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Laser Materials Processing Conference
Klaus Kleine, Coherent Inc.
Friedhelm Dorsch, TRUMPF Laser and Systems GmbH

Laser Microprocessing Conference
Eric Mottay, Amplitude Systemes
Robert Braunschweig, LASEA, Inc.

Nanomanufacturing Conference
Yongfeng Lu, Univ. of Nebraska-Lincoln

Business Forum & Panel Discussion
Klaus Loeffler, TRUMPF Laser and Systems GmbH
Bo Gu, BOS Photonics



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CONFERENCE GENERAL CHAIR WELCOME



Christoph Leyens
Fraunhofer IWS
Dresden, Germany

The LIA, my co-chairs, all the committee members and I are looking forward to seeing you at the 37th International Congress on Applications of Lasers & Electro-Optics (ICALEO®), which this year returns to the hospitable city of Orlando.

We have worked hard to ensure that ICALEO 2018 lives up to the status as the most important laser material processing conference in the world, with an exciting program featuring over 200 presentations and posters on the latest in laser research. Many of these presentations are peer reviewed, ensuring ICALEO will provide another outstanding opportunity to learn about advances in laser material processing. As always, it will also be a great way to network with scientists, engineers and researchers from all over the world, to meet old friends and to make new friends.

I hope to see you all Sunday evening all the way to Thursday afternoon, attending the best ICALEO yet.

Christoph Leyens

ICALEO® 2018 CONFERENCE AGENDA*

This information is not updated. Please check the current agenda at https://www.lia.org/conferences/icaleo/program-information

Sunday, October 14

1:00pm ICALEO Registration Desk Open
4:00pm Welcome Celebration

Monday, October 15

6:30am LIA Laser Running Club
7:00am ICALEO Registration Desk Open
7:30am Appreciation Breakfast
ICALEO/Rosen Guest Exclusive Breakfast Lounge Open
9:00am Opening Plenary Session
10:10am Morning Break
Lunch on own
1:30pm LMP 1: Sub Plenary
LMF 1: Joint Sub Plenary with Nanomanufacturing
Poster Presentation Gallery Open
3:00pm Afternoon Break
3:30pm LMP 2: Cu- and Al-Welding I
LMP 3: 3D Metal Printing (SLM) I
LMF 2: Surface Functionalization
Nano 1: Nano Sensing and Characterization
5:00pm President's Reception

Tuesday, October 16

6:30am LIA Laser Running Club
7:30am ICALEO Registration Desk Open
ICALEO/Rosen Guest Exclusive Breakfast Lounge Open
8:10am LMP 4: Cu- and Al-Welding II
LMP 6: 3D Metal Printing (SLM) II
8:30am LMF 3: Surface Texturing
Nano 2: Fs Laser Processing and Fabrications
Business Forum and Panel Discussion
10:10am Morning Break
10:40am LMP 5: Welding: Process Control and Monitoring by OCT
Lunch on own
1:00pm Laser Industry Exhibitor Showcase
1:30pm LMP 7: Welding
LMP 8: Laser Metal Deposition I
LMF 4: Advanced High Power Microprocessing
Flash Poster Session
4:00pm Vendor Reception & Tabletop Display

Wednesday, October 17

6:30am LIA Laser Running Club
7:30am ICALEO Registration Desk Open
CALEO/Rosen Guest Exclusive Breakfast Lounge Open
8:30am LMP 9: Welding and Brazing
LMP 10: 3D Metal Printing (SLM) III
LMF 6: High Speed Microprocessing
Nano 3: Laser Processing of Battery Materials I
10:10am LMP 11: Lightweight Materials (CFRP)
LMP 12: Laser Metal Deposition II
LMF 5: Special Session: Advanced Laser Technologies for Microelectronics and IC Fabrication
LMF 7: Hard and Dielectric Material Processing
Nano 4: Laser Processing of Battery Materials II
1:30pm LMP 13: Cutting
LMP 14: Laser Metal Deposition III
LMF 8: Beam Shaping
Nano 5: Synthesis and Diagnostics of 2D Materials
2:50pm Poster Gallery Q & A with Authors
5:00pm LIA Annual Meeting & Awards Gala

Thursday, October 18

7:30am ICALEO Registration Desk Open
CALEO/Rosen Guest Exclusive Breakfast Lounge Open
8:30am LMP 15: Thick Metal and Hybrid Welding
LMP 16: Laser Metal Deposition IV
LMF 9: Biomedical Applications
Nano 6: Fs Laser Nanostructuring
10:10am Morning Break
10:40am LMP 17: Emerging Technologies
LMP 18: Surface Treatment
LMF 10: Micro-joining
Nano 7: Advanced Approaches in Nanoscience and Engineering
Lunch on own
1:30pm Closing Plenary Session
3:30pm Farewell Break and Ice Cream Social

This information is not updated. Please check the current agenda at https://www.lia.org/conferences/icaleo/program-information

*Program subject to minor changes

SPECIAL THANKS

We extend a special thank you to the ICALEO® 2018 International Advisory Board and our Cooperating Societies and Media Partners!

ICALEO 2018 International Advisory Board

Milan Brandt, RMIT, Melbourne, Victoria, Australia

Frank Brueckner, Fraunhofer IWS, Dresden, Germany

Yvonne Durandet, Swinburne Univ., Melbourne, Victoria, Australia

Wei Jun, SIMTECH, Singapore

Lin Li, The Univ. of Manchester, Manchester, Great Britain

Xinbing Liu, Panasonic Boston Laboratory, Newton, MA, USA

Henrikki Pantsar, TRUMPF Inc., Plymouth, MI, USA

Kunihiko Washio, Paradigm Laser Research Ltd., Tokyo, Japan

Rongshi Xiao, Beijing Univ. of Technology, Beijing, People's Republic of China

Jianhua Yao, Zhejiang Univ. of Technology, Hangzhou, People's Republic of China

Minlin Zhong, Tsinghua Univ., Beijing, People's Republic of China

ICALEO Cooperating Societies and Media Partners

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American Welding Society®

AILU Association of Industrial Laser Users

CLP Club Laser et Procédés

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ABOUT LIA AND ITS CONFERENCES

The Laser Institute of America (LIA) presents its 37th International Congress on Applications of Lasers & Electro-Optics (ICALEO). This conference provides an opportunity for researchers and end-users to meet and review the state-of-the-art in laser materials processing, laser micropressing and nanomanufacturing, and predict where the future will lead. LIA's conferences serve as the town square of the laser community, bringing the university researcher, the business executive, and the production floor user together under one roof for a unique and rewarding networking opportunity.

HIGHLIGHTED SESSIONS AND EVENTS

Welcome Celebration

Sunday, October 14 | 4:00pm

ICALEO®'s welcome celebration is always a memorably festive affair that brings together longtime and new attendees for an evening of snacks, beverages and live entertainment by the Beer's Law band, featuring Ron Schaeffer, Henrikki Pantsar and special guest musicians. Staged at the ICALEO venue, this gathering of old and new friends will also feature a raffle comprised of exciting door prizes. Don't miss out on this opportunity to socialize with the ICALEO gang in this informal setting.



Appreciation Breakfast

Monday, October 15 | 7:30am

Program Committee members and session chairs are invited to attend this informative start to the week's events on Monday, October 15 at 7:30am. Both new and veteran session chairs will receive important session materials and audio-visual tips, along with any last-minute updates to the program. Please plan to arrive in time to fuel up for a strong start to an exciting conference.

Opening Plenary Session: *Emerging Laser Technologies: a Path to Disruptive Businesses*

Monday, October 15 | 9:00am

Session Chair: Christoph Leyens, Fraunhofer IWS, Dresden, Germany

The ICALEO® Opening Plenary session is designed to enthrall you. Kicking off days of informative technical sessions, three renowned speakers will present on new advances in lasers and photonics, and offer insight into the challenges and rewards of launching a new laser business. You won't want to miss this enlightening plenary session!

Invited Plenary Speakers:

Islam Salama, Intel Corporation, Scottsdale, AZ, USA
Jason Eichenholz, Luminar Technologies, Inc., Orlando, FL, USA
Milton Chang, Incubic Management LLC, Los Altos Hills, CA, USA

President's Reception

Monday, October 15 | 5:00pm

Mingle with your colleagues in a fun and relaxed environment at ICALEO's premier networking event. Hosted by LIA President Milan Brandt, the President's Reception is the perfect place to interact with the LIA Executive Committee, Board of Directors, ICALEO Congress General Chair Christoph Leyens and Conference Chairs Klaus Kleine, Friedhelm Dorsch, Eric Mottay, Robert Braunschweig and Yongfeng Lu.

LIA'S LASER RUNNING CLUB

LIA's Laser Running Club

6:30am | Monday, October 15; Tuesday, October 16; Wednesday, October 17

Meet with your colleagues for our traditional sunrise run. Enjoy running through beautiful Orlando while catching up with your fellow early risers. A tradition begun by former LIA President Klaus Loeffler, the LIA Laser Running Club keeps you energized during the conference. Meet us in the hotel lobby with your Laser Running Club shirt on! If you are a newcomer, we will provide you with a shirt. Learn more about how to participate at the ICALEO registration desk.

