3rd Pacific International Conference on Applications of Lasers and Optics

PICALO

April 16-18, 2008 • Capital Hotel • Beijing, China

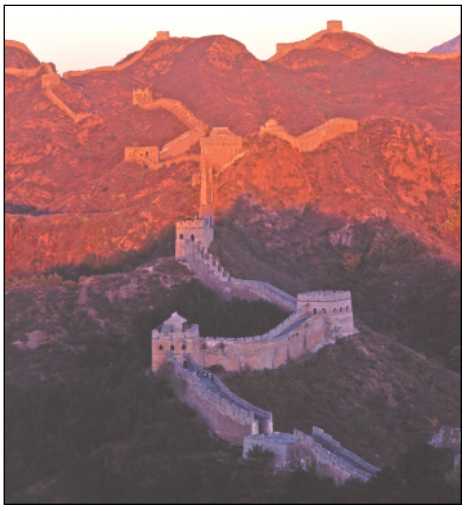
Advance Program

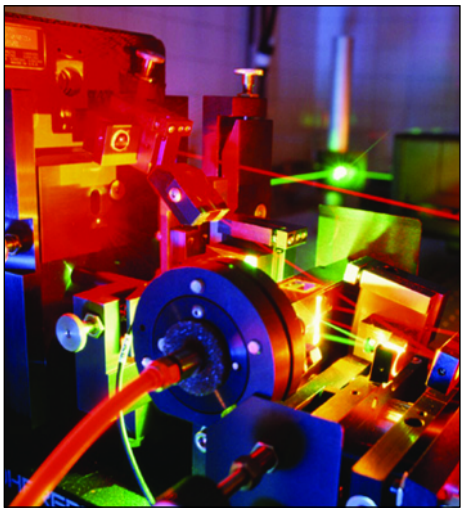
PICALO General Conference Chair: Minlin Zhong, Tsinghua University, Beijing, People's Republic of China

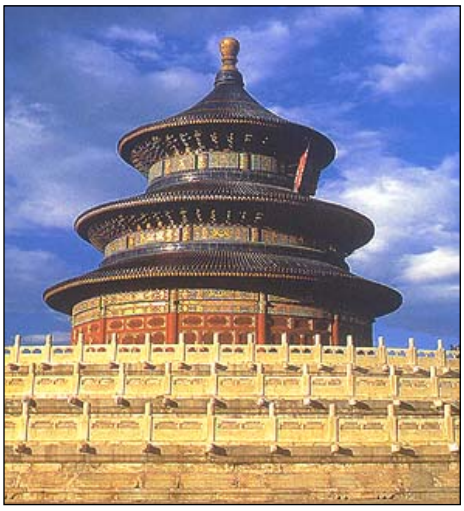
PICALO Laser Materials Processing Conference Chairs:
Lin Li, The University of Manchester, Manchester, UK
Hau-Chung Man, The Hong Kong Polytechnic University, Hung Hom, Kowloon, Hong Kong

PICALO Micro, Nano & Ultrafast Fabrication Conference Chairs:
Yongfeng Lu, University of Nebraska-Lincoln, Lincoln, NE, USA
Xiaoyan Zeng, Huazhong University of Science & Technology, Wuhan, People's Republic of China

PICALO International Enterprise Summit - NEW FOR 2008!
Globalization: Opportunities & Challenges for Laser Companies in China & the World
Bo Gu, GSI Group, Inc., Wilmington, MA, USA
Rangda Wu, Chutianlaser, Wuhan, People's Republic of China







Featuring

Laser Materials Processing Conference

Micro, Nano & Ultrafast Fabrication Conference

PICALO International Enterprise Summit - NEW FOR 2008!
Globalization: Opportunities & Challenges for Laser Companies in China & the World

Presented by Laser Institute of America in cooperation with
Laser Processing Committee of China Optical Society (LPC-COS) and Tsinghua University

Laser Institute of America
Laser Applications and Safety
40th Anniversary

China Optical Society
Laser Processing Committee

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

PICALO 2008 Conference Agenda

Sunday, April 13 – Monday, April 14

Pre-Conference Wuhan Tour

Wednesday, April 16

8:00am Registration Desk Open

9:00am Plenary Session

12:00pm Lunch in Local Restaurant

1:30pm LMP #1: Laser Cutting & Machining
LMP #2: Surface Modification
LMP #3: Laser Welding & Joining I
Micro #1: Fundamental Science in Laser-Material Interactions

2:50pm Afternoon Break

3:10pm Micro #2: Near-Field Phenomena for Nanoprocessing

5:00pm Welcome Reception

Thursday, April 17

8:00am Registration Desk Open

9:00am LMP #4: Industrial Applications I
Micro #3: Laser Microfabrication in Industry
Micro #4: Laser Assisted Device Fabrication
Laser Materials Processing Poster Presentation Gallery

10:20am Morning Break

10:40am Micro #5: Laser Microwelding
Micro #6: Laser Direct Writing

12:00pm Lunch in Local Restaurant

1:30pm LMP #5: Additive Manufacturing
LMP #6: Laser Welding & Joining II
Micro #7: Ultrafast Processes in Materials Processing
International Enterprise Summit

2:50pm Afternoon Break

3:10pm Micro #8: Laser Microprocessing for Photonic Devices

5:30pm Vendor TableTop Display & Reception

Friday, April 18

8:00am Registration Desk Open

9:00am LMP #7: Hybrid Welding & Joining
LMP #8: Modeling & Simulation
LMP #9: Lasers & Systems
Micro #9: Lasers in Bio-engineering
Micro, Nano & Ultrafast Fabrication Poster Presentation Gallery

10:20am Morning Break

10:40am Micro #10: Laser Micromachining

12:00pm Lunch in Local Restaurant

1:30pm LMP #10: Industrial Applications II
LMP #11: Laser Drilling, Forming, & Peening
LMP #12: Laser Surface Modification
Micro #11: Laser Synthesis & Sintering of Nanoparticles

2:50pm Afternoon Break

3:10pm Micro #12: Advanced Laser Applications

6:00pm Closing Banquet

Saturday, April 19

Post Conference Tour – Great Wall of China

*Program subject to minor changes

Special Thanks to the PICALO 2008 Cooperating Societies

Association of Laser Users

Beijing Optical Society

Chinese Journal of Lasers

Chinese Society of Non-Traditional Machining

Chinese Welding Society

European Laser Institute

European Optical Society

Japan Laser Processing Society

PICALO 2008 Conference Chair Welcome

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

Welcome to PICALO 2008 and Beijing -"The Olympics" for international laser materials processing. PICALO 2008 is the third conference focusing on the growth of industrial lasers and applications in the pacific region. The general aim of PICALO is to bring together researchers, engineers, equipment suppliers and industry personnel to hear the latest developments and progress in lasers and applications and to share knowledge, experiences and visions. PICALO 2008 will feature an exciting laser macro/micro processing program, a unique international enterprise summit and a charming post-conference excursion in Beijing. You will feel the rapid development of the country, the fantastic Chinese culture and long history, the dynamic and modern metropolitan activities and also the Olympic atmosphere -one world, one dream!

