Fraunhofer ILT

Fraunhofer Institute for Laser Technology ILT

April 26–27, 2023 | Program

7th UKP Workshop Ultrafast Laser Technology

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WELCOME

The 7th UKP Workshop Ultrafast Laser Technology 2023 will focus on processes and systems that can help companies exploit the full power spectrum of ultrafast laser performance capabilities that rest on wavelength choice, power-scaling, high-speed scanning, or suitable beam shaping. The presentations will provide valuable insights and know-how on how to select the right laser source or how to modify a laser beam profile in time and space to achieve optimal process conditions. In addition, experts will discuss how to push the limits of today's ultrashort pulse laser process technology.

The use of ultrafast lasers has enormous potential to enhance today's machine and product capabilities, improve quality and reduce post-processing requirements – a high potential for overall cost reduction. In addition, a large variety of parameters can be combined with different types of system and process technology to gain more flexibility in materials processing capability, speed, applications, and technical approach: available wavelengths that range from UV to NIR, pulse durations that range from femtoseconds to picoseconds, and average powers that nowadays range from a few watts to several kilowatts allow users to process virtually any material with excellent quality and high precision.

We will discuss not only opportunities but also how to exploit the full potential of ultrafast laser and process parameter combinations to obtain the desired machining results. We will also address ultrafast laser operations that often still pose a challenge specifically for non-scientific staff. And last-but-not-least, we are looking forward to our forum for discussion and questions, ideas, and challenges for ultrafast technology.

Constantin Häfner

Prof. Constantin Leon Häfner | Director of Fraunhofer ILT

7th UKP WORKSHOP – PROGRAM
DAY 1 – WEDNESDAY, APRIL 26, 2023

8:00 **Check-In**

9:00 **Welcome**
Prof. Constantin Häfner, Fraunhofer ILT, Aachen (D)

Keynote

9:15 **Hydrogen, Battery and Microelectronics – Perspectives for USP-Laser Materials Processing**
Prof. Arnold Gillner, Fraunhofer ILT, Aachen (D)

Laser Sources

10:00 **Building Blocks for Secondary Sources**
Dr. Torsten Mans, TRUMPF Laser GmbH, Schramberg (D)

10:30 **Perspectives in Laser Materials Processing with High Power and Flexible Femtosecond Lasers**
Dr. Clemens Hönninger, Amplitude Laser Group, Pessac (F)

Applications

11:00 **Advances and Prospects in Ultrafast Laser Processing**
Dr. Achim Nebel, Coherent Kaiserslautern GmbH, Kaiserslautern (D)

Applications – Energy Storage

11:30 **Laser Microstructuring in the Field of Hydrogen Technology**
Tobias Keller, Fraunhofer ILT, Aachen (D)

12:00 **Lunch Break**

13:00 **Laser Structuring of Electrodes and its Perspectives for Battery Production**
Prof. Wilhelm Pfleging, Karlsruher Institut für Technologie (KIT), Karlsruhe (D)

13:30 **Micro Structuring of Rotary Tools for Printing and Embossing Applications**
Dr. Stephan Brüning, Schepers GmbH & Co. KG, Vreden (D)

Virtual Lab Tour

14:00 **Battery Lab at Fraunhofer ILT**
Matthias Trenn, Fraunhofer ILT, Aachen (D)

14:30 **Coffee Break**

Laser Sources

15:00 **Coherent EUV Laser Sources and Applications**
Dr. Jan Rothhardt, Fraunhofer IOF, Jena (D)

Applications – Electronics

15:30 **Interference Structuring from the Basics to the Applications**
Dr. Thomas Kiedrowski, Robert Bosch GmbH, Renningen (D)

16:00 **USP 4 µLED – Ultra Short Pulse Laser Processing to Locate, Expose and Diagnose faulty µLEDs**
Dr. Michael Grimm, 3D-Micromac AG, Chemnitz (D)

16:30 **Summary of the first day**
Martin Reininghaus, Fraunhofer ILT, Aachen (D)

Evening Event

19:00 **Networking Event**
Ballroom "Altes Kurhaus", Aachen (D)
(Admission from 18:30 h)

7th UKP WORKSHOP – PROGRAM
DAY 2 – THURSDAY, APRIL 27, 2023

8:00 **Check-In**

9:00 **Welcome**
Prof. Arnold Gillner, Fraunhofer ILT, Aachen (D

Keynote

9:15 **Perspectives in USP-Laser Processing**
Dr. Gediminas Raciukaitis, EKSPLA uab, Vilnius (LT)

Applications – Glass Processing

10:00 **USP-Laser Processing of Transparent Materials for Microelectronic Components and Quantum Computing Applications**
Sebastian Simeth, Fraunhofer ILT, Aachen (D)

10:30 **TBA**
Dr. Stephan Eifel, Pulsar Photonics GmbH, Herzogenrath (D)

11:00 **3D High Precision Glass Structuring by Selective Laser-Induced Etching and Internal Glass Modification/Welding for Quantum and Photonics Technologies**
Dr. Jens Gottmann, LightFab GmbH, Aachen (D)

11:30 **Lunch Break**

Beam Shaping

12:30 **Enhancing Ultra Short Pulse Laser-based Processes with Tailored Intensity and Phase Beam Shaping using Multi-Plane Light Conversion**
Gwenn Pallier, CAILABS, Rennes (F)

13:00 **Digital Optical Technologies for USP Applications**
Prof. Carlo Holly, RWTH Aachen University – TOS, Aachen (D)

Virtual Lab Tour

13:30 **Multibeam**
Martin Osbild, Fraunhofer ILT, Aachen (D)

14:00 **Coffee Break**

Applications – Microelectronics

14:30 **Laser Material Processing for Microelectronics**
Dr. Stefan Janssen, LG Electronics PRI, Pyeongraek (KOR)

15:00 **Beam Shapes Tailored in Time and Space for Advanced Industrial Applications**
Dr. Malte Kumkar, TRUMPF Laser- und Systemtechnik GmbH, Ditzingen (D)

Applications – Basics

15:30 **Influence of the Lattice Orientation onto Ultra-Short Pulsed Laser Micromachinig of Semiconductors**
Prof. Beat Neuenschwander, Institute for Applied Laser, Photonics and Surface Technologies ALPS, Burgdorf (CH)

16:00 **Outlook**
Prof. Arnold Gillner, Fraunhofer ILT, Aachen (D)

16:15 **End**

Program subject to changes.
Lectures are presented in English and German with simultaneous interpreting.