HIGHLIGHTED SESSIONS & EVENTS

Business Forum & Panel Discussion: The Global Laser Market and Its Future Development

Tuesday, October 16 | 8:30am
Session Co-Chairs:



Klaus Loeffler
TRUMPF Laser and Systems GmbH
Ditzingen, Germany



Bo Gu
BOS Photonics
North Andover, MA USA

Laser market specialists from around the world provide exclusive information about the development and future trends in the different regions. Topics like the following will be discussed: China has installed more than 60,000 laser systems last year. Is this a opportunity or a threat for the non-Chinese laser businesses? Be part of the discussion: The forum is open for all attendees. This will also help to show you where your professional career might lead you to. Be part of the exciting network and exchange ideas with the speakers and attendees during the round table discussions.

Presenters

David Belforte, Industrial Laser Solutions
Global Overview of the Laser Market

Ulrich Zeltwanger, Zeltwanger Holding GmbH
Growing a Company with Lasers

Weija Yang, YSL Photonics
Development of Ultrafast Fiber Lasers and their Applications

Thomas Schopphoven, Fraunhofer ILT
Business Case: Extreme High Speed Cladding

Wenjie Lv, Jeijing JCZ Technology Co., Ltd.
Our Story on How to Run a Successful Small Company

Hongqiang Chen, GE Global Research Center
Laser Additive Manufacturing Business Cases at GE

Flame Chen, Hans Laser Smart Manufacturing Group
New Applications of Laser Cutting Technology

Bo Gu, BOS Photonics
Laser Market in China

Laser Industry Vendor Showcase & Reception

Tuesday, October 16 | Showcase: 1:00pm, Reception: 4:00pm

Enjoy drinks and hors d'oeuvres while sharing ideas with colleagues and suppliers representing more than 200 companies and organizations from over 30 countries. Discuss equipment and applications in a relaxed setting after the day's technical sessions. To participate as an ICALEO sponsor or vendor, contact the LIA Marketing Department at marketing@lia.org.



Sponsors and Vendors registered as of August 17th in alphabetical order.

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HIGHLIGHTED SESSIONS & EVENTS

LIA Annual Meeting & Awards Gala featuring the Arthur L. Schawlow Award Presentation

Wednesday, October 17 | 5:00pm

Celebrate the 50th Anniversary of LIA!

Join your fellow ICALEO 2018 attendees, conference chairs, and LIA staff in commemorating the 50th anniversary of the Laser Institute of America. Don't miss this once-in-a-lifetime event, as we honor our history and look towards the future of the laser industry.

The 2018 Arthur L. Schawlow Award is presented to Don Scifres.

Dr. Don Scifres is a recognized pioneer in high power semiconductor diode laser arrays, whose work enabled the first generation of diode pumped solid state lasers, telecom amplifiers and led to the development of fiber lasers.

About the Arthur L. Schawlow Award

One of LIA's most prestigious honors, the Arthur L. Schawlow Award recognizes outstanding, career-long contributions to basic and applied research in laser science and engineering, leading to fundamental understanding of laser materials interaction and/or transfer of laser technology for increased application in industry, medicine and daily life.

The Schawlow honoree will be acknowledged at the LIA Awards Gala, during which the recipient will give an address.



The Awards Gala is sponsored by: edgewave

Closing Plenary Session

Thursday, October 18 | 1:30pm
Session Chair: Christoph Leyens, Fraunhofer IWS, Dresden, Germany

To close out the conference, we offer you a plenary session that will hopefully broaden your horizons a bit and give you something to think about on your way home. We hope to see you to this exciting session.

Invited Closing Plenary Speakers:
Andres Fabian Lasagni, Technische Univ. Dresden, Dresden, Germany
Youping Gao, Castheon Inc., Thousand Oaks, CA, USA
Eckhard Beyer, Fraunhofer IWS, Dresden, Germany



Student Paper Award Contest

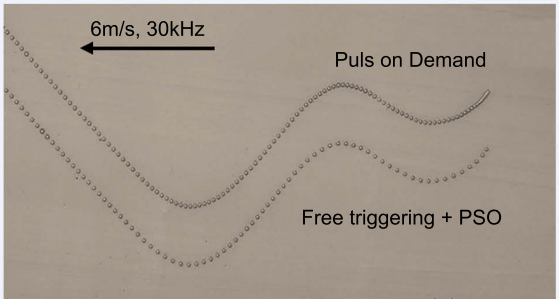
Future generations of laser industry experts have been contributing papers at ICALEO for 19 years. LIA once again will recognize the importance of student contributions with the 20th Annual ICALEO Student Paper Award. Not only does the student paper contest illuminate the great work of up-and-coming researchers, but cash awards will be presented to the first-, second- and third-place winners. Winning papers are also given the opportunity to submit to LIA's *Journal of Laser Applications®* for publication (papers will undergo a peer-review process). Student papers accepted for competition will be judged by an international panel based on originality of topic/material presented, scientific and technical merit, and presentation quality. Professors will not judge their own students' papers. Prize winners will be announced during the Closing Plenary Session of ICALEO on Thursday, October 18th.

ps- and fs-laser

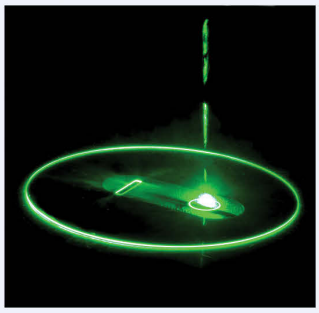
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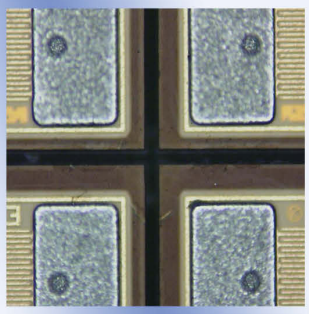


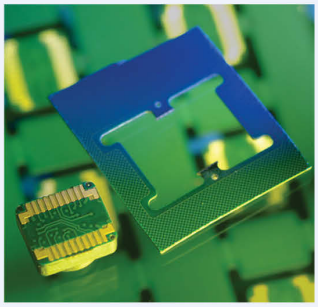
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LASER MATERIALS PROCESSING CONFERENCE

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Conference Co-chairs:

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Klaus Kleine
Coherent Inc.
Santa Clara, CA USA



Friedhelm Dorsch
TRUMPF Laser and Systems GmbH
Ditzingen, Germany

The Laser Materials Processing (LMP) conference will feature presentations of latest progresses in processing with state-of-the-art advanced laser systems of high brightness, as well as innovative hybrid processes. The presentations cover most areas of laser materials processing, from cutting and drilling, to surface treatment and material joining and generation. In joining processes laser welding of non-ferrous materials like aluminum, which are of major interest in light weight construction and e-mobility applications like copper joining, are hot topics. Another growing area of high interest are additive manufacturing processes like laser metal deposition (LMD) and selective laser melting (SLM), also referred to as 3D-laser printing. Both enable the generation of three-dimensional shapes of specific attributes and high complexity. Attend LMP for a comprehensive insight into these latest advances.

LMP Session 1: Sub Plenary

Monday, October 15 | 1:30pm
Session Chair: Klaus Kleine, Coherent Inc., Santa Clara, CA, USA

Novel Optical Concept for Line Beam Optics for Large Area Thermal Processing (101)
Martin Huonker, Christoph Tillkorn, Stefan Dorer, TRUMPF Laser GmbH; Michael Lang, TRUMPF Laser- und Systemtechnik GmbH

In-Situ High Speed Diagnosis – A Quantitative Analysis of Melt Flow Dynamics Inside Cutting Kerfs During Laser Fusion Cutting with 1 µm Wavelength (102
Dennis Arntz, Chair for Laser Technology LLT, RWTH Aachen Univ.; Dirk Petring, Frank Schneider, Fraunhofer Inst. for Laser Technology ILT; Reinhart Poprawe, Chair for Laser Technology LLT, RWTH Aachen Univ.

Development Status and Prospect of Laser Hybrid Manufacturing Technology (103)
Jianhua Yao, Liang Wang, Bo Li, Qunli Zhang; Zhejiang Univ. of Technology

Program Committee

Prabu Balu, Coherent Inc.., Santa Clara, CA, USA
Paul Denney, IPG Photonics, Oxford, MA, USA
Masoud Harooni, TRUMPF Inc., Hoffman Estates, IL, IUSA
Markus Kogel-Hollacher, Precitec Optronik GmbH/Precitec GmbH & Co. KG, Neu-Isenburg, Germany
JP Lavoie, Coherent, Inc., Santa Clara, CA, USA
M. Angeles Montealegre, Talens Systems-EtxeTar Group, Elgoibar, Spain
Barbara Previtali, Politecnico Di Milano, Milano, Italy
Antti Salminen, Lappeenranta Univ. of Technology, Lappeenranta, Finland
Geoff Shannon, Amada Miyachi America Inc., Monrovia, CA, USA
Verena Wippo, Laser Zentrum Hannover e.V., Hannover, Germany
Gerd Witt, Univ. Duisburg-Essen, Duisburg, Germany

LMP Session 2: Cu- and Al-Welding I

Monday, October 15 | 3:30pm
Session Chair: Masoud Harooni, TRUMPF Inc., Hoffman Estates, IL, USA

Stable Keyhole Welding of 1 mm Thick Copper with a 600 Watt Blue Laser System (201)
Mark Zediker, Robert Fritz, Mathew Finuf, Jean Michel Pelaprat, NUBURU Inc.