The organizing committee will ensure that you get the maximum benefit from the technical program while having a great time during the conference. I would encourage you to take this opportunity to spend time here and enjoy this great country, her great culture, the Great Wall and the delicious Chinese food. PICALO 2008 is presented by Laser Institute of America in cooperation with the Laser Processing Committee of China Optical Society (LPCCOS) and Tsinghua University. LIA will handle all abstract submissions and conference registrations. On behalf of the organizing committee and conference chairs, I would like to formally invite you to attend PICALO in April 2008 in Beijing and be a part of this great event!

Minlin Zhong

Plenary Session

Extreme Photonic/Laser Processing: Ultra Intense, Ultra-fast & Nano-scale

PICALO 2008 can be called the Olympics for Laser Materials Processing as it will be held in Beijing, the 2008 Olympic host city. "To be higher, stronger and faster" challenges humans to their utmost. Likewise, laser applications have been continuously pushed forward to almost every aspect of science and engineering and to almost every extent of possibility. The PICALO 2008 plenary session highlights "extreme photonic/laser processing," characterizing extreme high power intensity, extreme short pulse duration and extreme new material and phenomena. This plenary session starts with an impressive report on 150-terawatt power laser-mater relativistic interaction, generation of bright pulses of energetic (keV – MeV) x-rays and charged-particle beams, and unique applications in the physical sciences, biomedicine, defense and homeland security. Follows is an intriguing presentation on Photonic Meta Materials, Nano-scale plasmonics and Super Lens, which may inspire profound impact in wide range of applications such as nano-scale imaging, nanolithography, and integrated nano photonics. The session continues with an interesting report on state-of-the-art high power high brightness laser materials processing with characteristic traits on smaller, cost-effective and processing on-the-fly. The session also highlights a research and development work on a made-in-China 8 kW diode pumped solid state laser and its applications.

Invited Plenary Speakers

Ultra-intense Laser-matter Interactions with a 150-terawatt Power Laser
Donald Umstadter, University of Nebraska-Lincoln

Photonic Meta Materials, Nano-scale Plasmonics and Super Lens
Zhang Xiang, UC Berkeley

High Power Laser Materials Processing - New Developments and Trends
Eckhard Beyer, Frauhofer IWS

Research and Development on High Power DPSSL in China
Jinmin Li, Institute of Semiconductor, Chinese Academy of Sciences

About Laser Institute of America

Laser Institute of America (LIA) is the international society for laser applications and safety. LIA's mission is to foster lasers, laser applications, and laser safety worldwide. Serving the industrial, medical, research and government communities, LIA offers technical information and networking opportunities to laser users from around the globe.

LIA presents several conferences that are recognized by the global community to be the best forums for exchanging up-to-date technical information on laser technology, applications, and safety. Attracting the best minds from the hottest fields, these forums bring together laser professionals from North America, Europe, Asia, and the Pacific Rim.

LIA also offers a wide array of products and services to thousands of end users. These include safety and applications publications, training videos, signs and labels, Laser Safety Officer training, and more. For more information, visit LIA at www.laserinstitute.org.

PICALO Tours

PICALO Pre-Conference Laser Industry Tour
Wuhan, China

Sunday, April 13 - Monday, April 14
PICALO attendees have the opportunity to visit historic Wuhan and tour prominent laser companies.
Cost: $150USD per participant
Additional to PICALO registration fee; air travel arrangements on own.

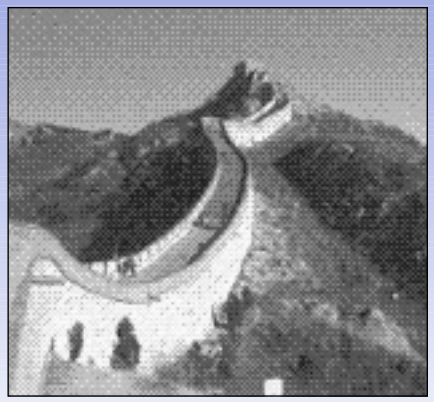
Wuhan, capital of the Hubei province, is known as China's Optical Valley. It is the largest base for the optical electronics and photoelectronics industries in China. The Optical Valley is located in the Wuhan East Lake High-Tech development zone. Wuhan's optical electronics industry encompasses optical communication, power and consumer optical electronics, and relevant software. The industry is on an upswing, with the production value growing by an average of 30 percent a year since 2001. Its fiber-optic cable sector is currently third in the world in terms of manufacturing capability.

Participants who arrive Sunday evening will enjoy dinner and a Yangtze River Evening Cruise. The tour on Monday will feature three companies (National Optical-electronic Laboratory, Huazhong Univ. of Science and Technology, Chutian Laser Processing Company and Huagong Laser Engineering Company), and attendees will interact with executives from each company. Enjoy a driving tour of Wuhan and see the history including including Huanghe Pagoda and East Lake. Conclude the day with a closing dinner banquet including representatives from the featured companies and other area Wuhan laser companies. Don't miss this exciting networking opportunity in Wuhan, China!

See complete itinerary at www.laserinstitute.org/conferences/picalo.

PICALO Post Conference Tour: MutianYu Section of the Great Wall of China, Ming Tombs, & the Famous Cloisonné Factory

Saturday, April 19
Cost: $110USD per participant (additional to PICALO registration fee)
Includes roundtrip transportation from the Capital Hotel, lunch, all admission fees and gratuities.



The Great Wall

An hour's drive from Beijing's center is an amazing work of architectural innovation, the Great Wall of China. The Great Wall, the only man made wonder of the ancient world which can be seen from the moon, is a magnificent monument to China's long and rich history.

The PICALO tour will visit a lesser know section of the Wall - MutianYu. Located at Huairou County some 73 kilometers (about 45 miles) northeast of the Beijing urban area, MutianYu Great Wall winds along lofty, cragged mountains from the southeast to the northwest for approximately 2.25 kilometers (about 1.4 miles). Connected with Juyongguan Pass to the west and Gubeikou to the east, this section of the Great Wall holds a prominent place in Chinese military history. Take time to walk up the snaking sections of walls, peek through the watchtowers and enjoy the amazing view.

Participants will have plenty of time to marvel at the sites (approximately 3 hours). Depart the Great Wall and head to lunch at a Chinese style restaurant (included in tour fee).

Depart after Lunch for the Ming Tombs via the "Sacred Way."

Entrance to Ming Tombs at the Sacred Way

The Ming dynasty was known as the "period of restoration and reorganization" in the 18th century as China, under the Ming era, saw a flourish of the trading business with the rest of the world. With that prosperity, the wealth was splurged on both the living and the dead.

Take a tour of the vast mausoleums of 13 emperors of the Ming Dynasty at the Ming Tombs which lie northwest of Beijing. After taking in the Great Wall (which the Ming emperors were heavily involved in), venture around the magnificent Changling tomb which inhumes Emperor Zhuli and his empresses, some of which were said to be buried alive.

