

Program

LaP 2022 – 5th Conference on Laser Polishing

October 12–13, 2022 | Digital Event



Welcome to the 5th Conference on Laser Polishing – LaP 2022

Scope of the Conference

The scientific community of laser polishing is constantly growing. New developments open up new applications fostering new projects. The first four Conferences on Laser Polishing LaP were a great success and reflect the interest the scientific and industrial communities have in this new advanced manufacturing technology. The conferences were attended by more than 70 participants from various industrial and scientific sectors. There is clearly a significant demand for a cost-effective, automated finishing process as a viable alternative to conventional abrasive methods.

To continue this successful exchange, the 5th Conference on Laser Polishing LaP 2022 will be held from October 12 to 13, again as a virtual conference. We aim to present scientific and application-related results on laser polishing, to bring together the people working all over the world on laser polishing, and to promote and stimulate discussions and new scientific cooperation.

The conference language is English.

Main Topics

- **Laser polishing of metals**
(e. g. functional surfaces, mechanical properties, additive manufactured parts)
- **Laser polishing of glass and laser-based processes for manufacturing optical surfaces**
- **Laser polishing of other materials**
such as plastics, ceramics and silicon
- **Laser deburring**
- **Further related topics**
(e. g. metrology and process control)

We are looking forward to meeting you at the 5th Conference on Laser Polishing LaP 2022.

Sincerely,

A handwritten signature in black ink, appearing to read 'Willenborg', written over a light blue rectangular background.

Dr. Edgar Willenborg
Fraunhofer Institute for Laser Technology ILT



LaP 2022 – Information

Virtual Conference

Due to the unpredictable situation with COVID-19 the LaP 2022 conference will be held as a virtual conference. Hopefully in 2024 we can have a personal meeting again.

Schedule

The conference will take place on Wednesday 12 and Thursday 13 October from 13:00 to 17:00 (MEST). This allows colleagues from America (in the morning) and Asia (in the evening) to participate in the conference.

Registration

Please register before September 26, 2022.
The conference fee is 200,- Euro payable on invoice by attendees as well as speakers.
The online registration form can be found at: <http://www.ilt.fraunhofer.de/lap-2022>



LaP 2022 – Program

Day 1, Wednesday, October 12, 2022

- 13:00 (MEST) Welcome and Introduction**
Dr. Edgar Willenborg, Fraunhofer Institute for Laser Technology ILT, Germany
- 13:05 Combination of innovative glass processing methods for complex component geometries**
Thomas Schmidt¹, Anett Jahn², Stefan Fricke¹, Daniel Conrad¹, Oliver Seidel², Susanne Kasch¹
¹ Günter-Köhler-Institut für Fügetechnik und Werkstoffprüfung GmbH, Jena, Germany
² ShapeFab GmbH & Co. KG, Jena, Germany
- 13:30 Process control and tool path planning in laser polishing of optics**
Manuel Jung, Tobias Brunner, Fraunhofer Institute for Laser Technology ILT, Germany
- 13:55 Simultaneous figuring and polishing of glass using femtosecond lasers**
Dr. Gong Chen, Dr. Jie Qiao, Chester F. Carlson
Center for Imaging Science, Rochester Institute of Technology, New York, USA
- 14:20 Precision form correction of laser polished fused silica surfaces by laser beam figuring**
Emrah Uluz, Fraunhofer Institute for Laser Technology ILT, Germany
- 14:45 30 Min Break**
- 15:15 Studies on the removal of scratches introduced in a defined form on fused silica surfaces**
Dr. Kerstin Götze, Prof. Jens Bliedtner, Theresa Kalinowski, Marcel Binder, University of Applied Sciences Jena, Germany
- 15:40 Laser recovery of subsurface damage in structured surfaces of single-crystal silicon**
Prof. Jiwang Yan, Department of Mechanical Engineering, Faculty of Science and Technology, Keio University, Japan
- 16:05 The effect of the infrared laser pre-heating on ultraviolet picosecond laser polishing of SiC ceramics**
Dr. Bawei Luo, Yongquan Zhou, Mingjun Liua, Prof. Haibing Xiaoa, Prof. Wei Zhang
School of Intelligent Manufacturing and Equipment, Shenzhen Institute of Information Technology, China
- 16:30 Processing strategies for laser polishing of polymer parts**
Karsten Braun, Fraunhofer Institute for Laser Technology ILT, Germany
- 16:55 Summary of day 1**, Dr. Edgar Willenborg, Fraunhofer Institute for Laser Technology ILT, Germany
- 17:00 End of day 1**