Influencing the Electrical Properties of Laser Beam Vacuum-Welded Cu-Al Mixed Joints (202)
Niklas Holtum, Simon Olschok, Uwe Reisgen, RWTH Aachen Univ. Welding and Joining Inst.

Tensile Shear Strength of Laser Copper Welds (203)
Nathanael Eisenreich, Robert Bosch GmbH; Michael Aeckerle, Ernst Abbe Hochschule Jena; Christoph Bantel, Robert Bosch GmbH; Alexander Olowinsky, Fraunhofer Inst. for Laser Technology ILT

Numerical Analysis of the Effect of Welding Positions on Formation Quality during Laser Welding of TC4 Titanium Alloy Parts in Aerospace Industry (204)
Peng Wen, Doruk Yelkenci, Jiunn Chen, Baohua Chang, Dong Du, Jiguo Shan, Tsinghua Univ.

LMP Session 3: 3D Metal Printing (SLM) I

Monday, October 15 | 3:309m
Session Chair: Barbara Previtali, Politechnico di Milano, Milan, Italy

From Starting Powder to the Produced Aluminium Part: A Study of the SLM process (301)
Cassiopée Galy, Emilie Le Guen, Corinne Arvieu, Eric Lacoste, I2M

Generating Support Structures by Topology Optimization for Use in LBM (302)
Katharina Bartsch, Hamburg Univ. of Technology (TUHH); Melanie Gralow, Fritz Lange, Claus Emmelmann, Fraunhofer-

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Gesellschaft zur Förderung der angewandten Forschung e.V.

Functional Integration Approaches via Laser Powder Bed Processing (303)
Juliane Moritz, Fraunhofer Inst. for Material and Beam Technology IWS; André Seidel, Technische Universität Dresden, Fraunhofer Inst. for Material and Beam Technology IWS; Ana Daniela Brandao, Laurent Pambaguian, European Space Research and Technology Centre ESTEC; Mirko Riede, Fraunhofer Inst. for Material and Beam Technology IWS; Elena Lopez, Fraunhofer Inst. for Material and Beam Technology; Frank Brückner, Fraunhofer Inst. for Material and Beam Technology IWS, Luleå Univ. of Technology; Christoph Leyens, Fraunhofer Inst. for Material and Beam Technology IWS

Industrial 3D Printing for Modern Machine and Handling Systems – Potential and Solutions (304)
Michael Gorn, Bionic Production AG; Georg Cerwenka, Melanie Gralow, Claus Emmelmann, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V.

LMP Session 4: Cu- and Al-Welding II

Tuesday, October 16 | 8:30am
Session Chair: Markus Kogel-Hollacher, Precitec Optronik GmbH, Neu-Isenburg, Germany

Closed-Loop Quality Control System for Remote Laser Welding of Aluminium Components (402)
Pasquale Franciosa, Armando Serino, Rehab Al Botros, Darek Ceglarek, The Univ. of Warwick

Microstructure of Laser Pressure Weld of Pure Aluminium (403)
Jingquan Zhang, Ting Huang, Rongshi Xiao, Beijing Univ. of Technology

Influence of Ultrasonic Amplitude and Position in the Vibration Distribution on the Microstructure of a Laser Welded Aluminum Alloy (404)
Sarah Nothdurft, Laser Zentrum Hannover e.V.; Hendrik Ohrdes, Jens Twiefel, Jörg Wallaschek, Inst. of Dynamics and Vibration Research; Maximilian Mildebrath, Hans Jürgen Maier, Thomas Hassel, Institut für Werkstoffkunde; Ludger Overmeyer, Laser Zentrum Hannover e.V.

Wobble-welding of Copper and Aluminum Alloys with Inline Coherent Imaging (406)
Christopher Galbraith, Leandro Da Costa, Mohamed Siblini, Paul Webster, IPG Photonics (Canada) Inc.

LMP Session 5: Welding - Process Control and Monitoring by OCT

Tuesday, October 16 | 10:40am
Session Chair: Masoud Harooni, TRUMPF Inc., Hoffman Estates, IL, USA

Process Control and Quality Assurance in Remote Laser Beam Welding by Optical Coherence Tomography (501)
Christian Stadter, Maximilian Schmoeller, Technical Univ. of Munich; Martin Zeitler, Volkan Tueretkan, Ulrich Munzert, Blackbird Robotersysteme GmbH; Michael Zaeh, Technical Univ. of Munich

Inline Weld Depth Measurement for High Brilliance Laser Beam Sources using Optical Coherence Tomography (502)
Maximilian Schmoeller, Christian Stadter, Stefan Liebl, Michael Zaeh, Technical Univ. of Munich

Remote Laser Beam Welding with OCT Seam Tracking (503)
Jan-Patrick Hermani, Friedhelm Dorsch, Stephan Becker, Martin Stambke, TRUMPF Laser- und Systemtechnik GmbH

In-process Control of Penetration Depth for High Power Laser Welding of Thick Dissimilar Joints of Steel and Aluminum (504)
Rabi Lahdo, Oliver Seffer, Stefan Kaierle, Ludger Overmeyer, Laser Zentrum Hannover e.V.

LMP Session 6: 3D Metal Printing (SLM) II

Tuesday, October 16 | 8:10am
Session Co-Chairs: M. Angeles Montealegre, Talens Systems, Elgoibar, Spain; Friedhelm Dorsch, TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, Germany

Multimaterial Bathless Stereolithography using Aerosol Jet Printing and UV Laser based Polymerization (601)
Arndt Hohnholz, Kotaro Obata, Daniel Albrecht, Jürgen Koch, Gerrit Hohenhoff, Oliver Suttmann, Ludger Overmeyer, Stefan Kaierle, Laser Zentrum Hannover e.V.

Track Geometry Variations in Selective Laser Melting Processes (602)
Joerg Volpp, Luleå Univ. of Technology; Frank Brückner, Fraunhofer-Institut für Werkstoff- und Strahltechnik; Alexander F.H. Kaplan, Luleå Univ. of Technology,

Thermal Emission-Based Geometry Determination of Hot Surfaces Generated During Laser Material Processing (603)
Michael Sawannia, Peter Berger, Michael Jarwitz, Rudolf Weber, Thomas Graf, IFSW, Univ. of Stuttgart

Effect of Process Parameters on Thin-wall Distortion in Selective Laser Melting (604)
Chen-Nan Sun, Wai Jack Sin, Singapore Inst. of Manufacturing Technology (SIMTech), Agency for Science, Technology and Research (A*STAR); Guglielmo Vastola, Inst. of High Performance Computing (IHPC), A*STAR; N Sridhar, IHPC, A*STAR; Mui Ling Nai, SIMTech, A*STAR

Study on Mechanism of Ductility Improvement for SLM-process Ti6Al4V Alloy (605)
Yangli Xu, Dongyun Zhang, Yanwu Guo, Songtao Hu, Inst. for Laser Engineering, Beijing Univ. of Technology

First Investigation on Processing Parameters for Laser Powder Bed Fusion of NiMnGa Magnetic Shape Memory Alloy (606)
Ville Laitinen, Antti Salminen, Kari Ullakko, Lappeenranta Univ. of Technology

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Wavelength Dependent Laser Material Processing of Ceramic Materials (607)
Stefan Polenz, André Seidel, Juliane Moritz, Fraunhofer Inst. for Material and Beam Technology; Willy Kunz, Fraunhofer Inst. for Ceramic Technologies and Systems; Mirko Riede, Fraunhofer Inst. for Material and Beam Technology; Elena López, Fraunhofer Inst. for Material and Beam Technology; Frank Brückner, Christoph Leyens, Fraunhofer Inst. for Material and Beam Technology

Micro-arc Oxidation Process of the Porous Titania Coating on Titanium Alloy Produced by Selective Laser Melting (609)
Ye Wang, Guolong Wu, Jianhua Yao, Zhejiang Univ. of Technology

LMP Session 7: Welding

Tuesday, October 16 | 1:30pm
Session Chair: Prabu Balu, Coherent Inc., Santa Clara, CA, USA

Laser-Laser Hybrid Welding for Joining of Challenging Materials (701)
Wojciech Suder, Supriyo Ganguly, Stewart Williams, Cranfield Univ.; Keelan Keogh, Simon Kirk, United Kingdom Atomic Energy Authority, Culham Science Centre

Laser Welding with Beam Shaping – Latest Application Results (702)
Tim Hesse, Nicolai Speker, Patrick Haug, Johannis Seebach, TRUMPF Laser- und Systemtechnik GmbH; David Havrilla, TRUMPF Michigan; Jan-Patrick Hermani, TRUMPF Laser- und Systemtechnik GmbH

Investigation of the Influence of Superimposed Intensity Distributions on the Spatter Behavior in Laser Welding of Steel using Online X-ray Diagnostics (703)
Michael Jarwitz, Jannik Lind, Rudolf Weber, Thomas Graf, IFSW, Univ. of Stuttgart; Nicolai Speker, TRUMPF Laser- und Systemtechnik GmbH; Patrick Haug, TRUMPF Laser- und Systemtechnik GmbH