Cloisonné Factory Visit

End the day with a visit to a cloisonné factory. Cloisonné is a unique combination of copper and porcelain working skills, traditional painting, sculpting, and etching skills. Originating in Beijing during the Yuan Dynasty (1271-1368), Cloisonné is an intricate process that requires many years of training for an artisan to master. Cloisonné pieces can be found in large objects, such as vases and other large utensils and decorative items, as well as small items like earrings, bracelets, chopsticks, or jars.

Laser Materials Processing Conference

Lin Li
The University of Manchester
Manchester, UK

Hau-Chung Man
The Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong

The PICALO Laser Materials Processing Conference features the latest developments across the world in laser cutting / machining (metals, ceramics and glass, thick section), surface modification (marking, texturing, cladding, sintering, cold spray, melt injection, induction assisted cladding, laser-sol coating, combined cladding/shot peening), welding (alloys, plastics, fibre laser welding, welding dissimilar materials, hybrid welding), additive manufacturing (selective laser melting, direct laser deposition), lasers and systems (fibre laser, diode laser, CO2 laser, process sensing and control), modelling and simulation (fluid dynamics, temperature fields, FE and analytical modelling), drilling and forming, and industrial applications (aerospace, automotive, petroleum, energy, bio-medical and process industries). The presentations are given in 10 oral sessions with over 80 papers and a poster session. Invited speakers from leading research groups and companies worldwide are presenting their recent findings and future prospects.

A special characteristic of the conference is the large number of participants from Asia, especially from China, providing an opportunity for the laser manufacturers, equipment suppliers as well as various industries and academics for the exploration of commercial and academic collaborations and businesses.

Program Committee:

Pascal Aubry, CEA / GERAILP, Arcueil, France
Woong-Seong Chang, RIST, Pohang, South Korea
Yanbin Chen, Harbin Institute of Technology, Harbin, People's Republic of China
Paul Hilton, TWI Ltd., Great Abington, Cambridge, UK
Weidong Huang, Northwestern Polytechnic Univ., Xian, People's Republic of China
Takashi Ishide, Mitsubishi Heavy Industries, Ltd., Takasago, Hyogo, Japan
Stefan Kaierle, Fraunhofer ILT, Aachen, Germany
Seiji Katayama, Osaka Univ., Ibaraki, Osaka, Japan
David Low, SIMTech, Singapore
Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China
G. Sundararajan, International Advanced Research Centre for Powder Metallurgy and New Materials, Andhra Pradesh, India
Kenneth Watkins, The Univ. of Liverpool, Liverpool, UK
Lijue Xue, National Research Council Canada, London, ON, Canada
Y. Lawrence Yao, Columbia Univ., New York, NY, USA
Qingmao Zhang, South China Normal Univ., Guangzhou, People's Republic of China
Yongkang Zhang, Jiangsu Univ., Zhenjiang, People's Republic of China
Norman Zhou, Univ. of Waterloo, Waterloo, ON, Canada
Xiao Zhu, HUST, Wuhan, People's Republic of China

LMP Session 1: Laser Cutting & Machining
Wednesday, April 16 • 1:30pm

Session Chair: Duncan Hand, Heriot-Watt Univ., Edinburgh, UK

Current Challenges to Laser Cutting Application (Invited Paper)...(101)
Takeji Arai, The Japan Society of Laser Technology

Applications of a Novel Supersonic Laser Cutting Head (Invited Paper) . . . . . (102)
Juan Pou, Antonio Riveiro, Félix Quintero, Fernando Lusquinos, Rafael Comesaña, Univ. de Vigo

Reactive Thick Section Cutting with Fibre and Disk Laser. . . . . (103)
William O'Neill, Tao Zhang, Univ. of Cambridge

Study on the Machining Process of a New Laser Crack-free Cutting Technique for Ceramics. . . . . (104)
Lingfei Ji, Yong Bao, Yinzhou Yan, Yijian Jiang, Institute of Laser Engineering, Beijing Univ. of Technology

Laser Machining in Ceramics Manufacture (Invited Paper) . . . . . (105)
Duncan Hand, Heriot-Watt Univ.

High Precision Machining and Cutting of Si Using a Single Mode (Invited Paper) . . . . . (106)
William O'Neill, K. Li, Univ. of Cambridge

Effect of Laser Beam on Machining of Titanium Alloys . . . . . (107)
Shoujin Sun, James Harris, Yvonne Durandet, Milan Brandt, Swinburne Univ. of Technology

A Novel Technology of the Laser Cleaving on Glass Sheets with Multiple Laser Beams. . . . . (108)
Yen-Liang Kuo, Jehnming Lin, National Cheng Kung Univ.; Tien-Ching Chen, Geniray Technology Corporation

The Development of Laser-Chemical Combined Large Scale Etching on Difficult-to-Cut Materials . . . . . (109)
Yuan Genfu, Anhui Institute of Architecture and Industry

LMP Session 2: Surface Modification
Wednesday, April 16 • 1:30pm

Session Co-chairs: Hau-Chung Man, The Hong Kong Polytechnic Univ., Hung Hom, Kowloon, Hong Kong; Minlin Zhong, Tsinghua Univ., Beijing, People's Republic of China

A New Method of Laser Beam Induced Surface Modification using the Surfi-Sculpt® Process (Invited Paper) . . . . . (201)
Paul Hilton, TWI Ltd.

Colour Marking of Metals with Fibre Lasers . . . . . (202)
Tony Hoult, Lu Ming, SPI Lasers; Anthony Tse, A & P Instrument Co. Ltd

Laser Producing Ni-Matrix Composite Reinforced by In-Situ Synthesized Particles. . . . . (203)
Mingxing Ma, Ruiquan Kang, Wenjin Liu, Minlin Zhong, Tsinghua Univ.

Microstructure and Property of Ni-P-Nano Al2O3 Electroless Plating Layer Produced on Medium Carbon Steel Treated by Laser Technology . . . . . (204)
Fanzhi Kong, Aihuan Dun, Jianhua Yao, Zhejiang Univ. of Technology

Surface Modification of Dental Hard Tissues using Pulsed UV Lasers (Invited Paper) . . . . . (205)
Victor Oliveira, Rui Vilar, Instituto Superior Técnico

Numerical and Experimental Investigation of Thermal Stresses and Distortions in the Induction Assisted Laser Cladding. . . . . (206)
Frank Brückner, Dietrich Lepski, Fraunhofer IWS; Eckhard Beyer, Fraunhofer IWS, Dresden Univ. of Technology

Synthesis and Coating of AlN on Mild Steel by Combined Laser Sol-Gel Technique . . . . . (207)
Philip Crouse, Lin Li, Paul Mativenga, Marimuthu Sundar, The Univ. of Manchester

A Novel Approach of Surface Modification by Means of Laser Cladding Combined with Laser Shot Peening . . . . . (208)
Suqin Jiang, Jiangsu Univ.

Direct Diode Lasers for Surface Modification . . . . . (209)
John Haake, Coherent Inc.

