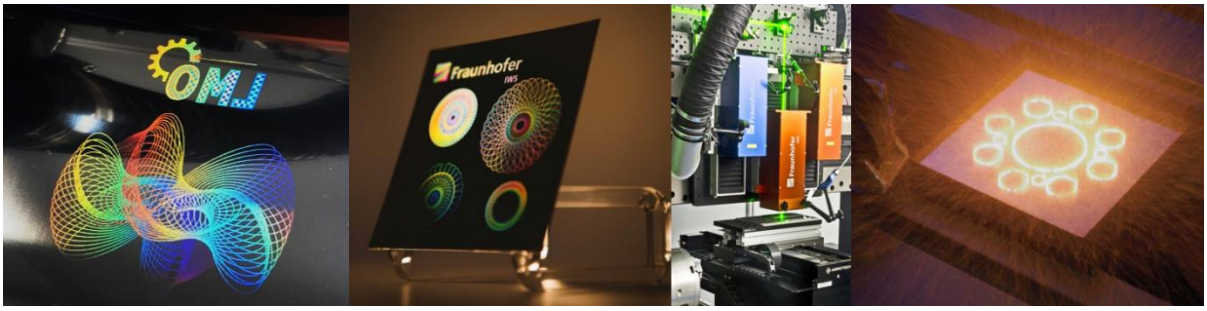
12th International Summer School on

Trends and new developments in Laser Technology

28 August – 01 September 2023

Technische Universität Dresden, Fraunhofer IWS, Dresden, Germany



Program

Monday 28/08

12:00 – 13:00	**Registration**
13:00 – 13:15	**Opening**, Prof. Andrés F. Lasagni, Technische Universität Dresden, Fraunhofer IWS, Germany.
13:15 – 14:30	Prof. Andrés F. Lasagni, "Introduction to laser processing: the laser beam, a tool for multiple applications", Technische Universität Dresden, Fraunhofer Institute for Material and Beam Technology IWS, Germany.
14:30 – 14:50	**Break**
14:50 – 16:20	Dr. Axel Jahn, "Advances on laser based joining technologies", Fraunhofer Institute for Material and Beam Technology IWS, Germany.
16:20 – 16:30	**Break**
16:30 – 18:00	**Participant presentations – Laser micro-processing**
16:30 – 16:45	Dominyka Stonyte, direct laser ablation of high-bandgap materials for multi-level diffractive optical elements using femtosecond UV laser pulses, Vilnius University, Vilnius, Lithuania.
16:45 – 17:00	Dirk Obergfell, Investigation of ablation efficiency of stainless steel using pulsed lasers in burst mode, Furtwangen University / Technische Universität Dresden, Tuttlingen, Germany.

17:00 – 17:15 Lucas Naumann, Experimental study of femtosecond laser ablation with filaments, University of Applied Science Mittweida, Mittweida, Germany.

17:15 – 17:30 Evaldas Kažukauskas, Full control of surface roughness when engraving transparent materials using femtosecond laser ablation, Vilnius University, Vilnius, Lithuania.

17:30 – 17:45 Stephan Moghtaderifard, Influence of initial surface roughness on the topography of periodic microstructures fabricated by direct laser interference patterning, Technische Universität Dresden, Dresden, Germany.

17:45 – 18:00 Jake Sanwell, Power scaling 2µm thulium thin-slab lasers, center for physical science and technology, Heriot-Watt University, Edinburgh, United Kingdom.

Tuesday 29/08

09:00 – 10:30 Marko Seifert, "Recent advances on laser based surface hardening technologies", Fraunhofer Institute for Material and Beam Technology, Germany.

10:30 – 10:50 **Break**

10:50 – 12:20 Prof. Frank Brückner, "Fabrication of 3D parts using Additive Manufacturing", Fraunhofer Institute for Material and Beam Technology, Germany.

12:20 – 13:30 **Lunch**

13:30 – 14:30 **Participant Presentations – Laser processing for materials functionalization**

13:30 – 13:45 Fabian Ränke, High-speed laser surface texturing by combining direct laser interference patterning with polygon scanner technology, Technische Universität Dresden, Dresden, Germany.

13:45 – 14:00 Lis Geraldine Zschach, Understanding the corrosion mechanism of laser-structured aluminum, Technische Universität Dresden, Dresden, Germany.

14:00 – 14:15 Mohammad Rezayat, Laser surface texturing of AISI 301LN trip steel for enhancement of the corrosion resistance at high temperature, Universitat Politècnica de Catalunya, Barcelona, Spain.

14:15 – 14:30 Hao-Tian XU, Laser-induced transformation of transparent-conductive-oxide (TCO) thin films, Université de Strasbourg, Strasboug, France.

