

FRAUNHOFER INSTITUTE FOR LASER TECHNOLOGY ILT

VIRTUAL CONFERENCE

**LaP 2020**  
**4<sup>TH</sup> CONFERENCE ON LASER POLISHING**  
SEPTEMBER 16–17, 2020



# WELCOME



## 4<sup>TH</sup> CONFERENCE ON LASER POLISHING – LaP 2020

### Scope of the Conference

The scientific community of laser polishing is constantly growing. New developments open up new applications fostering new projects. The first three 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 4<sup>th</sup> Conference on Laser Polishing LaP 2020 will be held from September 16 to 17, this time 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 and design surfaces, additive manufactured parts, dies, tools)
- Laser polishing of glass and laser-based processes for manufacturing optical surfaces
- Machines and CAM-NC for laser polishing of metals

We are looking forward to virtually meeting you at the 4<sup>th</sup> Conference on Laser Polishing LaP 2020.

Sincerely,

Dr. Edgar Willenborg  
Fraunhofer Institute for Laser Technology ILT



## 4<sup>TH</sup> CONFERENCE ON LASER POLISHING – LaP 2020

### Registration

Please register before August 31, 2020. The conference fee is 100,- Euro payable on invoice by attendees as well as speakers. The online registration form can be found at: <http://www.ilt.fraunhofer.de/lap>

### Virtual Conference

Due to the unpredictable situation with COVID-19 the LaP 2020 conference will be held as a virtual conference. Hopefully in 2022 we can have a personal meeting again.

### Schedule

The conference will take place on Wednesday 16 and Thursday 17 September from 13:30 to 16:45 (MEST). This allows colleagues from America (in the morning) and Asia (in the evening) to participate in the conference.

### Scientific Committee

- Dr. Evgueni V. Bordatchev, Ph.D.  
National Research Council Canada
- Prof. Frank E. Pfefferkorn, Ph.D.  
University of Wisconsin-Madison
- Prof. Johannes Henrich Schleifenbaum  
RWTH Aachen University, Chair DAP
- Dr. Edgar Willenborg  
Fraunhofer Institute for Laser Technology ILT





# PROGRAM

## SEPT 16, 2020



**1<sup>ST</sup> DAY, WEDNESDAY, SEPTEMBER 16, 2020**

**13:30**  
**(MEST)** **WELCOME AND INTRODUCTION**  
Edgar Willenborg

**13:40** **MECHANISMS FOR SURFACE STRUCTURE FORMATION DURING LASER MELTING OF METALS**  
André Temmler<sup>1,3</sup>, Norbert Pirch<sup>2</sup>, Fabian Drinck<sup>2</sup>, Dameng Liu<sup>1</sup>, Jianbin Luo<sup>1</sup>, Reinhart Poprawe<sup>1,2,3</sup>, Johannes Henrich Schleifenbaum<sup>2,4</sup>  
1 Tsinghua University, School of Mechanical Engineering, Beijing, P.R. China  
2 Fraunhofer Institute for Laser Technology ILT, Aachen, Germany  
3 RWTH Aachen University, Chair for Laser Technology, Aachen, Germany  
4 RWTH Aachen University, Chair for Digital Additive Production, Aachen, Germany

**14:10** **5 MIN BREAK**

**14:15** **LASER POLISHING OF ULTRAPRECISION MACHINED SURFACES**  
Hemmo Tuovinen<sup>1</sup>, Juha Väyrynen<sup>2</sup>, Kari Mönkkönen<sup>2</sup>, Markku Kuittinen<sup>1</sup>  
1 Institute of Photonics, University of Eastern Finland, Joensuu, Finland  
2 North Karelia University of Applied Sciences, Joensuu, Finland

**14:45** **5 MIN BREAK**

**14:50** **HYBRID PROCESS CHAIN FOR POLISHING OF OPTICS MADE FROM GLASS**  
Christian Trum<sup>1</sup>, Manuel Jung<sup>2</sup>, Rolf Rascher<sup>1</sup>  
1 TH Deggendorf, IPH, Teisnach/Deggendorf, Germany  
2 Fraunhofer Institute for Laser Technology ILT, Aachen, Germany