LMP Session 3: Laser Welding & Joining I
Wednesday, April 16 • 1:30pm

Session Co-chairs: Yanbin Chen, Harbin Institute of Technology, Harbin, People's Republic of China; Paul Hilton, TWI Ltd., Cambridge, UK

State of the Art of Laser Welding of Aluminum Alloys in China (Invited Paper) . . . . . (301)
Ronghsi Xiao, Institute of Laser Engineering, Beijing Univ. of Technology

Laser Welding of NiTi Shape Memory Alloy . . . . . (302)
Wang Wei, Aviation Univ. of Air Force; Chang Chun, Beijing Aeronautical Manufacturing Technology Research Institute

Welding Performance of a 2KW Continuous Wave Supermodulated Nd:YAG Laser-increased Weld Speed, Weld Penetration and Reduced Porosity with Supermodulated Output Power. . . . . (303)
Mohammed Naeem, GSI Group, Inc. - Laser Division

LMP Session 4: Industrial Applications I
Thursday, April 17 • 9:00am

Session Co-chairs: Jack Gabzdyl, SPI Lasers, Southampton, UK; Lin Li, The Univ. of Manchester, Manchester, UK

LMP Session 5: Additive Manufacturing
Thursday, April 17 • 1:30pm

Session Co-chairs: Milan Brandt, Swinburne Univ. of Technology, Melbourne, Australia; Lijue Xue, National Research Council of Canada, London, ON, Canada

LMP Session 6: Laser Welding & Joining II
Thursday, April 17 • 1:30pm

Session Co-chairs: Dirk Petring, Fraunhofer ILT, Aachen, Germany; Andrew Pinkerton, The Univ. of Manchester, Manchester, UK

LMP Session 7: Hybrid Welding & Joining
Friday, April 18 • 9:00am

Session Co-chairs: Session Co-chairs: Steve Shi, TWI Ltd, Cambridge, UK; Norman Zhou, Univ. of Waterloo, Waterloo, ON, Canada

Joining of Magnesium using Laser Assisted Self-pierce Riveting Technology . . . . . (704)
Yvonne Durandet, Wei Song, Brian Dempster, Milan Brandt, CCRC, Swinburne Univ. of Technology; Stuart Blacket, Henrob (UK) Pty Ltd

Enhancement of Laser Welding Capabilities by Hybridization or Combination of Different Processes. . . . . (705)
Dirk Petring, Fraunhofer ILT

A Comparison of the Pitting Corrosion Behavior of 304L Stainless Steel by TIG, Laser and Laser-TIG Hybrid Welding . . . . . (706)
Jun Yan, Ming Gao, Qianwu Hu, Xiaoyan Zeng, Huazhong Univ. of Science and Technology

Guidance and Stabilization of Electric Arc Welding using Nd:YAG Laser Radiation . . . . . (707)
Jörg Hermsdorf, Rainer Kling, Christian Stahlhut, Frank Ziems, Laser Zentrum Hannover e.V.

Study on Welding Characteristics of Combining Laser Welding and Resistance Seam Welding Joined Ti6Al4V Alloy Lap Joints. . . . . (708)
Xinge Zhang, Liqun Li, Zhenglong Lei, Yanbin Chen, Harbin Institute of Technology

LMP Session 8: Modeling & Simulation
Friday, April 18 • 9:00am

Session Co-chairs: Rémy Fabbro, LALP (CNRS)/GIP GERAILP, Arcueil Cedex, France; Weidong Huang, Northwestern Polytechnic Univ., Xian, People's Republic of China

Research on Fluid Dynamics during Laser Deep Penetration Welding. . . . . (801)
Wang Hong, BAMTRI

Therotical and Experimental Research on Temperature Field of Coaxial Powder Flow in Laser Cladding . . . . . (802)
Yang Xichen, Laser Processing Center, Tianjin Polytechnic Univ.

Integrated Model of Turbulent Fluid Flow, Heat Transfer and Mass Transfer in Laser Cladding Process for Direct Metal Deposition. . (803)
Yanlu Huang, Yongqiang Yang, Guoqiang Wei, South China Univ. of Technology

Modeling Utility for Percussion Laser Drilling - Experiment vs Theory. . . . . (804)
Tom Eppes, Univ. of Hartford

Heat Transfer and Fluid Flow during Double-track Laser Cladding of H13 Tool Steel (Invited Paper) . . . . . (805)
Xiuli He, Jyoti Mazumder, CLAIM, The Univ. of Michigan

Three-dimensional Analytical and Finite Element Methods for Simulating a Moving Melt Pool with Mass Addition . . . . . (806)
Andrew Pinkerton, Alhaji Kamara, Kamran Shah, Lin Li, The Univ. of Manchester

3D Finite Element Simulation for the Temperature Field of Direct Metal Laser Sintering Process. . . . . (807)
Xia Ji, Jiangsu Univ.

The Absorptance of Metal Surfaces to Nd:YAG/Nd:YLF Laser Light. . (808)
D. Bergstrom, Mid Sweden Univ.; John Powell, Alexander Kaplan, Luleå Univ. of Technology

LMP Session 9: Lasers & Systems
Friday, April 18 • 9:00am

Session Co-chairs: Stefan Kaierle, Fraunhofer ILT, Aachen, Germany; Bill Shiner, IPG Photonics Corp., Oxford, MA, USA

Advances of Fiber Lasers and their Applications (Invited Paper) . . . . (901)
Bill Shiner, IPG Photonics Corp.

The Design Method of High-efficiency Coupling of Fiber for the High-power Solid Laser . . . . . (902)
Baohua Wang, Menghua Jiang, Yongling Hui, Qiang Li, Kai Pang, Institute of Laser Engineering of Beijing Univ. of Technology

Reliable High-power Laser Diode Arrays. . . . . (903)
Brad Debok, Ryan Feeler, Northrop Grumman Cutting Edge Optronics

New Developments in CO2 Laser Technology Enable New Applications . . . . . (904)
Frank Gaebler, Coherent Inc.

Does High Beam Quality of Solid State Lasers Enhance Laser Material Processing? (Invited Paper) . . . . . (905)
Mohammed Naeem, John Chinn, Bo Gu, GSI Group Inc.