Investigating the Effect of Beam Parameters on Joint Formation in Laser Beam Welding of T-joint in Structural Steel (704)
Anna Unt, Antti Salminen, Stefan Grünenwald, Ilkka Poutiainen, Lappeenranta Univ. of Technology

Dynamic Laser Coupling Efficiency during Laser Spot Welding of 316L Stainless Steel (705)
Brian Simonds, NIST; Jeffrey Sowards, NASA; Josh Hadler, Erik Pfeif, Boris Wilthan, Jack Tanner, Chandler Harris, Paul Williams, NIST

Power and Scanning Speed Influence on Bead Quality for Lap Joint Laser Welding (706)
Luiz Eduardo dos Santos Paes, Milton Pereira, Adriano de Souza Pinto Pereira, Carlos Enrique Niño Borhórquez, Walter Lindolfo Weingaertner, Laboratory of Mechanical Precision / Laser - LMP-Laser

LMP Session 8: Laser Metal Deposition I

Tuesday, October 16 | 1:30pm

Laser Enhancement of Wire Arc Additive Manufacturing (801)
Jonas Näsström, Luleå Univ. of Technology; Frank Brückner, Fraunhofer - Institut für Werkstoff- und Strahltechnik; Luleå Univ. of Technology; Alexander Kaplan, Luleå Univ. of Technology

Wire-based LMD for Repair and AM Applications (802)
Jana Kelbassa, Andres Gasser, Jan Bremer, Fraunhofer ILT – Inst. for Laser Technology; Oliver Pütsch, RWTH Aachen Univ. TOS - Chair of Optical Systems Technologies

Manipulating the Melt Propagation of Short Arc GMAW with Diode Lasers < 1 kW for Improvement in Flexibility and Process Robustness (803)
Jan Leschke, Kenneth Pacardo, Laser Zentrum Hannover e.V.; Erik Zokoll, ISF Welding and Joining Inst.; Jörg Hermsdorf, Laser Zentrum Hannover e.V.; Rahul Sharma, ISF Welding and Joining Inst.; Stefan Kaierle, Laser Zentrum Hannover e.V; Uwe Reisgen, ISF Welding and Joining Inst.

Process Characterization in Laser Metal Deposition of EN AC-43000 (804)
Michael Guepner, Tristan Drawert, Jens Bliedtner, Univ. of Applied Sciences Jena

Using Laser Metal Deposition for Improving Weld Seam Quality in Joining of Laser Additive Manufactured Aluminium Parts (805)
Frank Beckmann, Claus Emmelmann, Fraunhofer IAPT; Philip Bendzko, Hamburg Univ. of Technology

Customized Exposure Strategies for Manufacturing Hybrid Parts by Combining Laser Beam Melting and Sheet Metal Forming (806)
Florian Huber, Thomas Papke, Marion Merklein, Michael Schmidt, Friedrich-Alexander-Universität Erlangen-Nürnberg

Control of Dilution and Distortion in Laser Metal Deposition (LMD) Process (807)
Nazmul Alam, CSIRO; Durul Huda, Swinburne Univ.

LMP Session 9: Welding and Brazing

Wednesday, October 17 | 8:30am
Session Chair: Klaus Kleine, Coherent Inc., Santa Clara, CA, USA

Numerical Investigation of Residual Stresses Caused from Laser Induced Melting of Carbon Steel (901)
Haram Yeo, Hyungson Ki, Ulsan National Inst. of Science and Technology (UNIST)

Mechanical and Microstructural Properties of Advanced High Strength Steels Processed by Laser Welding into the Bainitic Range (902)
Raquel Mansur, Rafael Siqueira, Sheila Carvalho, Vagner Braga, IEaV; Vinicius Mansur, Petrobras; Milton Lima, IEaV

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Influence of the Brazing Speed on the Seam Characteristics (903)
Eva Heuberger, Inst. of Photonic Technologies (LPT), Friedrich-Alexander-Universität Erlangen-Nürnberg; Daniel Schmid, Jan-Philipp Weberpals, AUDI AG; Felix Tenner, Michael Schmidt, Inst. of Photonic Technologies (LPT), Friedrich-Alexander-Universität Erlangen-Nürnberg

Multi Spot Modules to Improve Joining Processes Due to Tailored Spot Geometries (904)
Axel Luft, Markus Baumann, Laserline GmbH

LMP Session 10: 3D Metal Printing (SLM) III

Wednesday, October 17 | 8:30am
Session Chair: Verena Wippo, Laser Zentrum Hannover e.V., Hannover, Germany

Estimation of Melt Pool Size by Complementary Use of External Illumination and Process Emission in Coaxial Monitoring of Selective Laser Melting (1001)
Matteo Pacher, Ali Demir, Leonardo Caprio, Luca Mazzoleni, Barbara Previtali, Politecnico di Milano

Study on the Effect of Fluid Flowing and Interface of Gas and Liquid in Molten Pool on SLM Process (1002)
Dongyun Zhang, Yinkai Xie, Pudan Zhang, Lingshan Li, Xuping Wu, Inst. for Laser Engineering, Beijing Univ. of Technology, Beijing Engineering Research Center of 3D Printing for Digital Medical Health, Beijing International Cooperation Base for Digital Medical Health; Zhipeng Gao, China South Industry Academy

Laser Additive Manufacturing of Zn Metal Parts for Biodegradable Implants: Effect of Gas Flow on Evaporation and Formation Quality (1003)
Yanzhe Chen, Tsinghua Univ.; Maximilian Voshage, RWTH Aachen Univ.; Peng Wen, Tsinghua Univ.; Lucas Jauer, Reinhart Poprawe; Johannes Henrich Schleifenbaum, Fraunhofer Inst. for Laser Technology (ILT)

Study on the Element Segregation and Crystal Growth Behavior of Carbon Nanotube Reinforced IN718 Alloy Fabricated by Laser Cladding (1004)
Yuan Chen, Qunli Zhang, Zhehe Yao, Jianhua Yao, Inst. of Laser Advanced Manufacturing, Zhejiang Univ. of Technology

LMP Session 11: Lightweight Materials (CFRP)

Wednesday, October 17 | 10:10am

Automatic Control for Laser-based Repair Preparation of Composites by Fibre Orientation Detection and Short Coherent Interferometry (1101)
Hagen Dittmar, Peter Jaeschke, Oliver Suttmann, Stefan Kaierle, Ludger Overmeyer, Laser Zentrum Hannover e.V.

High Precision Laser Macro-Drilling of CFRP with a New Nanosecond Pulsed Laser – Optimized Towards Industrial Needs (1102)
Richard Staehr, Stefan Bastick, Sven Bluemel, Peter Jaeschke, Oliver Suttmann, Stefan Kaierle, Ludger Overmeyer, Laser Zentrum Hannover e.V.; Jan-Philipp Negel, TRUMPF Laser GmbH

Effect of Processing Parameters on Cut Quality in Fiber Laser Cutting of CFRP (1103)
Sehyeok Oh, Hyungson Ki, Ulsan National Inst. of Science and Technology (UNIST)

Evaluation of Material Based Influences at Laser Based Heat Conduction Welding of CFRP (1104)
Verena Wippo, Peter Jaeschke, Oliver Suttmann, Stefan Kaierle, Ludger Overmeyer, Laser Zentrum Hannover e.V.

Laser Forming of Sandwich Panels with Metal Foam Cores (1105)
Tizian Bucher, Steven Cardenas, Columbia Univ.; Ravi Verma, Wayne Li, Boeing; Lawrence Yao, Columbia Univ.

LMP Session 12: Laser Metal Deposition II

Wednesday, October 17 | 10:10am
Session Chair: Mark Zediker, Nuburu Inc.,

Advanced Manufacturing Approach via the Combination of SLM and LMD (1202)
Jakob Schneider, André Seidel, Technische Universität Dresden, Fraunhofer Inst. for Material and Beam Technology; Mirko Riede, Fraunhofer Inst. for Material and Beam Technology; Elena Lopez, Fraunhofer Inst. for Material and Beam Technology; Frank Brückner, Fraunhofer Inst. for Material and Beam Technology, Luleå Univ. of Technology; Christoph Leyens, Technische Universität Dresden, Fraunhofer Inst. for Material and Beam Technology; Johannes Gumpinger, ESA/ESTEC, European Space Research and Technology Centre

Surface Modification of Additive Manufactured Gamma Titanium Aluminide Hardware (1203)
André Seidel, Fraunhofer Inst. for Material and Beam Technology (IWS); Andreas Davids, Technische Universitaet Dresden; Polenz Stefan, Fraunhofer Inst. for Material and Beam Technology (IWS); Ariane Straubel, Technische Universitaet Dresden; Tim Maiwald, Juliane Moritz, Jakob Schneider, Fraunhofer Inst. for Material and Beam Technology (IWS); Axel Marquardt, Fraunhofer Inst. for Material and Beam Technology & Technische Univ. Dresden

Microstructural Characterization of Al2O3-ZrO2 Ceramic by Laser Direct Metal Deposition (1204)
Fazhi Li, Yi Zhang, Hunan Univ.

Investigation on the Effect of Laser Remelting for Laser Cladding Nickel Based Alloy (1205)
Yanzhe Zhao, Shandong Univ.; Jie Sun, Shandong Univ.; Kai Guo, Shandong Univ.; Jianfeng Li, Shandong Univ.