LaP 2022 – Program

Day 2, Thursday, October 13, 2022

- 13:00 (MEST) Welcome back and Introduction**
Dr. Edgar Willenborg, Fraunhofer Institute for Laser Technology ILT, Germany
- 13:05 Laser polishing of additive manufactured γ -TiAl surfaces produced by electron beam melting**
Dr. Safak Nesli¹, Prof. Oguzhan Yilmaz², Levent Subasi³, Aydemir Gunaydin³, Dr. Guney Mert Bilgin³, Dr. Akin Orhangul³, Guray Akbulut³, Kubilay Yildirim⁴, Hakan Demir⁴
¹ Advanced Manufacturing Technologies Research Group (AMTRG), Ostim Technical University, Ankara, Turkey
² Advanced Manufacturing Technologies Research Group (AMTRG), Gazi University, Ankara, Turkey
³ TUSAS Engine Industries Inc., Eskisehir, Turkey
⁴ IPG Photonics Eurasia, Tuzla, Istanbul, Turkey
- 13:30 Conduction vs. keyhole mode laser polishing of additively manufactured surfaces**
Dr. Brodan Richter¹, Kevin Klingbeil², Dr. Tim Radel³, Prof. Frank E. Pfefferkorn¹
¹ University of Wisconsin-Madison, Madison, WI, USA
² Cross Product Solutions LLC, Osceola, WI, USA
³ BIAS – Bremer Institut für angewandte Strahltechnik GmbH, Bremen, Germany
- 13:55 Reducing waviness of laser polished AM parts via de-structuring by laser remelting**
Laura Kreinest, Moritz Küpper, Fraunhofer Institute for Laser Technology ILT, Germany
- 14:20 Effect of laser polishing on SLM-Inconel 718 fatigue property**
Yimeng Wang¹, Jikui Zhang², Prof. Yingchun Guan^{1,2,3}
¹ School of Mechanical Engineering and Automation, Beihang University, Beijing, China
² Nat. Eng. Lab. of Additive Manufacturing for Large Metallic Components, Beihang University, Beijing, China
³ International Research Institute for Multidisciplinary Science, Beihang University, Beijing, China
- 14:45 30 Min Break**
- 15:15 Laser deburring of sheet metal parts for enhanced mechanical properties**
Dongsong Li¹, Stefanie Linnenbrink², Dr. Judith Kumstel²
¹ Steel Institute IEHK, RWTH Aachen University, Germany
² Fraunhofer Institute for Laser Technology ILT, Aachen, Germany
- 15:40 Recent developments of feed-forward, recurrent, and convolutional neural networks for modelling, evaluation, and prediction of the surface quality of the laser polished parts**
Prof. Evgueni V. Bordatchev^{1,2}, Wu H.², Srdjan J. Cvijanovic SJ^{2,1}, Jack Beyfuss^{1,2}, Prof. Remus O. Tutunea-Fatan², Sven Linden³, Dr. Edgar Willenborg³, Laura Kreinest³
¹ National Research Council of Canada, London, ON, Canada
² Western University, London, ON, Canada
³ Fraunhofer Institute for Laser Technology ILT, Aachen, Germany
- 16:05 Thermo-dynamic instabilities during laser polishing and their on-line thermal emission monitoring**
Jack Beyfuss^{1,2}, Wu H¹, Prof. Evgueni V. Bordatchev^{1,2}, Prof. Remus O., Tutunea-Fatan^{1,2}
¹ Western University, London, Ontario, Canada
² National Research Council of Canada, London, ON, Canada
- 16:30 Observing melt pool dynamics during laser polishing of surface features using in-situ high-speed X-ray imaging**
Patrick J. Faue¹, Brodan Richter¹, Hemant Agiwal¹, Marius Moeller², Lewin Rathmann², Kevin Klingbeil³, Samuel J. Clark⁴, Kamel Fezza⁴, Dr. Tim Radel², Prof. Frank E. Pfefferkorn¹
¹ University of Wisconsin-Madison, Madison, WI, USA
² BIAS - Bremer Institut für angewandte Strahltechnik GmbH, Bremen, Germany
³ Cross Product Solutions LLC, Osceola, WI, USA
⁴ Advanced Photon Source, Argonne National Laboratory, Lemont, IL, USA
- 16:55 Summary of LaP 2022**, Dr. Edgar Willenborg, Fraunhofer ILT, Aachen, Germany
- 17:00 End of conference**

Fraunhofer Institute for Laser Technology ILT

The Fraunhofer Institute for Laser Technology ILT is one of the most important development and contract research institutes in laser development and application worldwide. Its activities encompass a wide range of areas such as developing new laser beam sources and components, laser-based metrology, testing technology and industrial laser processes. This includes laser cutting, ablation, drilling, welding and soldering as well as surface treatment, micro processing and additive manufacturing. Furthermore, Fraunhofer ILT develops photonic components and beam sources for quantum technology.

Overall, Fraunhofer ILT is active in the fields of laser plant technology, digitalization, process monitoring and control, simulation and modeling, AI in laser technology and in the entire system technology. We offer feasibility studies, process qualification and laser integration in customized manufacturing lines. The institute focuses on research and development for industrial and societal challenges in the areas of health, safety, communication, production, mobility, energy and environment. Fraunhofer ILT is integrated into the Fraunhofer Gesellschaft.

Organization

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