

# SLT 2024 PROGRAM



## PLENARY SESSIONS – Overview

All Plenary Sessions take place in → ROOM 01

### TUESDAY, 04 JUNE 2024

#### PLENARY SESSION “QUANTUM TECHNOLOGY”

09:00	SLT 2024 OPENING AND INFORMATION Heidi-Maria Götz IFSW, University of Stuttgart, Germany	09:30	MINIATURIZATION AND INDUSTRIALIZATION OF QUANTUM SENSORS Jens Anders, Institute of Smart Sensors, University of Stuttgart, Germany
09:15	WELCOME TO THE SLT 2024 Thomas Graf, Andreas Michalowski IFSW, University of Stuttgart, Germany	10:15	PHOTONIC QUANTUM TECHNOLOGIES Michael Förtsch, Q.ANT GmbH, Stuttgart, Germany
11:00	COFFEE BREAK ☕		

### WEDNESDAY, 05 JUNE 2024

#### PLENARY SESSION “LASER SOURCES”

08:45	SLT 2024 OPENING AND INFORMATION Heidi-Maria Götz IFSW, University of Stuttgart, Germany	09:00	HIGHLY STABILIZED LASERS FOR THE SEARCH FOR GRAVITATIONAL WAVES AND DARK MATTER Benno Willke, Max Planck Institute for Gravitational Physics and Leibniz University Hannover, Germany
		09:45	HIGH POWER LASER PROCESSING WITH KILOWATT FEMTOSECOND LASERS Eric Mottay, Amplitude, Pessac, France and H-Nu, Bordeaux, France
10:30	COFFEE BREAK ☕		

### THURSDAY, 06 JUNE 2024

#### PLENARY SESSION “ARTIFICIAL INTELLIGENCE IN PRODUCTION”

08:45	SLT 2024 OPENING AND INFORMATION Heidi-Maria Götz IFSW, University of Stuttgart, Germany	09:00	INTELLIGENT LIGHT: THE FUSION OF AI AND LASERS Ben Mills, Optoelectronics Research Centre, University of Southampton, United Kingdom
		09:45	INDUSTRIAL AI AT BOSCH Christian Daniel, Robert Bosch GmbH, Renningen, Germany
10:30	COFFEE BREAK ☕		

**SLT Program: Tuesday, 04 June 2024****ROOM 01****SLT SESSION I → 11:30 – 13:00****SPECTRAL, TEMPORAL AND SPATIAL SHAPING OF LASER BEAMS**, Chair M. Abdou Ahmed

- 11:30 Making Ultrashort Pulses Shorter with Multipass Cells  
O. Pronin, Helmut Schmidt University, Hamburg, Germany
- 12:00 Spectral Beam Shaping for Dual-Wavelength Laser Emission  
A. Boubekraoui, IFSW, University of Stuttgart, Germany
- 12:15 Innovative All-Reflective Laser Beam Shaping for Material Processing based on Microstructured Mirrors  
D. Dung, Midel Photonics GmbH, Bonn, Germany
- 12:30 Versatile Laser Platform – from Ultrafast to CW  
C. Schmittner, IFSW, University of Stuttgart, Germany

13:00 LUNCH (AT "KLEINER KURSAAL") AND EXHIBITION 🍴

**SLT SESSION II → 14:30 – 16:00****LASER PROCESSING FOR QUANTUM TECHNOLOGIES**  
Chair T. Menold

- 14:30 Femtosecond Laser Micromachining: an Enabling Tool for Quantum Technologies, R. Osellame, Institute for Photonics and Nanotechnologies, Milano, Italy
- 15:00 Ultrashort Pulse Laser Processing for Quantum Optical Applications  
S. Nolte, Institute of Applied Physics, Friedrich Schiller University Jena, Germany
- 15:30 Quantum Walks in Laser-Written Photonic Structures  
M. Gräfe, Institute of Applied Physics, Technical University of Darmstadt, Germany

16:00 COFFEE BREAK ☕

**SLT SESSION III → 16:30 – 18:00****FIBRE-OPTIC BEAM DELIVERY**  
Chair M. Abdou Ahmed

- 16:30 Development of Hollow-Core Fibers at the IFSW  
T. Kühlthau, IFSW, University of Stuttgart, Germany
- 17:00 Application of Hollow-Core Fibres for Laser Delivery and Microparticle Guidance  
V. Zuba, Optoelectronics Research Centre, University of Southampton, UK
- 17:30 Dual-Wavelength Fibers for USP Lasers  
B. Chen, IFSW, University of Stuttgart, Germany