LMP Session 13: Cutting

Wednesday, October 17 | 1:30pm

Efficient Separation of Battery Materials Using Remote Laser Cutting – High Output Performance, Contour Flexibility and Cutting Edge Quality (1301)
Robert Baumann, Technical Univ. Dresden TUD, Fraunhofer Institut für Werkstoff und Strahltechnik IWS; Andrés Lasagni,

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Patrick Herwig, Andreas Wetzig, Fraunhofer Institut für Werkstoff und Strahltechnik IWS; Christoph Leyens, Technical Univ. Dresden TUD, Fraunhofer Institut für Werkstoff und Strahltechnik IWS; Eckhard Beyer, Fraunhofer Institut für Werkstoff und Strahltechnik IWS

Advances in Fiber Laser Cutting (1302)
Brian Victor, Ken Gross, Dahv Kliner, Michael Atchley, nLIGHT

Advantages of Laser Cutting of Metals at High Peak Power (1303)
Rouzbeh Sarrafi, Andrey Nemera, Sean Dennigan, Marco Mendes, Vijay Kancharla, IPG Photonics

Demonstration of a Mobile Laser Cutting System for Complex Rescue Operations (1304)
Alexander Brodesser, Christian Hennigs, Laser Zentrum Hannover e.V.; Alexander Pfaff, SGE Spezialgeräteentwicklung GmbH; Robert Grafe, Fire Department Dortmund; Michael Hustedt, Stefan Kaierle, Laser Zentrum Hannover e.V.

Investigation of Assist Gas Flow to Improve Slope Angle of Kerf in Thick Plate Cutting of Mild Steel by Fiber Laser (1305)
Kyo Kitagawa, Yasuhiro Okamoto, Okayama Univ.; Hiroaki Ishiguro, Akihiro Sugiyama, Hironobu Miyoshi, Ryohei Ito, AMADA CO., LTD; Akira Okada, Okayama Univ.

LMP Session 14: Laser Metal Deposition III

Wednesday, October 17 | 1:30pm
Session Chair: Paul Denney, IPG Photonics, Oxford, MA, USA

Hyperspectral and Thermal Monitoring of Laser Cladding Process (1401)
Margot Lison, Vrije Univ. Brussel

In Situ Observation of CoCr-alloy Layer Formation by Multi Laser Coating (1402)
Yuji Sato, Osaka Univ.; Takahisa Shobu, Japan Atomic Energy Agency; Yoshinori Funada, Yorihiro Yamashita, Industrial Research Inst. of Ishikawa; Nobuyuki Abe, Masahiro Tsukamoto, Osaka Univ.

Powder Catchment in Laser Metal Deposition (1403)
Himani Siva Prasad, Luleå Univ. of Technology; Frank Brückner, Fraunhofer IWS; Luleå Univ. of Technology; Alexander Kaplan, Luleå Univ. of Technology

Microstructural, Mechanical and Thermo-physical Characterization of Hypereutectic AlSi40 Fabricated by Selective Laser Melting (1404)
Michael Mueller, Mirko Riede, Fraunhofer Inst. for Material and Beam Technology IWS Dresden; Sebastian Eberle, Arnd Reutlinger, Kampf Telescope Optics GmbH (KTO); Ana Brandão, ESTEC: European Space Research and Technology Centre; André Seidel, Technische Universität Dresden, Fraunhofer Inst. for Material and Beam Technology IWS; Elena López, Frank Brückner, Fraunhofer Inst. for Material and Beam Technology IWS Dresden

Influence of Shielding Environment on Solidification Cracking in the Laser Deposition of Aermet®100 on 300M Steel (1405)
Cameron Barr, Stephen Sun, Milan Brandt, RMIT Univ.

LMP Session 15: Laser Metal Deposition III

Thursday, October 18 | 8:30am
Session Chair: Antti Salminen, Lappeenranta Univ. of Technology, Lappeenranta, Finland

Laser-Multipass-Narrow-Gap-Welding of Nickel Superalloy 617 OCC (1501)
Benjamin Kessler, Dirk Dittrich, Berndt Brenner, Jens Standfuss, Eckhard Beyer, Christoph Leyens, Fraunhofer Inst. for Material and Beam Technology IWS

On the Search for the Origin of the Bulge in High Power Laser Beam Welding (1502)
Antoni Artinov, Nasim Bakir, Marcel Bachmann, Andrey Gumenyuk, Federal Inst. of Material Research and Testing; Suck-Joo Na, Department of Mechanical Engineering, KAIST; Michael Rethmeier, Federal Inst. of Material Research and Testing

Comparison of 1G and 2G Position Laser Welding of Thick Section D6A Ultra-high Strength Steel (1503)
Xianfeng Shen, Inst. of Machinery Manufacturing Technology, Academy of Engineering Physics; Lin Li, Wei Guo, The Univ. of Manchester; Wenhua Teng, Zhiyao Cheng, Inst. of Machinery Manufacturing Technology, Academy of Engineering Physics

LMP Session 16: Laser Metal Deposition IV

Thursday, October 18 | 8:30am
Session Chair: JP Lavoie, Coherent Inc., Santa Clara, CA, USA

Laser Ablation of Additively Manufactured Surfaces at Oblique Angles of Incidence (1601)
Sina Hallmann, Fraunhofer Research Institution for Additive Manufacturing IAPT; René Nodop, Hamburg Univ. of Technology; Claus Emmelmann, Fraunhofer Research Institution for Additive Manufacturing Technologies IAPT

Laser Metal Deposition of White Cast Iron Powder on White Cast Iron Substrate (1602)
Stephen Sun, Chengbo Zhu, Ian Fordyce, Mark Easton, Martin Leary, Milan Brandt, RMIT Univ.

Effects of Multidimensional High-Frequency Vibration on Laser Cladding of SS316L Alloy (1603)
Zhehe Yao, Yanbin Nie, Jianhua Yao, Qunli Zhang, Zhejiang Univ. of Technology

Laser Cladding Single Crystalline Repair Strategies for Flat and Notched Ni-Based Superalloys (1604)
Milton Pereira, Adriano Pereira, Walter Weingaertner, Márcio Fredel, Federal Univ. of Santa Catarina; Stefan Kaierle, Laser Zentrum Hannover e.V.; Camiel van Hooff, KPN

Effects of Assisted Gas on Inconel 718 Alloy Coating Fabricated via Laser Cladding (1605)
Qunli Zhang, Jie Zhang, Dong Li, Liang Wang, Jianhua Yao, Zhejiang Univ. of Technology

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LASER MATERIALS PROCESSING CONFERENCE

LMP Session 17: Emerging Technologies

Thursday, October 18 | 10:40am
Session Chair: Friedhelm Dorsch, TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, Germany

3D/6D Calibration and Real-time Focus Shift Compensation for Automated 30 kW Laser Remote Scanner (1701)
Georg Cerwenka, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V.; Jörg Wollnack, Thomas Krähling, Hamburg Univ. of Technology (TUHH); Rekha Jayaprakash, Claus Emmelmann, Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V.

Development of a General Approach for the Location-Independent Optimization of Production Processes Using Beam Welding Processes as an Example (1702)
Niklas Holtum, Oliver Engels, Simon Olschok, Uwe Reisgen, RWTH Aachen Univ. Welding and Joining Inst.

Advantages of an Adaptive Absorption Coefficient for Simulations of iterative Laser Beam Processes (1703)
Helge Kügler, Frank Vollertsen, BIAS - Bremer Institut für angewandte Strahltechnik GmbH and Univ. of Bremen

Laser Assisted Thermit Coating of Aluminium Alloy with Air and Argon Shielding (1704)
Manoj Rathod, Bhushan Patil, Axayya Alloys Pvt. Ltd; Gade Manasi, Ninad Parashtekar, College of Engineering Pune

LMP Session 18: Surface Materials

Thursday, October 18 | 10:40am
Session Chair: Anna Unt, Lappeenranta Univ. of Technology, Finland

Laser Induced Heating for Enhanced Fatigue Life of Aluminum Alloys (1801)
Milton Lima, Sheila Carvalho, Rafael Siqueira, Mauricio Cunha, Inst. for Advanced Studies; Camila Goncalves, Leonardo Godefroid, Federal Univ. of Ouro Preto

Laser Polishing of Additively Manufactured CoCr and Ti6Al4V Parts and Subsequent Stress Relieving (1802)
Wojciech Gora, Heriot-Watt Univ.; Yingtao Tian, Univ. of Manchester; Mark McDonald, Heriot-Watt Univ.; Marcus Ardron, Renishaw PLC; Stuart Stevenson, Renishaw PLC; Philip Prangnell, Univ. of Manchester; Nicholas Weston, Renishaw PLC; Duncan Hand, Heriot-Watt Univ.

Fiber Laser Cladding of 17-4 PH Stainless Steel on Low Carbon Steel Alloy for Enhanced Surface Properties (1803)
Ravi Rajamure, Joseph Roy, Vijay Kancharla, Marlborough

Laser Surface Modification on Mg-Gd-Ca Alloy for Biocompatibility Enhancement (1804)
Jiaru Zhang, Yingchun Guan, Wenting Lin, Xuenan Gu, Beihang Univ.