14:30 – 14:45 **Break**

14:45 – 15:45	**Participant Presentations – Special methods in laser manufacturing**
14:45 – 15:00	Maurycy Kempa, Laser polishing of CVD diamond coatings, Wroclaw University of Science and Technology, Wroclaw, Poland.
15:00 – 15:15	Gökan Yılmaz, Robotic fiber laser welding of AISI 1075 steel, Uludağ Üniversitesi, Bursa, Turkey.
15:15 – 15:30	Vladyslav Arseniuk, How the heat treatment and cladding strategy affect the properties of tool steel clads, University of West Bohemia, Pilsen, Czech Republic.
15:30– 15:45	Jakob Benz, Process parameter development for L-PBF processing of a Ni-base superalloy laser processing, Fachhochschule Nordwestschweiz, Windisch, Switzerland.
15:45 – 16:00	**Break**
16:00 – 17:15	**Participant presentation – Process monitoring**
16:00 – 16:15	Clarita Muntschick, Listening to the surface: monitoring direct laser interference patterning utilizing solid-borne acoustic emission, Fraunhofer IWS, Dresden, Germany.
16:15 – 16:30	Ignacio Tabares, Monitoring of ns-DLIP structure formation: a time resolved reflectivity based approach, Technische Universität Dresden, Dresden, Germany.
16:30 – 16:45	Leander Kläber, Interpretable physically informed neural network for approximating the complex-valued transfer function of a multimode fiber, University of Applied Sciences Zwickau, Zwickau, Germany.
16:45 – 17:00	Marcelo Sallese, Material characterization by optical coherence tomography, Universidad Tecnológica Nacional / Technische Universität Dresden, Buenos Aires, Argentina.
17:00 – 17:15	Sadiq Gbagba, Advances in machine learning techniques used in fatigue life prediction of welded metallic structures, Free University of Bozen-Bolzano, Bolzano, Italy.
19:00 – 22:00	**Summer School Dinner (Feldschlösschen-Stammhaus)**
19:30 – 20:00	**Dinner Speech:** “The future of laser processing: how new laser sources and processes will change the laser industry”, Prof. Andrés F. Lasagni, Technische Universität Dresden, Fraunhofer IWS, Germany.

Wednesday 30/08

09:00 – 10:30	Dr. Patrick Herwig, “Think thick – laser cutting of thick sheet materials”, Fraunhofer Institute for Material and Beam Technology IWS, Germany.

10:30 – 10:50 **Break**

10:50 – 12:20 Prof. G.R.B.E. Römer, “Laser-induced Forward Transfer (LIFT) of metallic 3D micro-structures”, University of Twente, Netherlands.

12:20 – 13:30 **Lunch**

13:30 – 15:00 Sebastian Kraft, “High-throughput machining using high-average power ultrashort pulse lasers and high-speed polygon scanner”, University of Applied Science Mittweida, Germany.

15:00 – 15:30 **Break**

15:30 – 16:10 **Sponsoring Presentations**
15:30 – 15:50 Dr. Erwin Jäger, “Diffractive optics for laser material processing”, TOPAG Lasertechnik GmbH, Darmstadt. Germany
15:50 – 16:10 Dr. Florian Rößler, “Polygon mirror scanners for high speed laser processing”, Moewe Optical Solutions GmbH, Mittweida, Germany.

16:10 – 16:30 **Break**

16:30 – 17:10 **Sponsoring Presentations**
16:30 – 16:50 Dr. Bogdan Voisiat, xDLIP: Biomimetic surfaces using novel laser functionalization technique, SurFunction, Saarbrücken, Germany.
16:50 – 17:10 Ilya Tkachuk, High-efficiency microprocessing of metals, polymers, and transparent materials with femtosecond fiber laser, Fluence, Warsawa, Poland.

17:15 – 17:45 **Participant Presentations – Laser applications in Biomedicine**
17:15 – 17:30 Antje Schuschies, Augmenting image data with a Cyclic GAN, University of Applied Sciences Zwickau, Zwickau, Germany.
17:30 – 17:45 Zuzanna Jankun, Li Shen, DNBSEQTM DNA sequencing based on laser-excited fluorescence, Latvia MGI Tech, Riga, Latvia.

Thursday 31/08

09:00 – 10:30 Dr. Felix Dreisow, “Recent developments and applications of ultrashort pulse-lasers”, Schott Technical Glass Solutions GmbH, Jena, Germany.

10:30 – 10:50 **Break**

10:50 – 12:20 Dr. Achim Mahrle, “Theoretical approaches towards process design and analysis with application examples from laser material processing”, Fraunhofer Institute for Material and Beam Technology IWS, Germany.

12:20 – 13:10	**Lunch**
13:10 – 14:10	Prof. Andrés F. Lasagni, “Laser interference patterning: past, present and future for large area surface functionalization”, Technische Universität Dresden, Fraunhofer Institute for Material and Beam Technology IWS, Germany.
14:10 – 14:30	**Break**
14:30 – 15:30	Dr. Robert Baumann, “Laser Safety”, Technische Universität Dresden, Fraunhofer Institute for Material and Beam Technology IWS, Germany.
15:30 – 15:40	**Break**
15:40 – 16:40	**Lab tour at IWS**
16:40 – 16:55	Delivery of Summer School certificates

Friday 01/09

09:00 – 09:15	Organization of the lab groups
09:15 – 10:45	Laboratory 1
10:45 – 11:00	**Break**
11:00 – 12:30	Laboratory 2
12:30 – 13:30	**Lunch**
13:30 – 15:00	Laboratory 3
15:00 – 15:30	Prof. Andrés F. Lasagni, Closing Remarks