**ROOM 03****LASER PROCESSING FOR E-MOBILITY**  
Chair P. O'Toole

- 11:30 Unlocking Opportunities for EV Industry with Beam Shaping of High-Power Laser, O. Bocksrocker, TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, Germany
- 12:00 Advancing Electric Vehicle Manufacturing: High-Precision Laser Welding Solutions with MPLC Technology  
G. Pallier, Cailabs, Rennes, France
- 12:15 Laser goes Hydrogen  
D. Dittrich, Fraunhofer Institute for Material and Beam Technology, Dresden, Germany
- 12:30 Laser Hairpin Welding across Different Wavelength and Beam Shaping Capabilities, A. Demir, Department of Mechanical Engineering, Politecnico di Milano, Milan, Italy

**DYNAMIC LASER BEAM SHAPING AND ITS APPLICATION I**, Chair C. Hagenlocher

- 14:30 Dynamic Beam Shaping with Coherent Beam Combining  
E. Shekel, Civan Lasers, Jerusalem, Israel
- 15:00 Is Laser Beam Shaping a Game Changer to Improve Weld Quality of e-Mobility Parts?  
P. Franciosa, WMG, The University of Warwick, Coventry, UK
- 15:30 Dynamic Beam Shaping in Directed Energy Deposition  
D. Bartels, Institute of Photonic Technologies, Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany

**DYNAMIC LASER BEAM SHAPING AND ITS APPLICATION II**, Chair M. Sawannia

- 16:30 Coherent Beam Combining – Novel Process Solutions for Laser Welding, D. Dittrich, Fraunhofer Institute for Material and Beam Technology, Dresden, Germany
- 17:00 Dynamic Beam Shaping "Foil" Welding  
S. Olschok, Welding and Joining Institute, RWTH Aachen University, Aachen, Germany
- 17:30 Laser Welding with Adjustable Beam Profiles  
J. Wagner, Robert Bosch GmbH, Renningen, Germany

**SOCIAL PROGRAM → 18:00 – 22:00**

- 18:00 VISIT OF THE GOTTLIEB DAIMLER MEMORIAL (optional)
- 20:00 CONFERENCE DINNER AT "KLEINER KURSAAL"

**SLT Program: Wednesday, 05 June 2024****ROOM 01****SLT SESSION IV → 11:00 – 12:30****VISIBLE AND ULTRAVIOLET LASERS**

Chair S. Esser

- 11:00 High Performance Nonlinear Frequency Conversion  
G. Mennerat, CEA – French Atomic Energy & Alternative Energies Commission, Université Paris-Saclay, Gif-sur-Yvette, France
- 11:30 High-Throughput High-Quality Processing of CFRP by High Power Nanosecond UV Pulses  
D. Horain, BLOOM Lasers, Pessac, France
- 11:45 Ultra Short Pulse Processing with Atypical Wavelengths  
P. Bliškevičius, Light Conversion, Vilnius, Lithuania
- 12:00 High Power UV Nanosecond Lasers  
C. Stolzenburg, TRUMPF Laser AG, Schramberg, Germany
- 12:30 LUNCH (AT "KLEINER KURSAAL") AND EXHIBITION ☕

**ROOM 03****ADDITIVE MANUFACTURING OF METALS**

Chair M. Henn

- 11:00 Unlocking the Full Potential of Laser Material Deposition for Coating, Repair and Additive Manufacturing, T. Schopphoven, Fraunhofer Institute for Laser Technology ILT, Aachen, Germany
- 11:30 Increased Productivity in Laser Based Post Processing of AM Parts using Combined Laser Processes, M. Hofele, LaserApplicationCenter, Aalen University of Applied Sciences, Germany
- 11:45 New Paths for Industrial Plain Bearing Manufacturing  
T. Molitor, Laserline GmbH, Mülheim-Kärlich, Germany
- 12:00 Influence of Feedstock on the Laser Powder Bed Fusion Process  
F. Zanger, wbk Institute of Production Science, Karlsruhe Institute of Technology, Karlsruhe, Germany