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LASER MICROPROCESSING CONFERENCE

Conference Co-chairs:

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Eric Mottay
Amplitude Systemes
Pessac, France



Robert Braunschweig
LASEA, Inc.
El Cajon, CA, USA

Laser microprocessing is at the heart of modern manufacturing. Smartphones, biosensors, medical devices, and memory chips rely on the precision and quality of the laser. This year, ICALEO's Laser Microprocessing conference covers the latest innovations in laser application developments. The conference highlights progress on high speed, high throughput microprocessing enabled by new laser sources; advanced beam handling and delivery; and fine understanding of laser-matter interaction. Sessions dedicated to surface processing and functionalization, glass and dielectric material processing outline the versatility of the laser process. Invited talks and sessions focused on biomedical and micro-electronics applications show the way to the future. An optional peer-review process outlines outstanding papers, further improving our already high-level technical conference. We are looking forward to meeting friends and colleagues, and to welcoming new attendees, for this exciting conference.

LMF Session 1: Sub Plenary with Nanomanufacturing

Monday, October 15 | 1:30pm
Session Co-chairs: Yongfeng Lu, Univ. of Nebraska-Lincoln, Lincoln, Nebraska, USA; Eric Mottay, Amplitude Systemes, Pessac, France

Nano and Microscale Light-based 3D Bioprinting: An Enabling Technology for Regenerative Medicine (M101)
Shaochen Chen, UC San Diego

LMF Session 2: Surface Functionalization

Monday, October 15 | 3:30pm
Session Chair: Corey Dunsky, Aeos Consulting, Los Gatos, CA, USA

Unique Micro-nano Structured Superhydrophilic Surfaces with Long-term Stability via Femtosecond Laser (M201)
Weijian Liu, Tsinghua Univ.; Hongyu Zheng, Singapore Inst. of Manufacturing Technology (SIMTech); Yee Cheong Lam, Nanyang Technological Univ. (NTU)

Flexible Control over Optical Reflection Property of Metallic Material via Ultrafast Laser (M202)
Xiao Luo, Mingyong Cai, Weijian Liu, Changhao Chen, Rui Pan, Minlin Zhong, the School of Materials Science and Engineering, Tsinghua Univ.

Femtosecond Laser Pulse Inducing Hydrophilicity and Hydrophobicity on Polycarbonate Surfaces (M203)
Zhongke Wang, Singapore Inst. of Manufacturing Technology (SIMTech); Mingyong Cai, Xiao Luo, Changhao Chen, Rui Pan, Hongjun Zhang, Minlin Zhong, Tsinghua Univ.

The formation of Osseointegrating (Bone Integrating) Surfaces on Titanium by Laser Irradiation (M204)
Jan Frostevarg, Laser Nova AB; John Powell, Jan Frostevarg, Luleå Univ. of Technology; Anders Palmquist, Rickard Brånemark, Univ. of Gothenburg; Alexander Kaplan, Luleå Univ. of Technology

LMF Session 3: Surface Texturing

Tuesday, October 16 | 8:30am
Session Chair: Beat Neuenschwander, Bern Univ. of Applied Sciences, Bern, Switzerland

A Simple Way to Achieve Superhydrophobic Surfaces with Tunable Water Adhesion by a Nanosecond Pulse Laser (M301)
Zhongli Qin, Jianguo Liu, Huazhong Univ. of Science and Technology

Black Metal Absorbers Fabricated by Low-Cost Nanosecond Lasers for High Efficient Photothermal Conversion and Desalination (M302)
Jiangyou Long, Guangdong Univ. of Technology

A Novel Laser Surface Patterning Process for Fabrication of Transparent Conducting Ultra-thin Metal Film (M303)
Hongtao Ding, Qinghua Wang, Baojia Li, Fatima Toor, Univ. of Iowa

Program Committee

Jeff Allison, Abbott, Plymouth, MN, USA
Neil Ball, Directed Light Inc., San Jose, CA, USA
Yves Bellouard, Ecole Polytechnique Fédérale de Lausanne, Neuchâtel, Switzerland
Jiyeon Choi, Korea Inst. of Machinery and Materials, Daejeon, Korea
Corey Dunsky, Aeos Consulting, Inc., Los Gatos, CA, USA
Jack Gabzdyl, SPI Lasers, Southampton, Great Britain
Bo Gu, BOS Photonics, North Andover, MA, USA
Aravinda Kar, CREOL, The College of Optics and Photonics, Univ. of Central Florida, Orlando, FL, USA
Andrés Fabián Lasagni, Technische Universität Dresden, Fraunhofer IWS, Dresden, Germany
John Lopez, Univ. of Bordeaux, Bordeaux, France
Alexander Olowinsky, Fraunhofer ILT, Aachen, Germany
Michael Schmidt, Bayerisches Laserzentrum GmbH, Erlangen, Germany
Cather Simpson, Univ. of Auckland, Auckland, New Zealand

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Towards Application of Hierarchical Structures by ultra-short pulsed Laser Ablation (M304)
Norbert Ackerl, Paul Boerner, Konrad Wegener, ETH Zurich

A Modified Ablation Threshold for Two-Dimensional Surface Treatment of Silicon with a Picosecond Laser (M305)
Michael Seiler, Ernst-Abbe-Univ. of Applied Sciences Jena

The Influence of Melt on Structure Quality in a 2-Beam Interference Structuring Process by Using Ultrafast Laser (M306)
Ludwig Pongratz, Fraunhofer Inst. for Laser Technology ILT

A Novel Pump-Probe Microscope for Measuring the Dynamics of Plasma and Surface Structuring by Femtosecond Lasers (M307)
Jie Qiao, Hainian Han, Yizuo Chen, Rochester Inst. of Technology

Laser Surface Texturing with Shifted Method – Functional Surfaces at High Speed (M308)
Jiri Martan, Denys Moskal, Martin Kučera, Univ. of West Bohemia

Nanosecond Laser Pulse Surface Texturing for Generation of Superhydrophobic Surfaces: Impact of Laser and External Process Parameters (M309)
Juan Pedero Godoy Vilar, Wojciech Gora, TianLong See, Jonathan Shephard, Mohammad Antar, Duncan Hand, The Manufacturing Technology Centre (MTC)/Heriot-Watt Univ.

LMF Session 4: Advanced High Power Microprocessing

Tuesday, October 16 | 8:30am
Session Chair: Eric Mottay, Amplitude Systemes, Pessac, France

kW-Class Thin-Disk Multipass Amplifier Delivering Sub-300fs Pulses at a Repetition Rate of 1 Mhz for High-Throughput Laser-Based Material Processing (M401)
Christoph Roecker, André Loescher, Jan-Philipp Negel, IFSW Univ. of Stuttgart; Martin Delaigue, Franck Morin, Clemens Hönninger, Eric Mottay, Amplitude Systemes; Philippe Villeval, Cristal Laser

Influence of the Burst Mode onto the Specific Removal Rate for Metals and Semiconductors (M402)
Beat Neuenschwander, Bern Univ. of Applied Sciences

High Energy Fiber-Solid Hybrid Picosecond Laser Regenerative Amplifier (M403)
Tingting Wang, Pingxue Li, Kun Xiao, Inst. of Laser Engineering,Beijing Univ. of Technology

100 W Picosecond Pulse Polarization-maintaining All-fiber Amplifier (M404)
Ning Su, Pingxue Li, Inst. of Laser Engineering and Optical Engineering, Beijing Univ. of Technology

Focus Shift due to Thermal Lensing in Ultrafast Laser Optics at Kilowatt-Level Average Powers (M405)
Rudolf Weber, Meiko Boley, Daniel Förster, Sebastian Faas, Univ. of Stuttgart

500W Class Femtosecond Lasers and Beam Shaping for High Throughput Micro-processing (M406)
Eric Mottay, Martin Delaigue, Gilles Dalla-Barba, Benoit Tropheme, Konstantin Mishchik, Eric Audouard, Clemens Hoenninger, Amplitude Systemes

Investigation of Heat Accumulation Effects during Percussion Drilling by High Power Ultrashort Laser Radiation (M407)
Dennis Haasler, Chair for Laser Technology LLT, RWTH Aachen Univ.; Johannes Finger, Fraunhofer Inst. for Laser Technology

LMF Session 6: High Speed Microprocessing

Wednesday, October 17 | 9:00am
Session Chair: Robert Braunschweig, LASEA Inc., El Cajon, CA, USA

Optimization of the Micromachining Process by the Simulation of Ultrafast Laser Ablated Profiles on Metals for Different Applications (M601)
Christopher Reed, Liliana Cangueiro, Lasea S.A.; Paul-Etienne Martin, Lasea France; Jose Ramos de Campos, Axel Kupisiewicz, Lasea S.A; Robert Braunschweig, Lasea Inc.

Predicting Ablation-Cooled Gigahertz Ultrafast Laser Processing via Integrated Modeling (M602)
Jie Qiao, Rochester Inst. of Technology

High Efficiency Femtosecond Laser Ablation with Ghz Level Bursts (M603)
Eric Mottay, Konstantin Mishchik, Eric Audouard, Clemens Hoenninger, Amplitude Systemes; John Lopez, Inka Manek-Hönninger, Univ. of Bordeaux

LMF Session 7: Hard and Dielectric Material Processing

Wednesday, October 17 | 10:10am
Session Chair: Sanghoon Ahn, Korean Inst. of Technology and Materials, Seoul, Korea

High Speed Glass Cutting at Oblique Angles (M701)
Tony Lee, Coherent, Inc.

