pm	Afternoon Break
5:00pm	Welcome Reception

Wednesday, March 24

8:00am	Registration Desk Opens
9:00am	LMP # 4: Welding II
	Micro # 2: Laser Direct Writing and Nano-devices
	Micro # 3: Laser Micromachining I and Simulations
	International Enterprise Summit
	Poster Presentation Gallery
10:20am	Morning Break
12:00pm	Lunch
1:30pm	LMP # 5: Welding III
	LMP # 6: Additive Manufacturing
	Micro # 4: Laser Micro Structuring
	International Enterprise Summit
2:50pm	Afternoon Break
5:30pm	Laser Industry Vendor Program Reception & Tabletop Display

Thursday, March 25

8:00am	Registration Desk Opens
9:00am	LMP # 7: Industrial Applications
	LMP # 8: Surface Modification II
	LMP # 9: Modeling and Simulation
	Micro # 5: Ultrafast Laser Processing
	Poster Presentation Gallery
10:20am	Morning Break
12:00pm	Lunch
1:30pm	LMP # 10: Lasers, Systems and Optics
	LMP # 11: Welding IV
	LMP # 12: Additive Manufacturing and Surface Modification
	Micro # 6: Micromachining II and Novel Laser Sources
2:50pm	Afternoon Break
6:00pm	Closing Banquet

*Program subject to change

Special Thanks to the PICALO 2010 Cooperating Societies

Beijing Optical Society
Chinese Journal of Lasers
European Laser Institute
Association of Laser Users
European Optical Society

GENERAL CHAIR:
Xiaoyan Zeng

LIA PRESIDENT:
Nathaniel Quick

LIA EXECUTIVE DIRECTOR:
Peter Baker

LIA DIRECTOR OF CONFERENCES:
Gail Loiacono

PICALO ADVANCE PROGRAM

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Xiaoyan Zeng,
Huazhong University of Science & Technology
Wuhan, People's Republic of China

Welcome to PICALO 2010 in Wuhan, China's Optical Valley. PICALO is the bridge connecting researchers, engineers, equipment suppliers, end-users and industry personnel, bringing them face to face to share knowledge, experiences and visions. Laser experts and entrepreneurs with fresh results and the latest progress will converge with end-users in China and Asia to form valuable professional relationships. PICALO 2010 includes two separate conferences, the Laser Materials Processing Conference and the Laser Micro, Nano, and Ultrafast Fabrication Conference, in addition to the International Enterprise Summit, a business-focused forum highlighting laser industry development during the current global financial crisis. Your contributions are crucial to the success of these exciting events!

I invite you to come and enjoy the stimulating and beneficial academic environment and exciting technical program, while making new friends from laser engineering and business circles. Plan to arrive early and stay late for fabulous sightseeing opportunities in and around Wuhan.

PICALO 2010 is organized by Laser Institute of America (LIA) in cooperation with the Laser Processing Committee of China Optical Society (LPC-COS) and Huazhong University of Science and Technology. On behalf of the organizing committee and conference chairs, I would like to formally invite you to attend PICALO in March 23-25, 2010 in Wuhan.

Plenary Session : Superfast Laser / Laser Applications

Although the Optical Valley is located in Wuhan, where the largest laser companies and laser processing system integrators in China are located, it is an unprecedented event for the city to host such a great event as PICALO 2010 during the best season of the year, with the presence of so many world class scientists and engineers with so many fresh ideas and techniques. This conference will provide rich information on advanced science and engineering in laser materials processing, and build a bridge strategically linking Wuhan, China with the rest of the world.

The PICALO 2010 plenary session highlights the theme of "superfast laser / laser applications". This plenary session starts with an impressive talk on multi-hundred-watt femtosecond lasers and their applications in material processing. This type of laser may bring significant novel results which may have profound impact on the future material processing techniques. Femtosecond lasers have significant impacts not only on material processing, but also on the analysis and characterization of different substances, especially in biomedical fields. With a special dispersion compensation scheme, a random scanning two-photon microscope is constructed which is able to track fast neuronal activities that could not be monitored with conventional techniques. The evolution of the femtosecond laser pulses after passing an AOD scanner, and the experiments with models to validate its applications in neuroscience will be presented in the second part of the plenary session.

Laser direct manufacturing of metallic components based on powder deposition has appeared for many years. Its applications have been limited to the fabrication of small metallic components. A challenging question is if it is possible to manufacture large metallic components and push technique into industrial applications. The third plenary talk from Beihang University will give us the answers.

Invited Plenary Speakers:

High-Power Ultra-short Pulse Laser Radiation: New Sources as Key Enablers for Emerging Applications (Keynote Presentation)
Ingomar Kelbassa, RWTH Aachen University

Two-Photon Microscopic Biological Imaging with Femtosecond Laser Pulses
Shaoqun Zeng and Qingming Luo, Huazhong University of Science and Technology

Laser Direct Manufacturing of High-Performance Large Titanium Structural Components for the Aerospace Industries: Challenges and Progresses
H.M. Wang, Beihang University

Digital Microfabrication by Laser Forward Transfer
Alberto Pique, Naval Research Lab

Special Thanks to the Following:

Eckhard Beyer	Fraunhofer IWS, Dresden, Germany
Milan Brandt	Swinburne University of Technology, Melbourne, Australia
Friedrich Dausinger	Institut für Strahlwerkzeuge, Stuttgart, Germany
Shusheng Deng	Laser Processing Committee - China Optical Society, People's Republic of China
Walter W. Duley	University of Waterloo, Waterloo, Ontario, Canada
Naoto Koshizaki	NARC, National Institute of Advanced Industrial Science and Technology, Ibaraki, Japan
Gnian Cher Lim	Singapore Institute of Manufacturing Technology, Singapore
Shangyang Lin	Harbin Welding Institute, Harbin, People's Republic of China
Wenjin Liu	Tsinghua University, Beijing, People's Republic of China
Jyoti Mazumder	CLAIM, The University of Michigan, Ann Arbor, MI, USA
Reinhart Poprawe	Fraunhofer ILT, Aachen, Germany
John Powell	Laser Expertise Ltd., Nottingham, UK
Chris Smallbone	Welding Technology Institute of Australia, Silverwater, Australia
William M. Steen	The University of Liverpool, Liverpool, UK
Maocai Wang	Institute of Metal Research, Shenyang, People's Republic of China
Youliang Wang	Laser Processing Committee - China Optical Society, People's Republic of China
Xichen Yang	Tianjin Polytechnique University, Tianjin, People's Republic of China
Xiao Zhu	Huazhong University of Science and Technology, Wuhan, People's Republic of China
Tiechuan Zuo	Beijing University of Technology, Beijing, People's Republic of China

Wednesday, March 24th

Bo Gu,
IPG Photonics Corporation, Oxford, MA, USA

International Enterprise Summit

Now that 2009 is behind us, people are looking ahead to 2010 searching for signs of economic recovery in the laser industry. The International Enterprise Summit has invited executives and experts from the laser industry worldwide to Wuhan, the "Optical Valley" of China to discuss the current status and future trends of our industry. This session's theme is "Advanced Lasers and Laser Processing Systems." CEOs and CTOs of laser industry will present their latest research and development activities, showcase their new products and predict the markets. The speakers will put forward their insights on how to break through the down turn economic cycle in order to be ready for the future growth. Don't miss this rare opportunity!