Process Control on Laser Cladding by Coaxial Vision for Direct Manufacturing of 3D Metallic Structures . . . . . (906)
Pascal Aubry, Mehdi Guiraud, GIP GERAILP

Advances in Laser-deposition Equipment and Capabilities . . . . . (907)
Richard Grylls, Optomec

Process Control in Laser Materials Processing - Combined Sensor Technologies for Secure Quality Assurance . . . . . (908)
Markus Kogel-Hollacher, Precitec Optronik GmbH

LMP Session 10: Industrial Applications II
Friday, April 18 • 1:30pm

Session Co-chairs: Anthony Hoult, SPI Lasers, Santa Clara, CA, USA; Henry Peng, GE (China) Research & Development Center Co. Ltd., Shanghai, People's Republic of China

Comparative Study of Techniques for Wear Minimisation of Engine Parts . . . . . (1001)
Martin Dahmen, Stefan Kaierle, Fraunhofer ILT; Wenjin Liu, Dept. of Mechanical Engineering, Qinghua Univ.; Hequiang Wen, Beijing Locomotive Works; Aiping Wu, Beijing Insitute of Opto-Electronic Technology

Reconditioning of Workpieces and Turbine Parts by Laser Metal Deposition of High Temperature Steels and Alloys . . . . . (1002)
Ernst Wolfgang Kreutz, Stefanie Keutgen, Ingomar Kelbassa, Bernd Burbaum, Lehrstuhl für Lasertechnik; Leping Zhu, Rolls-Royce Deutschland

The Application Research on Laser Welding Cab-roof of Truck...(1003)
Yuan Yao, China FAW Group Corp. R & D Center

Integrated Heat Treatment - Comparison of Different Machine Concepts . . . . . (1004)
Steffen Bonss, Jan Hannweber, Udo Karsunke, Marko Seifert, Eckhard Beyer, Berndt Brenner, Fraunhofer IWS

Laser Material Processing in the Aero Engine Industry. Established, Cutting-Edge and Emerging Applications. . . . . (1005)
Karl-Hermann Richter, MTU Aero Engines

Model-making of Building & Sculpture Based on Laser Rapid Prototyping Technology . . . . . (1008)
Chen Xuehui, Center of Laser Advanced Manufacturing Technology, Anhui Institute of Architecture and Industry

Nopaltzin Li: The New Laser Machine for Cactus Cleaning with Optical Detection of Spines . . . . . (1009)
Luis Ponce, CICATA-IPN

LMP Session 11: Laser Drilling, Forming, & Peening
Friday, April 18 • 1:30pm

Session Co-chairs: Mohammed Naeem, GSI Group, Inc. - Laser Division, Rugby, UK; John Powell, Luleå Univ. of Technology, Luleå, Sweden

A Novel Hole Geometry Measurement Technique using a Laser Micro-beam . . . . . (1101)
Tom Eppes, Univ. of Hartford

A Statistical Model for Research on the Focal Position Effect on the Taper of Laser Drilling. . . . . (1102)
Yinzhou Yan, Lingfei Ji, Yong Bao, Yijian Jiang, Institute of Laser Engineering, Beijing Univ. of Technology

Laser Drilling in Superalloy with 150~550Ns Pulses Train. . . . . (1103)
Zhang Xiaobing, BAMTRI

Topographic Analysis of Holes Drilled by Pulsed Nd:YAG Laser on DD6 Single-crystal Superalloy . . . . . (1104)
Chen Changjun, Zhang Min, Zhang Shichang, Chang Qingming, Yan Wenqing, Key Laboratory for Ferrous Metallurgy and Resources Utilization of Ministry of Education, Laser Processing Research Center; Zhang Xiaobing, Key Laboratory for High Energy Density Beam Processing Technology

Analysis of the Formability of Aluminum Alloy Sheet based on Laser Shock Forming . . . . . (1105)
Yinfang Jiang, Yongkang Zhang, Zhiwei Du, Runa Li, Chaoyang Shi, Jiangsu Univ.; Yuanyou Zhu, Nanjing Institute of Technology

Process Parameters Study of Closed-loop Laser Rapid Forming . . . . (1106)
Jun Yu, Jing Chen, Hua Tan, Xin Lin, Weidong Huang, State Key Laboratory of Solidification Processing, Northwestern Polytechnical Univ.

The Study on the Laser Compound Forming of Sheet Metal . . . . (1107)
YiBin Chen, Jianzhong Zhou, Jiangsu Univ.

The Fatigue Properties of Laser Shock Processed Aluminum Alloy 7050. . . . . (1108)
Zou Shikun, BAMTRI

Dynamical Simulation and Experimental Study on the Process of Laser Peen Forming of Metal Plate. . . . . (1109)
Shu Huang, Jianzhong Zhou, Jiangsu Univ.

LMP Session 12: Laser Surface Modification
Friday, April 18 • 1:30pm

Session Co-chairs: Yijian Jiang, Instituite of Laser Engineering, Beijing Univ. of Technology, Beijing, People's Republic of China; Rui Vilar, Instituto Superior Técnico, Lisboa Codex, Portugal

Improving Physical Properties of Functional Materials by Laser Irradiation (Invited Paper) . . . . . (1201)
Yijian Jiang, Instituite of Laser Engineering, Beijing Univ. of Technology

Recent Developments of the Laser-assisted Cold Spray Process and Deposit Characterisation . . . . . (1203)
Matthew Bray, Andrew Cockburn, William O'Neill, Univ. of Cambridge

Mechanism Analysis on Dry-friction Abrasive Wear Resistance of Particulate Reinforced MMC Coatings by Laser Deposition for Corrugate Rollers. . . . . (1204)
Zhaoyong Qian, Minlin Zhong, Wenjin Liu, Tsinghua Univ.

Metal Matrix Nano H-BN Self-lubricating Composite Coating Synthesized by Nd:YAG Laser Cladding. . . . . (1205)
A.H. Wang, Huazhong Univ. of Science and Technology

Study on the Deposition of Nickel Base Waspaloy Powder via High Power Fiber Laser . . . . . (1206)
Guijun Bi, Xuefeng Zhang, Ian Pashby, School of Mechanical, Materials and Manufacturing Engineering, Univ. of Nottingham; Jeff Allen, Rolls Royce PLC

Laser Melt Injection of Monocrystalline WC Particles into Ti-6Al-4V . . . . . (1207)
Dejian Liu, Fuquan Li, Yanbin Chen, Liqun Li, Harbin Institute of Technology

Residual Stress Distribution in Laser Alloying Zone with Fecsib Powder . . . . . (1208)
Zhengyang Li, Haiyan Zhao, Bin Zhang, Yu Gu, Minlin Zhong, Wenjin Liu, Dept. of Mechanical Engineering, Tsinghua Univ.; Qiulin Wu, Beijing Beiye Functional Materials Co.Ltd.

Corrosion Properties of Laser Surface-treated Nickel Titanium . . . . . (1209)
Ng Ka Wai, The Hong Kong Polytechnic Univ.

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Laser Industry Vendor Program Reception & TableTop Display

Thursday, April 17 • 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 Beth Cohen at 407.380.1553 or e-mail: bcohen@laserinstitute.org. Alphabetical order; Registered as of December 15.

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Micro, Nano & Ultrafast Fabrication Conference

Yongfeng Lu, Univ. of Nebraska-Lincoln Lincoln, NE, USA

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

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, 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 2008 is a global forum for engineers and scientists from a variety of industry segments and 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 pico- and femtosecond time regime. Special sessions are dedicated to fundamental science in laser-material interactions, near-field phenomena for nanoprocessing, laser microfabrication and micromachining, laser microwelding, laser-assisted device fabrication, laser direct writing, ultrafast processes in materials processing, laser synthesis and sintering of nanoparticles, and lasers application in bio-engineering. 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.