Ultra-Short Pulse Laser Machining of Ultra-Hard Compounds (M703)
Melik Hajri, Inspire AG, ETH Zürich

Experimental and Theoretical Investigation of Ultra-Short Pulsed Laser Ablation of Diamond (M704)
Paul Boerner, Swiss Federal Inst. of Technology; Melik Hajri, inspire AG; Norbert Ackerl, Konrag Wegener, Swiss Federal Inst. of Technology

LMF Session 5: Special Session Advanced Laser Technologies for Microelectronics and IC Fabrication

Wednesday, October 17 | 10:10am
Session Chair: Islam Salama, Intel Corporation, Scottsdale, AZ, USA

LASER MICROPROCESSING CONFERENCE

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Femtosecond Laser Trimming for OLED Panel Repair (M501)
Sanghoon Ahn, JiHyun Kim, Dongkeun Lee, Jiyeon Choi, Jiwhan Noh, Korea Institute of Machinery and Materials

Characterization and Control of Laser-induced Modification inside Silicon (M502)
Xinya Wang, Xiaoming Yu, University of Central Florida; Hongyu Shi, Kansas State University; Xianhua Tian, China University of Mining and Technology; Maxime Chambonneau, David Grojo, Aix-Marseille University; Brett DePaola, Shuting Lei, Kansas State University

Laser Processes Enable Advanced Mobile Device (M503)
Dirk Müller, Rainer Pätzel, Coherent Inc.

Laser-based Micro Fabrication Systems for Electronics Packaging (M504)
Haibin Zhang, Electro Scientific Industries, Inc.

Laser Processing of Glass: Considerations for Integration onto a Factory Floor (M505)
Todd Lizotte, Joseph Dagher, Orest Ohar, BOLD Laser Automation, Inc.

A Novel Laser-Based Metasurface Fabrication Process for Transparent Conducting Surfaces (0206_0301_000029)
Qinghua Wang, Baojia Li, Fatima Toor, Hongtao Ding, University of Iowa

A Novel Pump-Probe Microscope for Measuring the Dynamics of Plasma and Surface Structuring by Femtosecond Lasers (0206_0301_000177)
Tao Feng, Hainian Han, Yizuo Chen, Jie Qiao, Rochester Institute of Technology

High Power UV Lasers in PCB and Microelectronics Manufacturing (0206_0301_000185)
Rajesh Patel, Jim Bovatsek, Terence Hollister, Spectra Physics, MKS Instruments Inc.

Laser Electrospray Printing of Nanoparticles on Flexible Substrate (0206_0301_000201)
Eduardo Castillo, University of Central Florida; Ranganathan Kumar, University of Central Florida; Aravinda Kar, CREOL - University of Central Florida

Characterization and Control of Laser Induced Modification inside Silicon (0206_0301_000222)
Xinya Wang, Xiaoming Yu, University of Central Florida; Hongyu Shi, Kansas State University; Xianhua Tian, China University of Mining and Technology; Maxime Chambonneau, David Grojo, Aix-Marseille University; Brett DePaola, Shuting Lei, Kansas State University

Beam Shaping Optics and Features of its Use in Microprocessing (0206_0301_000233)
Alexander Laskin, AdlOptica GmbH

LMF Session 8: Beam Shaping

Wednesday, October 17 | 3:00pm
Session Chair: Ilya Mingareev, Univ. of Central Florida; CREOL, The College of Optics and Photonics, Orlando, FL, USA

Beam Shaping Optics and Features of its use in Microprocessing (M801)
Alexander Laskin, AdlOptica

Combined Galvanometer Scanners and Motion Platforms over Standard Industrial Networks (M802)
Clifford Jolliffe, Physik Instrumente; Holger Schlüter, Scanlab; Zeev Kirshenboim, ACS Motion Control

3D Micro and Nanoscale Structuring using Engineered Ultrafast Laser Beams for Photonic Applications (M803)
Rasvan Stoian, Cyril Mauclair, Ciro D'Amico, Manoj Bhuyan, Guodong Zhang, Guanghua Cheng, Laboratoire Hubert Curien

New Beam Deflection Technologies for Ultra Short Pulse Lasers (M804)
Dale Sabo, Scanlab America; Holger Schlüter, SCANLAB

Bessel Beams Generated by a Segmented Deformable Mirror for Laser Material Processing (M805)
Xiaoming Yu, Ankesh Todi, Hongmei Tang, Univ. of Central Florida

LMF Session 9: Biomedical Applications

Thursday, October 18 | 8:30am
Session Chair: Lucian Hand, Altos Photonics, Bozeman, MT, USA

Antibacterial Properties of Microscale Surface Topographies Generated by Ultrafast Laser Processing (M901)
Rainer Kling, Laura Gemini, Fotis Fraggelakis, Girolamo Mincuzzi, Marc Faucon, ALPhANOV

Circular Microchannels inside Bulk PMMA generated by Femtosecond Laser using Slit Beam Shaping (M905)
Gian-Luca Roth, Univ. of Applied Sciences; Cemal Esen, Ruhr Univ.; Ralf Hellmann, Univ. of Applied Sciences

LMF Session 10: Micro-joining

Thursday, October 26 | 10:40am
Session Chair: Jeff Allison, Abbott, Plymouth, MA, USA

Picosecond Laser Welding of Glass with Large Gap (M1001)
Hang Chen, Jun Duan, Xiaoyan Zeng, Huazhong Univ. of Science and Technology

Application of Fibre Lasers in Micro Joining of SS304L (M1002)
Julio Coroado, Supriyo Ganguly, Wojciech Suder, Stewart Williams, Sonia Meco, Goncalo Pardal, Cranfield Univ.

Micro Keyhole Welding with High Brightness Fiber Lasers (M1004)
Brian Baird, Anthony Hoult, IPG Photonics Corporation

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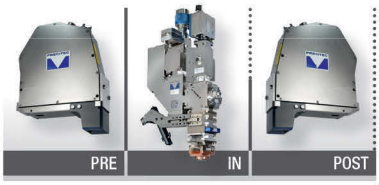
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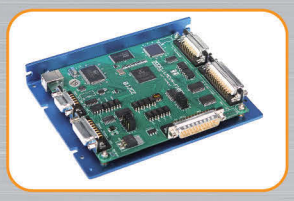


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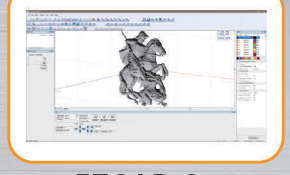
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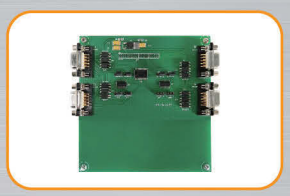

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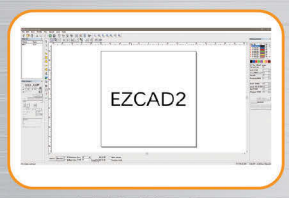

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Conference Chair: Yongfeng Lu, Univ. of Nebraska–Lincoln, Lincoln, NE USA

The Nanomanufacturing Conference will consist of presentations on nanomanufacturing which have relevance to laser technologies. Much progress has been achieved in laser direct writing for nanomachining, nanofabrication using femtosecond lasers and laser assisted growth of nanostructures. This conference will highlight research in emerging nanomanufacturing technologies in 3D micro/nanomachining, 2-photon lithography, digital fabrication, nanoparticle formation, surface nanostructuring and laser assisted growth and epitaxy.

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Nano Session 1: Nano Sensing and Characterization

Monday, October 15 | 3:30pm
Session Chair: Yongfeng Lu, Univ. of Nebraska-Lincoln, Lincoln, Nebraska, USA

Microfluidic Chips Integrated with a 2D Metal Nanodot Array by All-Femtosecond-Laser-Processing for Highly Sensitive SERS Sensing (N101)
Koji Sugioka, RIKEN

Program Committee

Craig Arnold, Princeton Univ., Princeton, NJ, USA
Kevin Chen, Univ. of Pittsburgh, Pittsburgh, PA, USA
Nick Fang, MIT, Cambridge, MA, USA
Costas Grigoropoulos, Univ. of California–Berkeley, Berkeley, CA, USA
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Sungho Jeong, Gwangju Inst. of Science and Technology, Gwangju, South Korea
Lan Jiang, Beijing Inst. of Technology, Beijing, People's Republic of China
Yuankun Lin, Univ. of North Texas, Denton, TX, USA
Jinzhong Lu, Jiangsu Univ., Zhenjiang, China
Masoud Mahjouri-Samani, Auburn Univ., Auburn, AL, USA
Alberto Pique, US Naval Research Laboratory, Washington, D.C., USA
Wilhelm Pfleging, Karlsruhe Inst. of Technology, Karlsruhe, Germany
Tomokazu Sano, Osaka Univ., Osaka, Japan
Koji Sugioka, Riken, Wako, Saitama, Japan
Mitsuhiro Terakawa, Keio Univ., Yokohama, Japan
Xinwei Wang, Iowa State Univ., Ames, IA, USA
Wei Xiong, Huazhong Univ. of Science and Technology, Wuhan, China
Xianfan Xu, Purdue Univ., West Lafayette, IN, USA
Steven Yalisove, Univ. of Michigan, Ann Arbor, MI, USA
Yunshen Zhou, Univ. of Nebraska–Lincoln, Lincoln, NE, USA

Nano Session 2: Fs Laser Processing and Fabrications

Tuesday, October 16 | 8:30am
Session Chair: Koji Sugioka, RIKEN, Saitama, Japan; Xinwei Wang

Functional Nanostructures Inside Materials Induced by Femtosecond Laser Pulses (N201)
Yasuhiko Shimotsuma, Masahiro Shimizu, Kiyotaka Miura, Kyoto Univ.