Rangda Wu,
Chutian Laser Group, Wuhan, People's Republic of China

Laser Industry Vendor Program Reception & Tabletop Display

Wednesday, March 24th, 5:30pm

The Laser Industry Vendor Program gives vendors and conference attendees the opportunity to discuss equipment and applications in a relaxed setting. After completion of the technical sessions, share refreshments and product ideas with your colleagues and suppliers! Limited space is still available! For more information on participating as a vendor, contact Gail LoIacono at +1.407.380.1553 or email: *picalo@laserinstitute.org*.

The Laser Materials Processing Conference features the latest developments across the world in laser cutting, machining, surface modification, welding, additive manufacturing, laser modeling and simulation, drilling and forming and industrial applications. Technical sessions will include oral and poster presentations. In most subject areas, invited speakers from leading research groups and companies worldwide will present their recent findings and future prospects.

Laser Materials Processing Conference Co-Chairs:

Lin Li, The University of Manchester, Manchester, UK
Minlin Zhong, Tsinghua University, Beijing, People's Republic of China

Laser Materials Processing Conference Committee

Pascal Aubry, CEA, Arcueil, France
Magdi Azer, GE Global Research, Niskayuna, NY, USA
Woong-Seong Chang, RIST, Pohang, South Korea
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Shang Yang Lin, Harbin Welding Institute, Harbin, People's Republic of China
Hau-Chung Man, Hong Kong Polytechnic Univ., Hung Hom, Kowloon, Hong Kong, People's Republic of China
I. Manna, LLT, India, India
Isamu Miyamoto, Osaka Univ., Osaka, Japan
Edward Metzbower, eamweld LLC, Alexandria, VA, USA
Flemming Olsen, Technical Univ. of Denmark, Lyngby, Denmark
Bill O'Neill, Univ. of Cambridge, Cambridge, UK
Rui Vilar, Instituto Superior Técnico, Lisboa, Portugal
Dirk Petring, Fraunhofer ILT, Aachen, Germany
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Antti Salminen, Lappeenranta Univ. of Technology, Lappeenranta, Finland
Yusheng Shi, Huazhong Univ. of Science and Technology, Wuhan, People's Republic of China
G. Sundararajan, International Advanced Research Centre for Powder Metallurgy and New Materials, Andhra Pradesh, India
Frank Vollertsen, BIAS, Bremen, Germany
Huaming Wang, Beijing Univ. of Aeronautics and Astronautics, Beijing, People's Republic of China
Kenneth Watkins, The Univ. of Liverpool, Liverpool, UK
Yixiong Wu, Shanghai Jiaotong Univ., Shanghai, People's Republic of China
Rongshi Xiao, Beijing Univ. of Technology, Beijing, People's Republic of China
Lijue Xue, National Research Council of Canada, London, Ontario, Canada
Yongqiang Yang, Huanan Univ. of Technology, Guangzhou, Guangdong, People's Republic of China
Jianhua Yao, Zhejiang Univ. of Technology, Hangzhou, Zhejiang, People's Republic of China
Y. Lawrence Yao, Columbia Univ., New York, NY, USA
Jianxun Zhang, Xi'an Jiatong Univ., Xi'an, People's Republic of China
Yongkang Zhang, Jiangsu Univ., Zhenjiang, People's Republic of China
Wenwu Zhang, GE Global Research, Schenectady, NY, USA
Hongyu Zheng, Singapore Institute of Manufacturing Technology, Singapore
Norman Zhou, Univ. of Waterloo, Waterloo, Ontario, Canada

LMP Session 1: Cutting, Drilling and Machining

Tuesday, March 23 • 1:30pm

Session Co-chairs: Tony Hoult, IPG Photonics Corporation, West Coast Operations, Santa Clara, CA, USA; Dirk Petring, Fraunhofer ILT, Aachen, Germany

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Tuesday, March 23 • 1:30pm

Session Co-chairs: Eckhard Beyer, Fraunhofer IWS, Dresden, Germany; Shuili Gong, BAMTRI, Beijing, Peoples Republic of China

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Jongkol Iammi, National Metal and Materials Technology Center (Mtec); Janet Folkes, David Hann, The University of Nottingham

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Session Co-chairs: Kenneth Watkins, The University of Liverpool, Liverpool, Great Britain; Minlin Zhong, Tsinghua University, Beijing, People's Republic of China

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LMP Session 4: Welding II

Wednesday, March 24 • 9:00am

Session Co-chairs: Isamu Miyamoto, Osaka University, Hyogo, Japan; Rongshi Xiao, Beijing University of Technology, Beijing, People's Republic of China

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Session Co-chairs: Antti Salminen, Lappeenranta University of Technology, Lappeenranta, Finland; Jianhua Yao, Zhejiang University of Technology, Hangzhou, People's Republic of China

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Aiqin Duan, BAMTRI

LMP Session 6: Additive Manufacturing

Wednesday, March 24 • 1:30pm

Session Co-chairs: Pascal Aubry, CEA, PARIS, France; Ingomar Kelbassa, RWTH Aachen University, Aachen, Germany

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LMP Session 7: Industrial Applications

Thursday, March 25 • 9:00am

Session Co-chairs: Bo Gu, IPG Photonics Corporation, Oxford, MA, USA; Stefan Kaierle, Fraunhofer ILT, Aachen, Germany

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Shuili Gong, BAMTRI

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Session Co-chairs: Weidong Huang, Northwestern Polytechnical University, Xian, Peoples Republic of China; Zhu Liu, The University of Manchester, Manchester, Great Britain

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Qunli Zhang, Jianhua Yao, Baorong Su, Zhejiang University of Technology

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Thursday, March 25 • 9:00am

Session Co-chairs: Mohammed Naeem, GSI Group, Inc. - Laser Division, Rugby, Great Britain; Gary Ng, SIMTech, Manchester, Great Britain

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Nancy (Jihong) Yang, Swinburne University of Technology

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Furong Liu, Beijing University of Technology

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Fanrong Kong, Southern Methodist University

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Pang Shengyong, Chen Liliang, Zhou Jianxin, Yin Yajun, Liu Jianhua, Hu Lunji, State Key Laboratory of Materials Processing and Die & Mould Technology, Huazhong University of Science and Technology

Combined Numerical-Experimental Approach to Design Effective Gas-Dynamic Nozzles for Laser Cutting (907)
Oleg Kovalev, Peter Yudin, Alexander Zaitsev, Institute of Theoretical and Applied Mechanics S.B.R.A.S.