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Kunihiko Washio, Paradigm Laser Research Ltd., Machida, Tokyo, Japan
Xianfan Xu, Purdue Univ., West Lafayette, IN, USA

Micro Session 1: Fundamental Science in Laser-Material Interactions
Wednesday, April 16 • 1:30pm

Session Chair: Xianyan Zeng, Huazhong Univ. of Science & Technology, Wuhan, People's Republic of China

Fundamental Issues Concerning Material Removal by Laser Irradiation from Insulating Materials (Invited Paper) . . . . . **(M101)**
Tom Dickinson, Washington State Univ.

Processing of Polymer and Organic Materials using Tunable Ultrafast Mid-infrared Lasers (Invited Paper) . . . . . **(M102)**
Richard Haglund, Vanderbilt Univ.

Laser Micro-fabrication of Custom Micro-optics for Beam Brightness Enhancement of High Power Diode Lasers (Invited Paper) . . . . **(M104)**
D.R. Hall, H.J. Baker, R. McBride, E. Mendez, School of Engineering and Physical Sciences, Heriot-Watt Univ.

Micro Session 2: Near-Field Phenomena for Nanoprocessing
Wednesday, April 16 • 3:10pm

Session Chair: Yongfeng Lu, Univ. of Nebraska - Lincoln, Lincoln, NE, USA

Nanoscale Laser Processing and Diagnostics (Invited Paper) . . . **(M201)**
Costas Grigoropoulos, Univ. of California

High Transmission Nanoscale Ridge Apertures and Its Application in Laser-based Nanomanufacturing (Invited Paper) . . . . . **(M203)**
Xianfan Xu, Purdue Univ.

Sub-wavelength Laser Direct Write Patterning (Invited Paper) . . . **(M204)**
Euan Mcleod, Craig B. Arnold, Princeton Univ.

Tuning the Near-field Focusing of Particle Lens for Surface Nano-fabrication . . . . . **(M205)**
Zengbo Wang, Laser Processing Research Centre; Wei Guo, David Whitehead, Lin Li, Laser Processing Research Centre, School of Mechanical, Aerospace and Civil Engineering; Lukyanchuk Boris, Data Storage Institute; Zhu Liu, Corrosion and Protection Centre, School of Materials

Micro Session 3: Laser Microfabrication in Industry
Thursday, April 17 • 9:00am

Session Chair: Hai-Lung Tsai, Univ. of Missouri-Rolla, Rolla, MO, USA

Progress in R&D on Ultrafast Laser Processing and Prospect of Industrial Applications (Invited Paper) . . . . . **(M301)**
Xinbing Liu, Panasonic Boston Lab.

Innovative Laser Technology for Semiconductor Manufacturing - Stealth Dicing (Invited Paper) . . . . . **(M302)**
Etsuji Ohmura, Osaka Univ.; Masayoshi Kumagai, Hideki Morita, Hamamatsu Photonics K.K.

High Quality Micro Machining with Tailored Short and Ultra Short Laser Pulses . . . . . **(M303)**
Arnold Gillner, Claudia Hartmann, Andreas Dohrn, Fraunhofer ILT

Single Step Micro Laser Cladding of Nanophased Powders . . . . **(M304)**
Henrik Mewes, Sonja Dudziak, Nils Weidlich, Oliver Meier, Laser Zentrum Hannover e.V.; Stefan Czerner, Microls

Micro Session 4: Laser Assisted Device Fabrication
Thursday, April 17 • 9:00am

Session Chair: Xinbing Liu, Panasonic Boston Laboratory, Cambridge, MA, USA

3D Microstructuring of Glass by Femtosecond Laser for Lab-on-a-Chip Applications (Invited Paper) . . . . . **(M401)**
Koji Sugioka, Yasutaka Hanada, Katsumi Midorikawa, RIKEN

Fabrication of Electrodes for the Application of Microbatteries (Invited Paper) . . . . . **(M402)**
Li Lu, National Univ. of Singapore

Nd:YAG Laser and Micropen Integrated Fabrication of Mim Thick Film Capacitors . . . . . **(M403)**
Yu Cao, Xiaoyan Zeng, HUST

Experimental Micromachining Results using a UV Laser with the Laser Microjet® . . . . . **(M404)**
John Stay, Synova SA

Micro Session 5: Laser Microwelding
Thursday, April 17 • 10:40am

Session Chair: Koji Sugioka, RIKEN, Saitama, Japan

Ultrafast Laser Microprocessing and Microwelding (Invited Paper) . . . . . **(M501)**
Kazuyoshi Itoh, Osaka Univ.; Takayuki Tamaki, Nara National College of Technology

Microwelding Performance Comparison Between a Low Power (125W) Pulsed Nd:YAG Laser and a Low Power (200W) Single Mode Fiber Laser . . . . . **(M502)**
Mohammed Naeem, GSI Group, Inc. - Laser Division

Development and Application of Miniaturized Scanners for Laser Beam Micro Welding . . . . . **(M503)**
Felix Schmitt, Fraunhofer ILT

Parameter Studies of Fibre Laser Micro-welding of SS316L using Taguchi Method . . . . . **(M504)**
Chi Wai Chan, H.C. Man, T.M. Yue, AMT Research Center, Dept. of ISE, The Hong Kong Poly Univ..

Micro Session 6: Laser Direct Writing
Thursday, April 17 • 10:40am

Session Chair: Kunihiko Washio, Paradigm Laser Research Ltd, Machida, Tokyo, Japan

Recent Progress of Femtosecond Laser Micro-nano Fabrication (Invited Paper) . . . . . **(M601)**
Wenhao Huang, USTC

Picosecond Lasers in Industrial Micromachining Applications (Invited Paper) . . . . . **(M602)**
Rainer Kling, Laser Zentrum Hannover e.V.

Laser Direct-write using Air-drying Conductive Paste (Invited Paper) . . . . . **(M603)**
Daniel Perkins, Texas Christian Univ.; Jason Stegall, David Willis, Southern Methodist Univ.

Direct Fabrication of Micro Temperature Sensor Arrays by Laser Micro-cladding Functional Materials on Ceramic Substrates . . . **(M604)**
Zhixiang Cai, Xiangyou Li, Xiaoyan Zeng, Wuhan National Lab. for Optoelectronics

Micro Session 7: Ultrafast Processes in Materials Processing
Thursday, April 17 • 1:30pm

Session Chair: Wenhao Huang, Univ. of Science and Technology of China, Hefei, People's Republic of China

Multiscale Modeling of Ultrafast Laser-material Interactions (Invited Paper) . . . . . **(M701)**
Lan Jiang, Beijing Institute of Technology; Hai-Lung Tsai, Univ. of Missouri-Rolla

Novel Aspects of Microprocessing by Ultrafast Lasers: From Electronic to Biological and Cultural Heritage Applications (Invited Paper) . . . . . **(M702)**
Costas Fotakis, FORTH CRETE

Femtosecond Fabrication of Nonlinear Photonic Crystals . . . . . **(M703)**
Min Gu, Swinburne Univ. of Technology

Direct Measurement of Temperature Distribution in Silicon by Ultrashort Laser Pulses . . . . . **(M704)**
Hong Yu Zheng, Singapore Institute of Manufacturing Technology

Micro Session 8: Laser Microprocessing for Photonic Devices
Thursday, April 17 • 3:10pm

Session Chair: Tatsuo Okada, Kyushu Univ., Motooka, Fukuoka, Japan

5-D Microscopy and 3-D Nanoprocessing for Femtosecond Laser Photonics Fabrication (Invited Paper) . . . . . **(M801)**
Peter Herman, Univ. of Toronto

Laser-induced Bandgap Engineering of Quantum Well Wafers: A Quest for Monolithically Integrated Photonic Devices (Invited Paper)...(M802)
Jan J. Dubowski, Univ. de Sherbrooke

Selective Area Bandgap Engineering of Algaas/Gaas Quantum Well Microstructures with a Laser Rapid Thermal Annealing Technique ...(M803)
Radoslaw Stanowski, Jan J. Dubowski, Univ. de Sherbrooke; H.H. Tan, C. Jagadish, The Australian National Univ.