Femtosecond Laser 3D Printing of Optofluidic Devices and Systems (N202)
Qiying Chen, Daiying Zhang, Xiaoxi Man, Liqiu Men, Memorial Univ. of Newfoundland

Laser-induced Chemical Vapor Deposition of Crystalline Graphite Thin Film (N203)
Sungho Jeong, GIST; Jong Bok Park, Korea Photonics Technology Inst.; Sungho Jeong, Gwangju Inst. of Science and Technology

Shock Peening by Ultrashort Pulsed Lasers (N204)
Xin Zhao, Clemson Univ.; Yalin Dong, Chang Ye, The Univ. of Akron

Laser-Induced Three-Dimensional Assembly of Functional Nanomaterials (N205)
Wei Xiong , Huazhong Univ. of Science and Technology, Wuhan National Laboratory for Optoelectronics; Ying Liu, Univ. of Nebraska-Lincoln; Jing Long, Huazhong Univ. of Science and Technology, Wuhan National Laboratory for Optoelectronics; Yongfeng Lu, Univ. of Nebraska-Lincoln

Laser-Assisted Chemical Vapor Deposition of 2D Materials (N206)
Mohammad Nurul Azam, Auburn Univ.; Masoud Mahjouri-Samani, Auburn Univ.

Nano Session 3: Laser Processing of Battery Materials I

Wednesday, October 17 | 9:00am
Session Chair: Wilhelm Pfleging, Karlsruhe Inst. of Technology, Eggenstein-Leopoldshafen, Germany

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Integrated Anode with Si/Cu Porous Architecture for Lithium-ion Batteries (N301)
Ting Huang, Beijing Univ. of Technology

Ultrashort Pulsed Laser Ablation for Decollation of Solid State Lithium Ion Batteries (N302)
Ludwig Pongratz, Christian Hoerdemann, Arnold Gillner, Fraunhofer-Inst. for Laser Technology ILT

Development of Laser Structured Silicon/Graphite Anodes for Lithium Ion Batteries (N303)
Yijing Zheng, Peter Smyrek, Karlsruhe Inst. of Technology; Xiaopeng Cheng, Yuefei Zhang, Beijing Univ. of Technology; Hans Jürgen Seifert, Wilhelm Pfleging, Karlsruhe Inst. of Technology

Nano Session 4: Laser Processing of Battery Materials II

Wednesday, October 17 | 10:50am
Session Chair: Ting Huang, BJUT

Ultrafast Laser Inducing Nanostructures for Efficient Hydrogen Generation via Catalysis Water Splitting (N401)
Minlin Zhong, Mingyong Cai, Tsinghua Univ.

Laser Structuring of Anode Materials for Lithium Ion Batteries (N402)
Jan Bernd Habedank, Michael Zaeh, Technical Univ. of Munich

Laser-Based Micro-Manufacturing (N403)
Benxin Wu, Purdue Univ.

Electrochemical Performance of Laser-processed Cathode Materials (N404)
Wilhelm Pfleging, Jan-Hendric Rakebrandt, Yijing Zheng, Peter Smyrek, Karlsruhe Inst. of Technology

Nano Session 5: Synthesis and Diagnostics of 2D Materials

Wednesday, October 17 | 3:00pm
Session Chair: Masoud Mahjouri-Samani

In situ Diagnostics of 2D Materials Synthesis and Heterogeneity: Closing the Loop (N501)
David Geohegan, Oak Ridge National Laboratory

Seeing the "Breathing" of Layered Materials Systems (N502)
Shengzi Huang, The Pennsylvania State Univ.

Nanosecond and Picosecond Energy Transport State-Resolved Raman for Probing Conjugated Phonon and Hot Carrier Transport in 2D Materials (N503)
Xinwei Wang, Iowa State Univ.

Nano Session 6: Fs Laser Nanostructuring

Thursday, October 18 | 8:30am
Session Chair: Wei Xiong

Nano and Microscale Light-based 3D Bioprinting: An Enabling Technology for Regenerative Medicine (N601)
Jianrong Qiu, UC San Diego

Femtosecond Laser Bionic Micro/nanofabrication (N602)
Feng Chen, Xi'an Jiaotong Univ.

Femtosecond Laser-induced Anisotropic Modifications (N603)
Jingyu Zhang, Wuhan National Laboratory for Optoelectronics

Nano Session 7: Advanced Approaches in Nanoscience and Engineering

Thursday, October 18 | 10:40am
Session Chair: Minlin Zhong

Semiconductor Microspherical Crystal Whispering Gallery Mode Lasers (N701)
Daisuke Nakamura , Yuichiro Wakiyama, Hiroki Oshima, Mitsuhiro Higashihata, Hiroshi Ikenoue, Kyushu Univ.; Nilesh Vasa, Ramachandra Rao, Indian Inst. of Technology Madras

Laser-Based Approaches in Synthesis and Processing of 2D Materials (N702)
Masoud Mahjouri-Samani, Muhammad Nurul Azam, Baha Yakupoglu, Auburn Univ.

Laser Nanojoining of Copper Nanowires (N703)
Yangbao Deng , Yanfeng Bai, Hunan Univ.; Yongchao Yu, Univ. of Tennessee; Shuguang Deng, Ye Tian, Guangfu Zhang, Hunan City Univ.; Anming Hu, Univ. of Tennessee

Conference Registration

Registration may be completed online at *lia.org/conferences/icaleo/registration-information,* or by downloading and mailing/faxing a PDF registration form. **Full Conference, One-Day and Two-Day registrations include the ICALEO 2018 Proceedings.**

Full Conference Registration

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Cooperating Society	$1059	Not available for Cooperating Society, Student or Retired LIA Member
Student*	$695	
*Full-time students only. Valid student ID is required to process registration. Student registration will not be accepted on-site; students must be pre-registered by September 5.		
Retired LIA Member	$799	

One-Day Conference Registration

Registration includes admission to Technical Sessions and Receptions on specific registration date only.

Membership	August 7 – September 5	September 6 – On-site**
Member	$519	$559
Non-Member	$599	$639

Two-Day Conference Registration

Registration includes admission to Technical Sessions and Receptions on specific registration dates only.

Membership	August 7 – September 5	September 6 – On-site**
Member	$869	$939
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**Purchase orders will not be accepted for on-site registration.

On-site Registration Times

Sun., October 14 ..... 1:00pm – 4:00pm
Mon., October 15 ..... 7:00am – 5:00pm
Tue., October 16 ..... 7:30am – 4:00pm
Wed., October 17..... 7:30am – 4:00pm
Thu., October 18.....7:30am – 12:00pm

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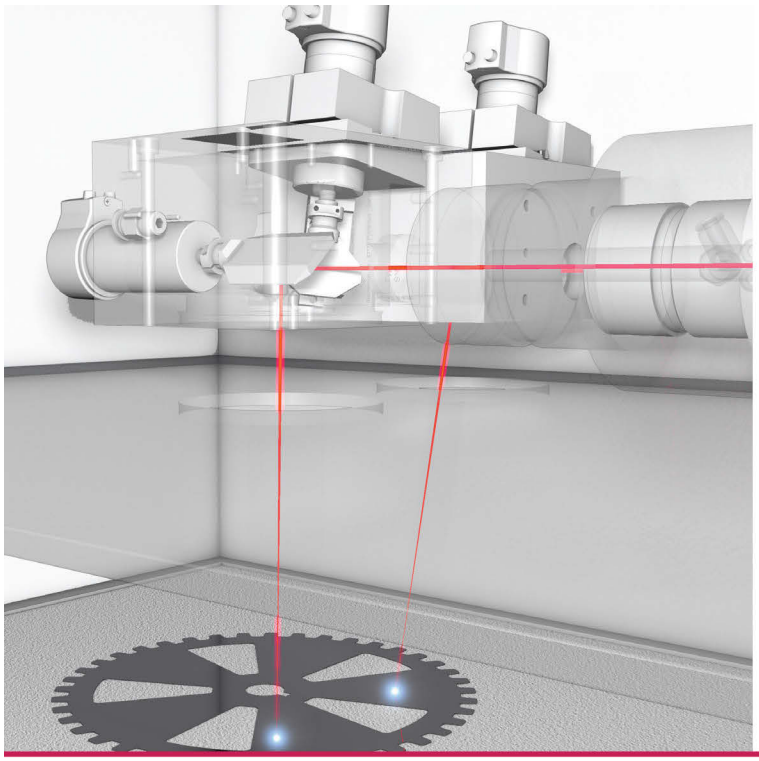
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