Numerical Simulation of Geometry and Temperature Distribution in Thin Walls during Laser Rapid Manufacturing (908)
C.P. Paul, Atul Kumar, A.K. Pathak, M. Gupta, L.M. Kukreja, Raja Ramanna Centre for Advanced Technology

LMP Session 10: Lasers, Systems and Optics

Thursday, March 25 • 1:30pm

Session Co-chairs: Markus Kogel-Hollacher, Precitec Optronik GmbH/Precitec KG, Rodgau, Germany; William O'Neill, University of Cambridge, Cambridge, Great Britain

Progress in Cutting and Welding of Sheet Metal Assemblies in One Machine with the Laser Combi-Head (Invited Presentation) (1001)
Dirk Petring, Frank Schneider, Fraunhofer ILT; Harald Dickler, Laserfact GmbH

Development of the Machines and Materials for Rapid Prototyping & Tooling Technologies and 3D Measurement (1002)
Yusheng Shi, Qingsong Wei, Huazhong University of Science and Technology

Investigation of the Mechanism of Different Acoustic Signals Generated During Laser Welding (1003)
Wei Huang, Radovan Kovacevic, Southern Methodist University

The Machine Vision of Powder Stream Concentration Field in Laser Remanufacturing Robot (1004)
Yang Xichen, Chen Xiuping, Laser Processing Center, Tianjin Polytechnical University

Advanced Refractive Beam Shaping Optics for Advanced Laser Technologies (1005)
Alexander Laskin, Molecular Technology (MolTech) GmbH

Beam Shape Optimization for Microwelding and Cutting (1006)
Andy Appleyard, SPI Lasers

Real-Time Power Measurement for High Power Diode Laser (1007)
Yu Song, Institute of Laser Engineering, Beijing University of Technology

Advantages of Adaptive Optics for Laser Metal Deposition in Comparison to Conventional Optics (1008)
Bernd Burbaum, Chen Hong, Ingomar Kelbassa, Lehrstuhl fuer Lasertechnik, RWTH Aachen University

High Power Q-Switched Laser Architectures and CW Diode Pumped Gain Modules (1009)
Jay Doster, Edward Stephens, Northrop Grumman Cutting Edge Optronics

LMP Session 11: Welding IV

Thursday, March 25 • 1:30pm

Session Co-chairs: Yanbin Chen, Harbin Institute of Technology, Harbin, People's Republic of China; Lin Li, The University of Manchester, Manchester, Great Britain

Effect of Heat Input on Autogenous Welding of Duplex Stainless Steel (Invited Presentation) (1101)
Antti Salminen, Lappeenranta University of Technology; Elin Westin, Outokumpu Oyj

Research on Laser-Resistance Hybrid Welding of Aluminum Alloy (1102)
Xinge Zhang, Yanbin Chen, Liquin Li, Zhenglong Lei, Harbin Institute of Technology

Study on Welding Characteristics of Laser-Tig Double-Side Hybrid Welding (1103)
Yanbin Chen, Zhenglong Lei, Harbin Institute of Technology

Influences of Welding Conditions on the Seam Quality During Hybrid Laser-GMAW Butt Welding of Thick Steel Plates (1104)
Shanglu Yang, Southern Methodist University

The Interaction Between Laser Induced Plasma/Vapor and Arc Plasma During Fiber Laser-MIG Hybrid Welding (1105)
Jun Wang, Chunming Wang, Dejian Liu, Xiyuan Hu, Yangchun Yu, Xuanxuan Meng, School of Materials Science and Engineering, Huazhong University College of Science & Technology

Development of a Laser Machine Vision System for Joint Tracking (1106)
Wei Huang, Southern Methodist University

Study on the Stability of Laser Welding Process with Filler Wire (1107)
Jing Yang, Xiaoyan Li, Shuili Gong, Li Chen, Fei Xu, Beijing Aeronautical Manufacturing Technology Research Institute, BAMTRI

Double Electric Path Mechanism of Nd:YAG Laser-Pulse MAG Hybrid Welding (1109)
Wang Wei, Harbin Welding Institute

LMP Session 12: Additive Manufacturing and Surface Modification

Thursday, March 25 • 1:30pm

Session Co-chairs: Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China; Huaming Wang, BAAU, Beijing, People's Republic of China

Laser Net Shape Manufacturing of Ti6Al4V (1201)
Guoshuang Cai, Xiaobin Chen, Yanmin Li, Yong Liu, Henry Peng, GE (China) Research & Development Center Co. Ltd.

Laser Cladding of Aluminium Using Tib2 Powder (1202)
Sanjay Kumar, Sisa Pityana, CSIR, South Africa

Laser Surface Melting of 17-4 Ph Precipitation-Hardenable Stainless Steel (1203)
Zhichao Cheng, Chi Tat Kwok, Kin Ho Lo, Department of Electromechanical Engineering, Faculty of Science and Technology, University of Macau

Study of Laser Cladding with Diode Laser Robotized System (1204)
Jianhua Yao, Qunli Zhang, Zhejiang University of Technology; Volodymyr Kovalenko, Mykola Anyakin, National Technical University of Ukraine KPI

Study on Fibre Laser-MIG Hybrid Welding Process of Aluminum Alloy (1205)
Jun Yan, Xiaoyan Zeng, Ming Gao, Huazhong University of Science and Technology

Improvement of High Temperature Oxidation Resistance of Nial/Al2O3 Electroless Composite Coating by Laser Hardening (1206)
Qingming Ding, Jianhua Yao, Fanzhi Kong, Zhejiang University of Technology

A Binocular Vision System To Measure Width And Height Of Deposited Material In Laser Net-Shape Manufacturing (1207)
Guoshuang Cai, Xiaobin Chen, Henry Peng, GE Global Research; Yanmin Li, GE (China) Research & Development Center Co. Ltd.