Fabrication, Characterization and Simulation of Large-scale 3-D Photonic Crystals Using Laser-assisted Fabrication Techniques...(M804)
H. Wang, Yongfeng Lu, Univ. of Nebraska - Lincoln

Design and Experimental Realization of 3D Photonic Components Via Two-photon Polymerization . . . . . **(M805)**
Mark Boyle, Andre Neumeister, Johannes Zinn, Laser Zentrum Hannover e.V.; Andrei Lavrinenko, Technical Univ. of Denmark; Reinhld J. Leyrer, Wendel Wohlleben, Basf Aktiengesellschaft

Micro Session 9: Lasers in Bio-engineering
Friday, April 18 • 9:00am

Session Chair: Jan J. Dubowski, Univ. de Sherbrooke, Sherbrooke, QC, Canada

Optical-driven Nano Machines with Real-time Force Sensing and Biochemical IC Chip Family Fabricated by Two/Single Photon Micro Stereolithography (Invited Paper) . . . . . **(M901)**
Koji Ikuta, Nagoya Univ.

USP Laser Dissemination and Separation of Tissues (Invited Paper)...(M902)
Zhixiong Guo, Huan Huang, Xiaoliang Wang, Rutgers, The State Univ. of New Jersey

Laser Device for Elemental Determination in Human Skin. . . . . . **(M904)**
Luis Ponce, CICATA-IPN

Micro Session 10: Laser Micromachining
Friday, April 18 • 10:40am

Session Chair: Li Lu, National Univ. of Singapore, Singapore

Manufacturing of Shaped Holes in Multi-layer Plates by Laser-drilling . . . . . **(M1001)**
Kurt Walther, Mihael Brajdic, Jens Dietrich, Martin Hermans, Martin Witty, Alexander Horn, Ingomar Kelbassa, Reinhart Poprawe, Lehrstuhl für Lasertechnik, RWTH

Practical Issues in Laser Micro/Nano Machining . . . . . **(M1002)**
Wenwu Zhang, Jeffrey Shaw, Brian Farrell, GE Global Research

Laser-assisted-hot Embossing of Microstructures. . . . . . **(M1003)**
Jens Holtkamp, Fraunhofer ILT

Laser Assisted Micro and Nano Replication . . . . . **(M1004)**
Qin Hu, William O'Neill, Institute for Manufacturing, Dept. of Engineering, Univ. of Cambridge

Micro Session 11: Laser Synthesis & Sintering of Nanoparticles
Friday, April 18 • 1:30pm

Session Chair: Xianfan Xu, Purdue Univ., West Lafayette, IN, USA

Laser Fabrication of Nanoparticles and Crystals in Solution (Invited Paper). . . . . . **(M1101)**
Hiroshi Masuhara, Osaka Univ.

Fabrication of Nanomaterials by Laser Irradiation Process in Liquid Phase (Invited Paper) . . . . . **(M1102)**
Naoto Koshizaki, National Institute of Advanced Industrial Science and Technology

Flash Lamp Curing of Nano-particulates for Passive Device Fabrication (Invited Paper) . . . . . **(M1103)**
James Sears, South Dakota School of Mines & Technology

Fabrication of Micro-structured Components by Laser Micro-deposition . . . . . **(M1104)**
Huan Qi, Magdi Azer, GE Global Research

Micro Session 12: Advanced Laser Applications
Friday, April 18 • 3:10pm

Session Chair: Hongyu Zheng, SIMTech, Singapore

Aligned Growth of Zno Nanowires by Laser Ablation and Their Applications (Invited Paper) . . . . . **(M1201)**
Tatsuo Okada, Kyushu Univ.

Laser Micro Adjustment Technology - Possibilities and Challenges for Novel Applications (Invited Paper) . . . . . **(M1202)**
Michael Schmidt, Bayerisches Laserzentrum GmbH

Fabrication of Carbon Nanotube Interconnections by Current-assisted Laser Irradiation . . . . . **(M1203)**
Tao Gong, Yong Zhang, Wenjin Liu, Minlin Zhong, Tsinghua Univ.

Laser Treating of Carbon Nanotube Solar Cell. . . . . . **(M1204)**
Tao Gong, Yong Zhang, Wenjin Liu, Minlin Zhong, Tsinghua Univ.

Fabrication of Micro-machine Elements by Five-axis Laser Processing System . . . . . **(M1205)**
Souta Matsusaka, Takehiro Watanabe, Kensuke Iijima, Chiba Univ.

Laser Materials Processing Poster Presentation Gallery
Thursday, April 17

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Bingkun Xiang, Nanjing Univ. of Aeronautics and Astronautics

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Kai Chen, Rui Huang, Rongshi Xiao, Xudong Zhao, Song Zhang, Beijing Univ. of Technology

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Shan Ji-guo, Lei Xiang, Tan Wen-Da, Chen Wu-Zhu, Dept. of Mechanical Engineering, Tsinghua Univ.

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Shao Feng, Anhui Institute of Architecture & Industry

Investigation in Laser Colorful Marking in Stainless Steel by Pulsed Fiber Laser . . . . . (P109)
Ji-Min Chen, Hong-Liang Zhao, Sonoro Zhao, Institute of Laser Engineering, Beijing Univ. of Technology

Laser Sintering of (K0.5Na0.5Nbo3)-Litao3 Lead-free Ceramics with Novel Piezoelectric Properties . . . . . (P110)
Lingfei Ji, Xinyu Du, Yijian Jiang, Institute of Laser Engineering, Beijing Univ. of Technology

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Hong Chen, Institute of Laser Engineering, Beijing Univ. of Technology

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Huilai Sun, School of Mechanical and Electronic Engineering, Tianjin Polytechnic Univ.