GENERAL INFORMATION

LOCATIONS AND HOTELS

Venues

- **Workshop:** "DAS LIEBIG",
  Liebigstraße 19, 52070 Aachen, Germany,
  www.dasliebig.de
- **Networking Event:** "Ballroom Altes Kurhaus"
  Komphausbadstraße 19, 52062 Aachen, Germany,
  www.altes-kurhaus-aachen.de

Conference Language

All lectures are presented in English and German with simultaneous interpreting.

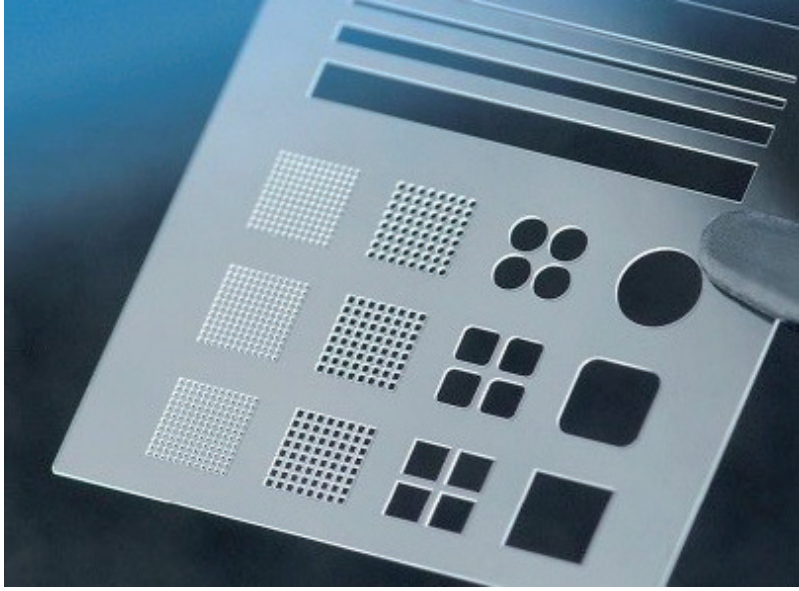
Shuttle Service

A complimentary shuttle service will be provided for workshop attendees between the hotels and the meeting site.

Hotels

A limited contingent of hotel rooms at specially negotiated rates has been reserved for the participants of the 7th UKP Workshop. We strongly suggest making your reservation early in one of the following hotels:

- Hampton by Hilton – Aachen Tivoli ***
- Motel One ***
- Aquis Grana Cityhotel ****
- Mercure Hotel am Dom ****
- Novotel Aachen City ****



CONDITIONS OF PARTICIPATION

Registration Fee

The registration fee for the 7th UKP Workshop 2023 includes workshop proceedings, lunch, light refreshments, and coffee breaks on both conference days. It also covers the complimentary shuttle service between the hotels and the meeting site "DAS LIEBIG" in Aachen.

- **€ 795** – 7th UKP Workshop (April 26-27, 2023)
- **€ 80 (plus 19 % VAT)** – Networking Event* (April 26, 2023) at "Ballroom Altes Kurhaus", Aachen

*Please note, that the workshop participation cannot be booked without the Networking Event.

GENERAL INFORMATION

CONDITIONS OF PARTICIPATION

Registration

To register please use the form provided online at www.ultrafast-laser.com. Once you have signed up, you will receive a confirmation of participation via e-mail as well as your invoice, which can be settled by bank transfer.

Registration Deadline: April 7, 2023.

At Check-In you will receive your name badge, the workshop proceedings as well as the admission ticket for the booked evening event. Please wear your badge during the whole conference and the evening event.

Cancellations

Cancellations of participation must be submitted in writing to ukp@ilt.fraunhofer.de. Those who cancel by March 16, 2023 will be reimbursed the attendance fee minus an administration charge of € 100. Cancellations after this date will incur the full attendance fee. Should this happen, you will be sent a summary of the conference proceedings. We also welcome a substitute participant. In this case please provide us the name of the substitute participant via e-mail.

For further information please visit: www.ultrafast-laser.com

FRAUNHOFER ILT

PROFILE

With over 480 employees, more than 19,500 m² net floor space and more than 40 spin-offs, the Fraunhofer Institute for Laser Technology ILT is one of the world's most important contract research and development institutes in the fields of laser development and laser applications. Our core competencies include the development of new laser beam sources and components, laser measurement and testing technology, and laser manufacturing technology. This includes cutting, ablation, drilling, welding and soldering as well as surface finishing, micro manufacturing and additive manufacturing, among others.

The areas of application for laser beam sources and processes include production and metrology, energy and mobility, medical and environmental technology, and quantum technology. Together with excellent partners from German and international research and industry, we develop, for example, satellite-based measurement systems for climate research or frequency converters for a fiber-based quantum internet. Cross-sectionally, Fraunhofer ILT addresses issues of digitalization in photonics and production technology, process monitoring and control, simulation and modeling, AI in laser technology, and the entire field of system technology.

Organization

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