Laser Surface Alloying of C-B-W-Cr Powders on Nodular Cast Iron Rolls (1208)
Guifang Sun, Advanced Forming Technology Institute, Jiangsu University; Changsheng Liu, Northeastern University

Study on the Dimension Precision of the Metal Parts Fabricated by Selective Laser Melting Process (1209)
Yusheng Shi, Li Wang, Zhigang Wang, Qingsong Wei, HUST

Micro, Nano and Ultrafast Fabrication Conference

New laser technologies for micro/nano/ultrafast fabrication and diagnosis continue to be the focus of academic research and industry applications. The explosion of new ideas in the photonics, electronics, energy conversion, material processing, microelectonics packaging and biomedical fields has created a unique need for fabrication and diagnostics at micro/nanoscales using continuous wave, nanosecond, picosecond and femotosecond lasers. The Laser Micro, Nano and Ultrafast Fabrication Conference at PICALO® 2010 is a global forum for engineers and scientists from a variety of industry segments and research institutes to meet and discuss use of laser micro/nano/ultrafast fabrication and diagnosis as a key technology for various applications. Attendees will find innovative ideas and solutions for micro/nano/ultrafast fabrication in opto- and microelectronics, electronics, microsystems, material processing and biomedical industries. This conference will highlight new and exciting achievements in structuring with highest precision using laser pulses from the nanosecond down to the picosecond and femtosecond time regime. Special sessions are dedicated to laser fabrication of photonic devices, laser direct writing of nanodevices, laser micromaching/microstructuring, ultrafast laser processing and novel laser sources. In this way, we may highlight the newest developments and their promising perspectives. Outstanding researchers will give keynote and invited presentations in order to provide a deep insight into the current research work in these fields.

Micro, Nano and Ultrafast Fabrication Conference Co-Chairs:

Yongfeng Lu, University of Nebraska-Lincoln, Lincoln, Nebraska, USA
Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China

Laser Micro, Nano and Ultrafast Fabrication Committee

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Koji Sugioka, RIKEN, Saitama, Japan
Hong-Bo Sun, Jilin Univ., Changchun, Jilin, People's Republic of China
Hai-Lung Tsai, Univ. of Missouri-Rolla, Rolla, MO, USA
Kunihiko Washio, Paradigm Laser Research Ltd, Machida, Tokyo, Japan
Xianfan Xu, Purdue Univ., West Lafayette, IN, USA
Qingmao Zhang, South China Normal Univ., Guangzhou, People's Republic of China
Ming Zhou, Jiangsu University, Zhenjiang, People's Republic of China

Micro Session 1: Laser Fabriciation of Photonic Devices

Tuesday, March 23 • 1:30pm

Session Co-chairs: Lan Jiang, Beijing Institute of Technology, Beijing, People's Republic of China; Yongfeng Lu, University of Nebraska - Lincoln, Lincoln, NE, USA

Fabrication of Three-Dimensional Photonic Components in Transparent Substrates Using High-Repetition Rate Femtosecond Ultrafast Laser (Invited Presentation) (M101)
Kevin Chen, University of Pittsburgh

Synthesis and Characterization of Zno Nano-Crystals by Nanoparticle-Assisted PLD and Their Application to Light Emittting Devices (Invited Presentation) (M102)
Tatsuo Okada, Kyushu University

Multiple Beam Ultrafast Laser Microprocessing (Invited Presentation) (M103)
Jian Cheng, Geoff Dearden, Stuart Edwardson, Eamonn Fearon, Zheng Kuang, Dun Liu, Walter Perrie, Shuo Shang, University of Liverpool

Ultrafast Laser Nanofabrication with Multimodal Spectroscopic Microscopy (M104)
Jianzhao Li, Dagmar Esser, Saeid Rezaei, Peter R. Herman, Electrical and Computer Engineering, University of Toronto

TBA (Invited Presentation) (M105)
Costas Grigoropoulos, University of California - Berkeley

Interative Laser Bandgap Nanoengineering of III-V Quantum Well and Quantum Dot Wafers (Invited Presentation) (M106)
Jan J. Dubowski, Université de Sherbrooke

Laser Selective Patterning of Multi-Layers Thin-Film Organic Polymers for Solar Cell Interconnection (M107)
Shizhou Xiao, Ralf Nett, Andreas Ostendorf, Laser Applications Technology

Picosecond Laser Scribing for Thin-Film Solar Cell Manufacturing (M108)
Gediminas Raciukaitis, Ekspla Ltd. & Institute of Physics; Paulius Gecys, Romualdas Trusovas, Institute of Physics; Raimundas Kondrotas, Ekspla Ltd.

Laser Machining Technology Applied in Solar Panels (M109)
He Chao, Beijing University of Technology

Micro Session 2: Laser Direct Writing and Nano-Devices

Wednesday, March 24 • 9:00am

Session Chair: Costas Grigoropoulos, University of California - Berkeley, Berkeley, CA, USA

Shaping Laser Interactions For Direct-Write Processing (Invited Presentation) (M202)
Craig Arnold, Princeton University

Organic Light Emitting Material Direct Writing by Nanomaterial Enabled Laser Transfer (M203)
Seung Hwan Ko, Yoonsoo Rho, Junyeob Yeo, Kaist; Heng Pan, Costas Grigoropoulos, UC- Berkeley

High Signal-To-Noise Ratio Four-Dimensional Storage Using Femtosecond Pulsed Laser (M204)
Yanlei Hu, Wenhao Huang, University of Science and Technology of China

Micro-Patterning of Organic Thin-Film Electronic Devices by Ultra-Short Laser (Invited Presentation) (M205)
Yoshiro Ito, Rie Tanabe, Department of Mechanical Engineering, Nagaoka University of Technology; Masahiro Ichihara, Eiichi Matsumoto, R&D Center, Tokki Corporation

Application of Adaptive Optics to Nanosecond Pulsed Laser Micro-Machining (Invited Presentation) (M206)
Duncan Hand, Heriot-Watt University

High Precision Femtosecond Laser Fabrication for Micro-Nanodevices (Invited Presentation) (M207)
Hong-Bo Sun, Jilin University

Optically Controlled Assembly of Single-Walled Carbon Nanotube Devices (M208)
Wei Xiong, Y.S. Zhou, M. Mahjouri-Samani, M. Mitchell, Y.F. Lu, University of Nebraska-Lincoln

Micro Session 3: Laser Micromachining I and Simulations

Wednesday, March 24 • 9:00am

Session Co-chairs: Craig Arnold, Princeton University, Princeton, NJ, USA; Alberto Pique, Naval Research Laboratory, Washington D.C., USA

Formation of Periodic Nanostructures During Femtosecond Laser Ablation of Ceramic (Invited Presentation) (M301)
Sungho Jeong, Gwangju Institute of Science and Technology