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A.H. Wang, Huazhong Univ. of Science and Technology

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State of the Art Microfabrication with Excimer Lasers . . . . . **(P221)**
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General Information

Hotel Accommodations

Capital Hotel
3 Qian Men East Street
Beijing 100006, People's Republic of China
Hotel Reservations will need to be made directly through GTB Destination Management to receive the PICALO 2008 rate of $118 USD.
Hotel Reservations Deadline: February 20
Make your hotel reservations online at
www.gtborientholidays.com/PICALO/booking_form_working1.html

Conference Registration

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

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

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

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

Please Contact the LIA Conference Department at conferences@laserinstitute.org for 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 $105

February 2 – On-site $115
*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: + 407.380.1553, Fax: + 407.380.5588 or
E-mail: 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 for refunds 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. No refunds will be given for proceedings or tour package purchases.*

Average April Temperatures:

62°F / 17°C High
42°F / 7°C Low

Fees

Full Conference - Early Bird Registration
(payment received by February 1)
$595 USD Member
$595 USD Cooperating Society
$185 USD (1,400 CNY) Chinese Citizen
$160 USD (1,200 CNY) Chinese Citizen Student
$655 USD Non-member
$325 USD Student

February 2 – March 3
$645 Member
$645 Cooperating Society
$225 USD (1,700 CNY) Chinese Citizen
$200 USD (1,500 CNY) Chinese Citizen Student
$705 Non-member
$375 Student

March 4 - On-site
$695 Member
$695 Cooperating Society
$255 USD (1,900 CNY) Chinese Citizen
$225 USD (1,700 CNY) Chinese Citizen Student
$755 Non-member
$425 Student

One Day Conference Registration
Early Bird Registration
(payment received by February 1)
$220 USD each day
$110 USD (830 CNY) Chinese Citizen

February 2 – March 3
$250 USD each day
$130 USD (980 CNY) Chinese Citizen

March 4 - On-site
$285 USD each day
$150 USD (1,135 CNY) Chinese Citizen

On-site Registration Times

Wednesday, April 16	8:00am – 5:00pm
Thursday, April 17	8:00am – 4:00pm
Friday, April 18	8:00am – 12:00pm

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

PICALO International Enterprise Summit -
NEW FOR 2008!

Globalization: Opportunities & Challenges for Laser Companies in China & the World

Chairs: Bo Gu, GSI Group, Inc., Wilmington, MA, USA
Rangda Wu, Chutianlaser, Wuhan, People's Republic of China

East meets West

Executives from the Chinese Laser Industry and from leading world-class laser and optics companies come together to discuss the impact of globalization on the laser industry - opportunities and challenges for laser business in China and the world for the next decade and beyond.

This PICALO 2008 Summit will provide insight from industry experts, legal experts, and decision makers on how to do or expand business in China and on how the laser industry benefits from globalization. The forum allows face to face interaction- a great prospect for networking and relationship building. Don't miss this innovative East meets West event!

Invited Industry Executives

John Ambroseo, Coherent
Günther Braun, Rofin-Sinar Technologies Inc.
Sergio Edelstein, GSI Group
Valentin Gapontsev, IPG Photonics
Jianjuo Wu, Unity-Prima, China
Phillip Meredith, JDSU
Dayong Min, Huagong Laser, China
Robert Phillippy, Newport
Rangda Wu, Chutian Laser Group, China
Xun Zhou, Boye Laser, China

See PICALO Website for More Details
(www.laserinstitute.org/conferences/picalo)

PICALO Conference Registration Form

All prices are in United States Dollars (USD)
Chinese Citizen Registration Prices available on PICALO registration page.

Laser Institute of America, 13501 Ingenuity Dr., Suite 128, Orlando, FL 32826 USA

Phone: 407.380.1553 • Fax: 407.380.5588

or register online at www.laserinstitute.org/conferences/picalo

❑ **Please check here if you have any special needs and LIA will contact you.**

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

First Name/Initial/Last Name(surname):_____

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Telephone (Work):_____ Fax :_____

Telephone (Home):_____ E-mail:_____

Emergency Contact: Name _____ Phone:_____

Note: All above information must be provided in order to process registration

Special Dietary Needs: ❑ Vegetarian ❑ Other _____

A. Full Registration

Includes admission to the Plenary Session, Technical sessions, Lunch each day, Welcome Reception, Vendor Program Reception, Closing Banquet & Technical digest.

Check member status: Member of ❑ LIA ❑ AILU ❑ Beijing Optical Society ❑ Chinese Journal of Lasers ❑ Chinese Society of Non-Trad Machining
❑ Chinese Welding Society ❑ ELI ❑ European Optical Society ❑ JLPS Membership # _____

	LIA member / Cooperating Society	Non-member	Student*
Payment received by February 1	❑ $595USD	❑ $655USD	❑ $325USD
Payment postmarked or received February 2 – March 3	❑ $645USD	❑ $705USD	❑ $375USD
Payment postmarked or received March 4 – On-site	❑ $695USD	❑ $755USD	❑ $425USD

**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.*

B. One / Two Day Registration

Includes lunch and admission to events on that day only.

Date(s) *must* be checked to process registration: ❑ Wednesday, April 16 ❑ Thursday April 17 ❑ Friday, April 18

Payment Received by February 1	❑ $220USD One Day	❑ $440USD Two Day
Payment Postmarked or Received February 2 - March 3	❑ $250USD One Day	❑ $500USD Two Day
Payment Postmarked or Received March 4 - On-site	❑ $285USD One Day	❑ $570USD Two Day

C. Guests

Includes lunch each day, coffee breaks, welcome reception, vendor reception, & closing banquet.

❑ $130USD PP Name of guest: _____

D. Proceedings

CD-Rom Proceedings will be available on-site (will not be shipped to you). Includes all submitted manuscripts.
Received by February 1 ❑ $105USD February 2 - On-site ❑ $115USD

E. Pre & Post Conference Tours

Optional - Not included with registration fee.

Monday, April 14 - Pre-Conference Wuhan Tour (airfare not included) ❑ **$150USD** x _____ (# of guests = $_____)

Saturday, April 19 - Post-Conference Great Wall Tour ❑ **$110USD** x _____ (# of guests = $_____)

F. 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.)

Refund policy: No refunds will be made on cancellations received after February 1. All requests for refunds must be made in writing. There will be a $75USD processing fee for all refunds. See general information for detailed substitution and cancellation terms. Excursion Tours and Proceedings will not be refunded. **Pre-register and pay in full and save! After March 3 increased registration rates will apply. Sorry, no telephone registration**

Authorized Signature _____

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

❑ VISA ❑ Mastercard ❑ AMEX Card Security Code:* _____

*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 the credit card (Security Code appears on the front of American Express). Payment will not be processed without CSC code.

Credit Card No._____ Exp. Date:_____

Sincere Thanks to our PICALO 2008 Sponsors

Huagong Laser

Laser Industry Vendor Reception & TableTop Display • Thursday, April 17

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 Beth Cohen at +407.380.1553 or e-mail: picalo@laserinstitute.org.

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. 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.

Laser Institute of America
40th Anniversary
Laser Applications and Safety

13501 Ingenuity Drive, Suite 128
Orlando, Florida 32826 USA

PICALO 2008 Advance Program

www.laserinstitute.org/conferences/picalo