

11th International Summer School on
**Trends and new developments in
Laser Technology**

29 August – 02 September 2022

Technische Universität Dresden, Fraunhofer IWS, Dresden, Germany



Program

Monday 29/08

- 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 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 – 17:30 **Participant presentations – Laser-Micro-Processing I**
- 16:30 – 16:45 Pavels Onufrijevs, Laser processing of GeSn epilayers: formation of graded bandgap structure, Riga Technical University, Riga, Latvia.
- 16:45 – 17:00 Liga Grase, Surface modification of titanium plates using femtosecond laser for enhanced antibacterial properties, Riga Technical University, Riga, Latvia.

- 17:00 – 17:15 Saulė Steponavičiūtė, Rapid ultrashort pulse laser texturing for modification of stainless steel wettability, Center for Physical Science and Technology, Vilnius, Lithuania.
- 17:15 – 17:30 Ugnė Gudauskytė, Manufacturing of moulds by low surface roughness and efficient ultrashort pulse laser ablation, Center for Physical Science and Technology, Vilnius, Lithuania.

Tuesday 30/08

- 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 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 – 13:30 **Lunch**
- 13:30 – 14:45 **Participant Presentations – Laser-Micro-Processing II**
- 13:30 – 13:45 Lis Geraldine Zschach, Fabrication of nanosecond laser structures for enhancing corrosion resistance of Aluminium, Technische Universität Dresden, Dresden, Germany.
- 13:45 – 14:00 Katarzyna Kowalska, The power of femtoseconds: from laboratory to industrial implementations, Fluence, Warsaw, Poland.
- 14:00 – 14:15 Frederic Schell, Examining the wetting transition of laser-microtextured steel surfaces, Fraunhofer IWS, Dresden, Germany.
- 14:15 – 14:30 **Break**
- 14:30 – 14:45 Raffaele De Palo, Influence of incubation effect and repetition rate on multi-pulse fluence threshold for femtosecond-laser processing of quartz, Università degli Studi di Bari, Bari, Italy.
- 14:45 – 15:00 Martins Maria, Ultrashort pulsed laser approach to structure Ni/Al Reactive Multilayer Foil, Universität des Saarlandes, Saarbrücken, Germany.
- 15:00 – 15:15 Emma Antonia Cuello, Design and development of laser-patterned nanocomposites based on hydrogel surfaces as advanced wound dressings, Technische Universität Dresden, Dresden, Germany.

- 15:15 – 15:30 Tianhao Wu, Research on OpenFOAM-based numerical modeling and simulation of pulsed laser processing, Technische Universität Dresden, Dresden, Germany.
- 15:30 – 15:45 **Break**
- 15:45 – 16:30 **Participant presentation - Laser cutting and special methods in laser processing**
- 15:45 – 16:00 Farzaneh Kaji, In-situ defect detection and dimension correction for LDED-PF using deep-learning, University of Waterloo, Waterloo, Canada.
- 16:00 – 16:15 Natalia Grudzień, Improved ultrafast laser technique for cutting round shapes in polymers and glass using Bessel beam and temporal pulse shaping, Fluence, Warsaw, Poland.
- 16:15 – 16:30 Kardan Masoud, Thick plates fusion cutting using dynamic beam shaping, KU Leuven Research & Development (LRD), Heverlee, Belgium.
- 19:00 – 22:00 **Summer School Dinner (Carolasschlösschen)**
- 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 31/08

- 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 Periodic Surface Structures (LIPSS) - Fundamentals and applications”, University of Twente, Netherlands (online).
- 12:20 – 13:30 **Lunch**
- 13:30 – 15:00 Dr. Joerg Schille, “High-throughput machining using high-average power ultrashort pulse lasers and high-speed polygon scanner”, University of Applied Science Mittweida, Germany (Zugesagt)

- 15:00 – 15:30 **Break**
- 15:30 – 16:30 **Sponsoring Presentation**
- 15:30 – 16:00 Christian Scholz, “Laser Processing and Roll-to-Roll Machining – A Perfect Match for Flexible Device Production”, 3D-Micromac, Chemnitz. Germany (Zugesagt)
- 16:00 – 16:30 Dr. Keming Du, “Power scaling of Industrial Free Trigger Able Ultra-short Pulse UV Lasers”, Edgewave, Würselen. Germany (online)
- 16:30 – 16:45 **Break**
- 16:45 – 17:15 **Participant Presentations – Additive Manufacturing**
- 16:45 – 17:00 Simone Maffia, Sustainability improvement of laser metal deposition by achieving near-zero waste highly productive process conditions, Politecnico di Milano, Milan, Italy.
- 17:00 – 17:15 Francesco Galbusera, Spatial in-source dynamic beam shaping in Laser Powder Bed Fusion to enhance the processability of e-mobility alloys, Politecnico di Milano, Milan, Italy.

Thursday 01/09

- 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 Prof. Frank Brückner, “Fabrication of 3D parts using Additive Manufacturing“, Fraunhofer Institute for Material and Beam Technology, Germany.
- 12:20 – 13:00 **Lunch**
- 13:00 – 14:00 Prof. Andrés F. Lasagni, “Laser interference patterning: past, present and future for large area surface functionalization“, Technische Universität Dresden, Fraunhofer IWS, Germany.
- 14:00 – 14:20 **Break**
- 14:20 – 15:20 Dr. Robert Baumann, “Laser Safety“, Technische Universität Dresden, Fraunhofer IWS, Germany.

15:20 – 15:30 **Break**

15:30 – 16:30 **Lab tour at IWS**

16:30 – 16:45 Delivery of Summer School certificates

Friday 02/09

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