Nanostructuring Solid Surface with Femtosecond Laser Irradiations (Invited Presentation) (M302)
Mengyan Shen, University of Massachusetts, Lowell

Process Competition in the Micromachining of Brittle Components (M303)
Kristian Andreini, Magdi Azer, Peter J. Bednarczyk, Nitin Gard, Steven R. Hayashi, J. Eric Tkaczyk, GE Grc; Haochuan Jiang, GE Healthcare; Wenwu Zhang, GE Global Research

High Precision Femtosecond Laser Prototyping of Micro-Optical Components (M304)
Qi-Dai Chen, Jilin University

Femtosecond Laser Fabrication of Fiber Microresonator Sensors: Experiments and Modeling (Invited Presentation) (M305)
Xin Li, Lan Jiang, Sumei Wang, Beijing Institute of Technology; Yongfeng Lu, University of Nebraska-Lincoln; Hai-Lung Tsai, Hai Xiao, Missouri University of Science and Technology

Shock Waves in Laser-Assisted Near-Field Surface Nanostructuring (Invited Presentation) (M306)
Xinwei Wang, Iowa State University

Molecular Dynamics Simulations of Femtosecond Pulse Laser Ablation of Metal Films (M307)
Xiaodong Wang, Jinsong Liu, Shenglie Wang, Wuhan National Laboratory for Optoelectronics, Huazhong University of Science and Technology

Modeling and Investigating of Shock Pressure for Microscale Laser Shock Processing (M308)
Zhigang Che, Shuili Gong, Shikun Zou, Ziwen Cao, Liangcai Xiong, Beijing Aeronautical Manufacturing Technology Research Institute (BAMTRI)

Micro Session 4: Laser Micro Structuring

Wednesday, March 24 • 1:30pm

Session Co-chairs: Yoshiro Ito, Nagaoka University of Technology, Nagaoka, Niigata, Japan; Xinwei Wang, Iowa State University, Ames, IA, USA

Material Discovery with High Throughput Pulsed Laser Deposition (Invited Presentation) (M401)
Samuel Mao, Lawrence Berkeley National Lab

Ultrafast Laser Processing of Nanomaterials in Liquids for Biomedical Applications (Invited Presentation) (M402)
Michel Meunier, Ecole Polytechnique

Micro Machining Applications in Semiconductor, Photovoltaics and Flat-Panel-Display Industry (M403)
Sascha Weiler, TRUMPF Laser- und Systemtechnik

Excimer Laser-Induced Quantum Well Intermixing in SiO2 Coated InP/InGaAs/InGaAsP Microstructures (M404)
Neng Liu, Khalid Moumanis, Jan J. Dubowski, Université de Sherbrooke

Laser-Assisted Surface Functionalization (Invited Presentation) (M405)
Wilhelm Pfleging, Robert Kohler, Michael Stueber, Sven Ulrich, Michael Bruns, Johannes Schneider, Alexander Welle, Karlsruhe Institute of Technology

Generation of Hydrophobic Cones on Polyimide by Nd:YLF Texturing (Invited Presentation) (M406)
Brandon Least, David Willis, Southern Methodist University

Femtosecond Laser Induced Superhydrophobic Transformation on Metal Surface (Invited Presentation) (M407)
Ming Zhou, Jiangsu University

Superhydrophobic Surfaces with Microscale and Nanoscale Structures Prepared by Femtosecond Laser (M408)
Wenjun Wang, Gedong Jiang, Xuesong Mei, Kedian Wang, Chengjuan Yang, Xi'An Jiaotong University

Micro, Nano and Ultrafast Fabrication Conference

Micro Session 5: Ultrafast Laser Processing

Thursday, March 25 • 9:00am

Session Co-chairs: Kevin Chen, Beijing Golden Way Scientific Co., Ltd., Beijing, People's Republic of China; Koji Sugioka, RIKEN, Saitama, Japan

Femtosecond Laser-Driven Shock Quenching of High-Pressure Phases of Materials (Invited Presentation) (M501)
Tomokazu Sano, Osaka University

Forming Limit and Fracture Mode of 3D Micro-Nanoscale Laser Dynamic Forming (Invited Presentation) (M502)
Gary Cheng, Purdue University

Several Novel Applications of Femto Second Laser (M503)
Jeng Ywan Jeng, National Taiwan University of Science and Technology

3D Nano and Micro Structures in Transparent Materials by In-Volume Femtosecond Laser Processing (Invited Paper) (M504)
Dennis Beckmann, Dagmar Esser, Jens Gottmann, Maren Hörstmann-Jungemann, Martin Hermans, Ingomar Kelbassa, Dirk Wortmann, RWTH Aachen University

Nanoaquarium Fabricated by Femtosecond Laser 3D Micromachining: Investigation on Phormidium Assemblage (Invited Presentation) (M505)
Koji Sugioka, Yasutaka Hanada, Katsumi Midorikawa, Hiroyuki Kawano, Ikuko Ishikawa, Riken - ASI; Atsushi Miyawaki, Riken - BSI

Machining of Optical Freeform Optics (Invited Presentation) (M506)
Fengzhou Fang, Tianjin University

Robust Optical Fiber Grating Achieved with Femtosecond Laser Exposure (M507)
Chao Chen, Hong-Bo Sun, Jilin University

Effects of Electron-Phonon Coupling Strength and Electron Density of States on Depth of Nanograting Structures Induced by Intense Femtosecond Pulsed Laser (M508)
Zhihua Li, Haiyan Gao, Haixia Li, Huazhong University of Science and Technology

Micro Session 6: Micromachining II and Novel Laser Sources

Thursday, March 25 • 1:30pm

Session Co-chairs: Samuel Mao, Lawrence Berkeley National Lab, Berkeley, CA, USA; Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China

Novel Fusion Welding Technology of Glass Using Ultrashort Pulse Lasers (Invited Presentation) (M601)
Isamu Miyamoto, Osaka University; K. Cvecek, M. Schmidt, Bayerisches Laserzentrum GmbH; Y. Okamoto, Okayama University

Selective Laser Melting for Rapid Prototyping of Medical Devices (Invited Presentation) (M602)
Yongqiang Yang, South China University of Technology

Progress in Laser-Induced Backside Wet Etching (Invited Presentation) (M603)
Hiroyuki Niino, AIST

High Throughput Micro Machining Due to Parallel Laser Processing (M604)
Oliver Haupt, Rainer Kling, Frank Siegel, Laser Zentrum Hannover e.V.