**15:20** **5 MIN BREAK**

**15:25** **INFLUENCE OF TROCHOID BEAM PATH ON CONTINUOUS-WAVE LASER POLISHING OF 316L STAINLESS STEEL**  
Patrick Faue<sup>1</sup>, Brodan Richter<sup>1</sup>, Kevin Klingbeil<sup>1</sup>, Lucas-Hermann Beste<sup>2</sup>, Tim Radel<sup>2</sup>, Frank Vollertsen<sup>2</sup>, Frank Pfefferkorn<sup>1</sup>  
1 University of Wisconsin-Madison, USA  
2 Bremer Institut Für Angewandte Strahltechnik, Bremen, Germany

**15:55** **5 MIN BREAK**

**16:00** **ON-LINE HIGH-SPEED THERMOGRAPHIC MONITORING AND PRELIMINARY MACHINE LEARNING ANALYSIS OF THE LASER POLISHING PROCESS**  
Jack Beyfuss<sup>1,2</sup>, Evgueni V. Bordatchev<sup>2,1</sup>, Remus O. Tutunea-Fatan<sup>1,2</sup>  
1 Western University, London, ON, Canada  
2 National Research Council of Canada, London, ON, Canada

**16:30** **END OF DAY 1**  
Edgar Willenborg

# PROGRAM

## SEPT 17, 2020



**2<sup>ND</sup> DAY, THURSDAY, SEPTEMBER 17, 2020**

<b>13:30</b> (MEST)	<b>WELCOME BACK AND INTRODUCTION</b> Edgar Willenborg
<b>13:40</b>	<b>LASER POLISHING OF ADDITIVE MANUFACTURED METALLIC ALLOYS</b> Yingchun Guan <sup>1,2,3,4</sup> , Yuhang Li <sup>1</sup> , Huaming Wang <sup>2</sup> 1 School of Mechanical Engineering and Automation, Beihang University, Beijing, China 2 National Engineering Laboratory of Additive Manufacturing for Large Metallic Components, Beihang University, Beijing, China 3 International Research Institute for Multidisciplinary Science, Beihang University, Beijing, China 4 Hefei Innovation Research Institute of Beihang University, Anhui, China
<b>14:10</b>	<b>5 MIN BREAK</b>
<b>14:15</b>	<b>STEADY MAGNETIC FIELD ASSISTED LASER POLISHING OF TOOL STEEL USING CW LASER</b> Yongquan Zhou, Haibing Xiao, Jingcheng Jin, Bowei Luo Shenzhen Institute of Information Technology, China
<b>14:45</b>	<b>5 MIN BREAK</b>
<b>14:50</b>	<b>REDUCTION OF POROSITY IN NEAR-SURFACE LAYERS OF LPBF COMPONENTS BY LASER POLISHING</b> Lucas-Hermann Beste <sup>1</sup> , Tim Radel <sup>1</sup> , Brodan Richter <sup>2</sup> , Patrick Faue <sup>2</sup> , Frank Pfeifferkorn <sup>2</sup> , Frank Vollertsen <sup>1</sup> 1 Bremer Institut für angewandte Strahltechnik, Bremen, Germany 2 University of Wisconsin-Madison, USA
<b>15:20</b>	<b>5 MIN BREAK</b>
<b>15:25</b>	<b>LASER POLISHING OF METALLIC 3D PARTS – PROCESS, CAM-NC AND MACHINE</b> Laura Kreinest <sup>1</sup> , Sven Linden <sup>2</sup> , Edgar Willenborg <sup>2</sup> 1 RWTH Aachen University, Chair for Digital Additive Production, Aachen, Germany 2 Fraunhofer Institute for Laser Technology ILT, Aachen, Germany
<b>15:55</b>	<b>5 MIN BREAK</b>
<b>16:00</b>	<b>SURFACE STRUCTURING OF OPTICAL INSERTS BY LASER REMELTING</b> Evgueni V. Bordatchev <sup>1,3</sup> , Moritz Küpper <sup>2</sup> , Srdjan J. Cvijanovic <sup>3,1</sup> , Edgar Willenborg <sup>4</sup> , Nicolas Milliken <sup>1</sup> , André Temmler <sup>5</sup> , Remus O. Tutunea-Fatan <sup>3,1</sup> 1 National Research Council of Canada, London, ON, Canada 2 RWTH University, Chair for Laser Technology, Aachen, Germany 3 Western University, London, ON, Canada 4 Fraunhofer Institute for Laser Technology ILT, Aachen, Germany 5 Tsinghua University, Beijing, China
<b>16:30</b>	<b>CLOSING WITH SUMMARY AND OUTLOOK</b> Edgar Willenborg

## CONTACT

### **Organization**

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