Photovoltaic and Semi-Conductor Applications: Advantages of Using a Low M^2, Short Pulse Width, High Average Power and High Repetition Rate Q-Switched Nanosecond DPSS Laser (Invited Presentation) (M605)
Rajesh Patel, Spectra Physics, Division of Newport Corporation

Micro-machining with Nanosecond Pulsed Fiber Laser Beams (Invited Presentation) (M606)
Jack Gabzdyl, SPI Lasers

A New, Flexible Ultrafast Laser for Process Development in Micromachining Applications (M607)
Eric Mottay, Antoine Courjaud, Martin Delaigue, Amplitude Systemes

Properties and Industrial Applications of Picosecond Laser (M608)
Jianke Di, Liang Guo, Haibin Xu, Yuxing Zhao, Suzhou Delphi Laser Co, Ltd.

Fiber Lasers for Micro-Machining Tasks (M609)
Tony Hoult, IPG Photonics Corporation

Poster Presentation Gallery

Poster Presentation Gallery

Wednesday, March 24th and Thursday, March 25th

Laser Patterning in Thin Film Solar (P102)
Wang Minfeng, Zhao Yuxing, Suzhou Delphi Laser Co., Ltd.

Laser Scribing of Thin Film Solar Panels (P103)
Xiangyang Song, JPSA

Ultrafast Laser Microprocessing of Metal and Silicon at 1030 Nm and 515 Nm (M103)
Charly Loumena, John Lopez, Alphanov; Yoann Zaouter, Martin Delaigue, Eric Mottay, Amplitude Systemes

Development and the Application of the Ships Using the Advanced Optical Material (P105)
Zhang Yu, Luoyang Ship Material Research Institute

Nanoparticle Selective Laser Sintering for Large Area Flexible Electronics Fabrication with a Scanning Mirror (P106)
Seung Hwan Ko, Junyeob Yeo, Kaist; Nico Hotz, Heng Pan, Costas Grigoropoulos, UC Berkeley

Ultraviolet Laser Characteristic and Its Application in Laser Processing (P107)
Jianke Di, Yuxing Zhao, Liang Guo, Haibin Xu, Suzhou Delphi Laser Co., Ltd.

Effects of Tailored Nanosecond Pulsed Fiber Laser Beam Modes on Micro-Machining. (P108)
Jack Gabzdyl, SPI Lasers

Application of Femtosecond Optical Frequency Comb's Temporal Coherence Character to a Distance Estimation (P109)
Dong Wei, Satoru Takahashi, Kiyoshi Takamasu, Hirokazu Matsumoto, The University of Tokyo

Rapid Prototyping of Gas Sensor on Alumina Substrate by Laser Micro Cladding Electronic Materials (P110)
Xiaoyan Zeng, Wuhan National Laboratory for Optoelectronics; Cai Zhixiang, Huazhong University of Science and Technology

A Study of 355Nm DPSS UV Laser Micromachining for Silicon Wafer (P111)
Fei Zhang, Jun Duan, Xiaoyan Zeng, Xiangyou Li, Huazhong University of Science and Technology

Study on Microscale Laser Peen Forming of Copper Foil Based on Numerical Simulation and Orthogonal Experimental Design (P112)
Chao Zheng, Sheng Sun, Zhong Ji, Jing Liu, Wei Wang, Shandong University

Dynamic Fractures in Microscale Laser Peen Forming (P113)
Jing Liu, Zhong Ji, Chao Zheng, Wei Wang, Shandong University

Refractive Micro-Optical Components Produced by Two-Photon Photopolymerization of Resins (P115)
Xiao-Feng Lin, Hong-Bo Sun, Jilin University

Femtosecond Laser Nanofabrication of Field Effect Transistors from Graphene Oxides (P116)
Li Guo, Hong-Bo Sun, Jilin University

Three-Dimensional Metal Nanowiring by Femtosecond Laser-Induced Photoreduction from Solution (P117)
Bin-Bin Xu, Hong-Bo Sun, Jilin University

Beam Shaping of Vertical Cavity Surface Emitting Laser Diodes by Aspheric Microlenses and Microlens Arrays (P118)
Niu, Jilin University

Ablation of Optical Fiber (P119)
Wenbin Hu, Fan Bai, Wuhan University of Technology

Morphological and Optical Properties of Silicon Nanoparticles Grown by Pulsed Laser Deposition (P120)
Lalit Kukreja, R R Centre for Advanced Technology

Theoretical Study of Spontaneous Polarization in BiFeO3 Crystal (P121)
N. Sisodia, H.S. Dagar, P. Sen, Holkar Science College

KRF Laser Irradiation Effect on Properties of ZNO Thin Films (P122)
Yan Zhao, Bejing University of Technology

Laser in Satellite Remote Sensing (P123)
Mohammad Anwar, Dhaka University

Selective Laser Sintering: Recent Advances (P124)
Sanjay Kumar, CSIR, South Africa

Analytical Calculation of Laser Surface Hardening with a Circle Beam (P125)
Binggong Yan, Jichang Liu, Hunan University

Using EAM to Simulate Interaction of Intense Laser LIBS in Lead (P126)
Yinfei Lu, Rao Fu, Guizhong Zhang, Degang Xu, Jianquan Yao, College of Precision Instrument and Optoelectronics Engineering Tianjin University

A New Control System in Laser Hardening (P127)
Caixia Yang, Hunan University

High Accuracy Medium Range Laser Range Finder Design (P128)
Junewen Chen, Chung-Hua University

A Method of Measuring High Temperature Based on Emission Spectrum (P129)
Jianmin Miao, Jianhua Yao, Xiaodong Hu, Chenghua Sui, Zhejiang University of Technology

Research on Compound Treatment of 35CrMoA Steel by Laser Quenching and Nitriding (P130)
Han Bin, Wang Yong, China University of Petroleum

Laser Net Shape Manufacturing Of Superalloy Rene 80 (P131)
Yanmin Li, Yong Liu, Henry Peng, GE (China) Research & Development Center Co., Ltd.

The Processing Techniques for a Novel Non-Planar Four Frequency Ring Laser Gyro (P132)
Jian-Qiang Yang, Dan Liao, College of Opto-Electronics Science and Engineering, National University of Defense Technology; Xin Jin, Chinese Army of No. 91746; Yun Luo, Weaponry Department of Engineering, Naval University of Engineering; Yong Zhu, Academy of Air Force Radar

An Application Study of Galvanometric Scanner with Computer Based Dynamic Focus in Rapid Prototyping (P133)
Wen Shifeng, Huazhong University, College of Science & Technology

Which Laser Source for Micromachining Applications? (P135)
Mohammed Naeem, GSI Group, Inc. - Laser Division

Laser Forming Repair of Ti-6Al-4V Alloys (P136)
Lei Xue, Northwestern Polytechnical University

Study on Directly Forming Metallic Component Through Selective Laser Melting (P137)
Ruidi Li, Yusheng Shi, Zhigang Wang, State Key Laboratory of Material Processing and Die & Mould Technology, Huazhong University of Science and Technology; Jinhui Liu, Modern Manufacture Engineering Center, Heilongjiang University of Science and Technology

Laser Hardening of Ductile Cast Iron (P138)
Jichang Liu, Hunan University

Cutting Glass Substrates in Melting Means with Dual Laser Beams (P140)
Junke Jiao, Changwen Peng, Xiaobo Bai, Ju Dai, Institute of Industry Technology, Guangzhou and Chinese Academy of Sciences; Xinbing Wang, Huazhong University of Science and Technology

Research on Machine Vision of Molten Pool Temperature Field in Laser Remanufacturing Robot (P141)
Xichen Yang, Laser Processing Center, Tianjin Polytechnic University

Effects of Laser Drilling on Rate of Penetration (ROP) for Oil and Gas Wells Drilling (P144)
Mahdi Bakhtbidar, Mohsen Ghorbankhani, Islamic Azad Univeristy Branch of Omidieh

Research of Shielding Gas Flow Field on Laser Coaxial Powder Feeding Nozzle (P145)
Dexian Yi, Fangyou Hu, Naea Qingdao Brach

Fabrication of Metal Network on Titanium Diaphragm for Tweeter Speaker by Laser Selected Surface Alloying (P147)
Aikui Li, (unknown); Xiaoyan Zeng, HUST

Direct Laser Writing System of Mask for Integrated Photonics Devices (P148)
Slimane Messaoud, CDTA; Abdelkrim Allam, Fodil Siserir, Yacine Bouceta, Tahar Kerdja, Tahar Touam, Centre de Developpement des Technologies Avanc Es; Djamel Ouadjaout, Unit de Developpement de La Technologie du Silicium

A New Control System for Laser Cladding (P150)
Jichang Liu, Liusha Yang, Hunan University

Microstructures of Alloyed and Dispersed Hard Particles in the Aluminium Surface (P151)
Sisa Pityana, CSIR National Laser Centre

Femtosecond Laser Internal Structuring of Materials using a Spatial Light Modulator (P152)
Dun Liu, Walter Perrie, Zheng Kuang, S. P. Edwardson, Laser Group; Patricia Scully, A. Baum, Shijie Liang, Anca Taranu, Photon Science Institute

The Effect of Laser Scanning Path on Microstructure and Properties of Laser Solid Formed Nickel-Base Superalloy Inconel 718 (P153)
Fencheng Liu, Xin Lin, Gaolin Yang, Jing Chen, Weidong Huang, Northwestern Polytechnical University

A Review of Laser Assisted Machining of Metals (P154)
Shoujin Sun, Swinburne University of Technology

Synthesis of Doped-Zno Nanowires by Laser Ablation and Their Application to Light Emitting Devices (P157)
Tatsuo Okada, Kyushu University

Femtosecond Laser Micromachined Polymer Surface: Cell Adhesion Study (P159)
Ka Lai Ng, SIMTech; Wai Yee Yeong, School of Materials Science and Engineering, Nanyang Technological University

Optimization of Preparation Parameters and Resistivity of Lifepo4 Thin Films by Pulsed Laser Deposition (P165)
Zhihua Li, Mingtao Huang, Duanming Zhang, School of Physics, Huazhong University of Science and Technology

Femtosecond Laser Induced Superhydrophobic Transformation on Metal Surface (P166)
Ming Zhou, Li Baojia, Li Jian, Yuan Run, Jiangsu University

General Information

Hotel Accommodations

Shangri-La Hotel
700 Jianshe Avenue
Hankou, Wuhan 430015
People's Republic of China
Tel: (86 27) 8580 6868
Fax: (86 27) 8572 5698
Website: www.shangri-la.com

Hotel reservations need to be made directly with the Shangri-La Hotel.

Conference Registration

Registration can be completed in two ways – online or by downloading a PDF registration form from www.laserinstitute.org/picalo

Full conference registration includes: Plenary Session, Technical Sessions, Welcome Reception (Tuesday evening), Vendor Program Reception (Wednesday evening) and a Technical Digest. Conference Proceedings are available for an additional fee. Registration also includes morning and afternoon coffee service, Chinese style lunch, and the PICALO Closing Banquet (Thursday evening).

One Day Conference Registration includes admission to sessions and receptions on that day only. Proceedings are available for an additional fee.

Student Registration includes: Plenary Session, Technical Sessions, Welcome Reception (Tuesday evening), Vendor Program Reception (Wednesday evening) and a Technical Digest. Conference Proceedings are available for an additional fee. Registration also includes morning and afternoon coffee service, Chinese style lunch, and the PICALO Closing Banquet (Thursday evening).

Please contact the LIA Conference Department at picalo@laserinstitute.org for more information about Guest Tickets.

Proceedings

CD-Rom Proceedings will be available on-site (will not be shipped to you). It includes all submitted papers from PICALO – Laser Materials Processing, Micro, Nano & Ultrafast Fabrication and Poster Presentations.

Payment Received by February 1: $115 USD

February 2 – On-site: $125 USD

**Please note: all payments will be processed in US Dollars.*

Special Needs

If you have any special needs that we can address to make your participation more enjoyable, please contact LIA by Phone: +1. 407.380.1553, Fax: +1. 407.380.5588 or Email: *picalo@laserinstitute.org*

Substitutions and Cancellations

We understand that circumstances may occur to prevent you from attending the conference. If you find that you cannot attend PICALO, you have several options:

1. Send a substitute. Substitutions can be made at any time – even on-site at the conference. (Please have the substitute bring your letter of confirmation to the registration desk).
2. Refund of monies. *

**Note: Requests must be made in writing and received on or before February 1. There is a $75.00 processing fee applied to all refunds. All refunds will be processed after the conference. No refunds will be accepted after February 1.*

Average March Temperatures:
High 57°F / 14°C
Low 42°F / 5°C

Fees

Full Conference – Early Bird Registration
(payment received by January 21)

$595 USD Member	$655 USD Non-Member
$595 USD Cooperating Society	$325 USD Student
$250 USD (1,750 CNY) Chinese Citizen	
$224 USD (1,500 CNY) Chinese Citizen Student	

January 22 – February 18

$645 USD Member	$705 USD Non-Member
$645 USD Cooperating Society	$375 USD Student
$290 USD (2,000 CNY) Chinese Citizen	
$265 USD (1,825 CNY) Chinese Citizen Student	

February 19 – On-site

$695 USD Member	$755 USD Non-Member
$695 USD Cooperating Society	$425 USD Student
$315 USD (2,150 CNY) Chinese Citizen	
$290 USD (2,000 CNY) Chinese Citizen Student	

One Day Conference Registration - Early Bird Registration
(payment received by January 21)
$220 USD each day
$150 USD (1,025 CNY) Chinese Citizen

January 22 – February 18
$250 USD each day
$170 USD (1,175 CNY) Chinese Citizen

February 19 – On-site
$285 USD each day
$190 (1,300 CNY) Chinese Citizen

On-site Registration Times

Monday, March 22	2:00pm – 5:00pm
Tuesday, March 23	8:00am – 5:00pm
Wednesday, March 24	8:00am – 5:00pm
Thursday, March 25	8:00am – 12:00pm

**Purchase orders will not be accepted for on-site registration*

PICALO

PACIFIC INTERNATIONAL CONFERENCE ON APPLICATIONS OF LASERS & OPTICS

Mail or Fax to:
Laser Institute of America
13501 Ingenuity Dr., Suite 128
Orlando, FL 32826
Phone: 407.380.1553
Fax: 407.380.5588

For Office Use Only
Date: _____ Amt. Rcv'd _____
ID # _____

❑ Please check here if you are a first time PICALO attendee.

REGISTRATION FORM

All prices in United States Dollars (USD)
Chinese Citizen Registration Prices Available on PICALO registration page.
Register Online at www.laserinstitute.org/picalo

PLEASE PRINT OR TYPE ❑ Prof. ❑ Dr. ❑ Mr. ❑ Mrs. ❑ Ms. ❑ Miss

First Name/M.I./Last Name (Surname): _____

Business Affiliation: _____

Dept./Bldg./Mail Stop/etc.: _____

Street Address or P.O. Box: _____

City/State/Zip (Postal) Code: _____ Country: _____

Telephone (Work): _____ Fax: _____

E-mail: _____

Emergency Contact Name: _____ Telephone: _____

Membership Status: __ LIA Corporate Member __ LIA Individual Member *(Membership must be valid through March to take advantage of member rates).*

___ Check here if you have any special needs and LIA will contact you.
___ Check here if you do not want your name on the published PICALO attendee mailing list.

You may also register online at *www.laserinstitute.org/picalo*

Full Registration

Includes admission to Plenary Session, Technical Sessions, Lunch each day, Welcome Reception, Vendor Program Reception, Closing Banquet & Technical Digest.

Check member status: ❑ LIA ❑ AILU ❑ ELI ❑ European Optical Society ❑ Chinese Journal of Lasers ❑ Beijing Optical Society
Membership # _____

	LIA Member/Cooperating Society	Non-member	Student
Payment postmarked or received by January 21	__ $595 USD	__ $655 USD	__ $325 USD
Payment postmarked or received by Jan. 22 – Feb. 18	__ $645 USD	__ $705 USD	__ $375 USD
Payment postmarked or received by Feb. 19 – On-site	__ $695 USD	__ $755 USD	__ $425 USD

***Student registration – full time students only. Student registration will not be processed without a copy of your valid Student Identification. Please fax to +407.380.5588 Attn: PICALO**

One Day / Two Day Registration

Includes lunch and admissions to events on that day only.

Date(s) must be checked to process registration: ❑ Tuesday March 23 ❑ Wednesday March 24 ❑ Thursday March 25

Payment postmarked or received by January 21	__ $220 USD One Day
Payment postmarked or received by Jan. 22 – Feb. 18	__ $250 USD One Day
Payment postmarked or received by Feb. 19 – On-site	__ $285 USD One Day

Guests

Includes lunch each day, coffee breaks, Welcome Reception, Vendor Program Reception and Closing Banquet.

❑ $130 USD x _____ (# of guests) = $_____ Name of guest(s): _____
(Please provide for nametag purposes)

Proceedings

CD-ROM Proceedings will be available on-site (will not be shipped to you). Includes all submitted manuscripts.

❑ Received by February 1 __ $115 USD ❑ Received February 2 - On-site __ $125 USD

Method of Payment

Payment must accompany registration form to be processed. Confirmation e-mail will be sent within two weeks of receipt.
(Please include registrant's name and PICALO on check.)

❑ VISA ❑ Mastercard ❑ AMEX ❑ Check or Money Order enclosed, Payable to LIA in U.S. Funds, Drawn on a U.S. Bank

Amount Authorized: USD $_____ Credit Card No._____

Name on Card: _____ Exp. Date: _____ Card Security Code*: _____

Authorized Signature: _____ Date: _____

*The card security code (CSC) is a 3- or 4- digit number (not part of the credit card number) that appears on the back of VISA and MasterCard & the front of American Express credit cards. Payment can not be processed without CSC number.

Refund policy: No refunds will be made on cancellations received after February 1st. All requests for refunds must be made in writing. There will be a $75.00 USD processing fee for all refunds. Proceedings will not be refunded.

Laser Institute of America
Laser Applications and Safety

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E-mail: conferences@laserinstitute.org

PICALO Advance Program 2010
www.laserinstitute.org/picalo

Important Planning Information

While planning for your trip to Wuhan to attend PICALO 2010, please note that LASER WORLD of Photonics China and the 5th Laser Processing & Components Conference will be held a week prior in Shanghai, March 16-18, 2010 at Shanghai's New International Expo Centre.

To find out more about the LIA supported Laser Processing & Components Conference visit *http://world-of-photonics.net/link/en/19772231*.

To find out more about LASER WORLD of Photonics China visit *www.world-of-photonics.net/en/laser-china/start*.

LASER World of PHOTONICS CHINA

Sincere Thanks to our PICALO 2010 Sponsors:

Advanced Optowave Corporation
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Northrop Grumman

Who Should Attend PICALO?

Anyone interested in lasers and materials processing from the basic understanding of the interaction between a laser beam and a material to those interested in how a process can be integrated and optimized for an application should attend PICALO. The organizing committee's goal for PICALO is to bring both academic and industry people together who may benefit from laser technology. This includes researchers and end-users as well as engineers and technicians engaged in developing laser technology. The conference will provide a face-to-face platform for scholars, experts and entrepreneurs worldwide as well as management personnel, technicians, and end-users in China, especially in Wuhan. At the same time, PICALO will demonstrate the development and achievements in the field of laser processing in recent years and thus bridge China's companies and enterprise to the world.