**SLT SESSION V → 14:00 – 15:15****NOVEL LASER CRYSTALS AND OPTICS**

Chair A. Loescher

- 14:00 First Thin-Disk Laser Operation of Alexandrite Crystal  
S. Esser, IFSW, University of Stuttgart, Germany
- 14:30 LED-Pumped Alexandrite Multipass Amplifiers  
F. Balembois, Institut d'Optique Graduate School, CNRS, Laboratoire Charles Fabry, Université Paris-Saclay, Palaiseau, France
- 15:00 Grating Waveguide Structures for the Generation of Radially Polarized Beams in Ceramic Yb:Lu<sub>2</sub>O<sub>3</sub> Thin-Disk Laser  
D. Didychenko, IFSW, University of Stuttgart, Germany
- 15:15 COFFEE BREAK ☕

**ADDITIVE MICRO- AND NANOPROCESSING**

Chair T. Menold

- 14:00 3D Printed Complex Microoptics: Fundamentals and First Benchmark Applications, H. Giessen, 4th Physics Institute and Research Center SCoPE, University of Stuttgart, Germany
- 14:30 Highly Efficient Welding of Additively Manufactured Thermoplastic Components  
L. Kroth, Evosys Laser GmbH, Erlangen, Germany
- 14:45 Two-Photon Polymerization (2PP) for Micro and Nano Additive Manufacturing, J. Zimmer, Nanoscribe GmbH & Co. KG, Eggenstein-Leopoldshafen, Germany

**SLT SESSION VI → 15:45 – 17:00****LASER PROCESS MONITORING**

Chair M. Sawannia

- 15:45 Successful Determination of the Physical Properties of a Weld Seam – how much Information is Buried in the Sensor Signals of a Laser Welding Process?  
M. Kogel-Hollacher, Precitec GmbH & Co. KG, Gaggenau, Germany
- 16:15 Influence of the Laser Plume Interaction on the Beam Profile during Deep-Penetration Welding with Coherent Beam Shaping, D. Brinkmeier, IFSW, University of Stuttgart, Germany
- 16:30 Vision-Based Process Monitoring in Additive Manufacturing  
M. Palalić, Institute for Machine Tools, University of Stuttgart, Germany
- 16:45 Advanced Fault Classification by using a Multi-Spectral Sensor  
S. Hollatz, 4D Photonics GmbH, Isernhagen, Germany
- 17:00 APÉRO 🍷

**LASER BEAM SHAPING FOR MICROMACHINING**

Chair D. Holder

- 15:45 Photonic Shaping Tools for Micro-Machining at Large Scales  
D. Flamm, TRUMPF Laser- und Systemtechnik AG, Ditzingen, Germany
- 16:15 Enhancing Ultra-Short Pulse Laser Machining with MPLC Technology: A Leap in Micro-Processing Efficiency  
G. Pallier, Cailabs, Rennes, France
- 16:30 Upscaling of Direct Laser Interference Patterning  
A. Peter, IFSW, University of Stuttgart, Germany

**EVENING PROGRAM → 17:15 – 21:00**

- 17:15 STUTTGART LASER TECHNOLOGY – FROM PROCESS DEVELOPMENT TO FUNDAMENTAL RESEARCH, R. Weber, IFSW, University of Stuttgart, Germany
- 18:15 TRANSFER TO THE IFSW, CAMPUS VAIHINGEN, STUTTGART (1st Transfer 18:15 / 2nd Transfer 18:30)
- 19:00 VISIT OF THE IFSW (LAB TOUR)

## SLT Program: Thursday, 06 June 2024

## ROOM 01

## SLT SESSION VII → 11:00 – 12:30

**LASER PROCESSING WITH HIGH AVERAGE POWER**

Chair F. Zaiß

- 11:00 Laser and Hybrid Welding with Ultra High Power Lasers  
M. Rethmeier, Institute of Machine Tools and Factory Management, Technische Universität Berlin, Germany
- 11:30 Crystal Quartz – Ideal Material for Multi-kW Optics  
A. Laskin, AdlOptica Optical Systems GmbH, Berlin, Germany
- 11:45 Close-to-Zero Focus Shift via Closed-Loop Stabilization enabled by Head-Integrated Metrology for High Power Laser Material Processing, A. Rudolf, PRIMES GmbH, Pfungstadt, Germany
- 12:00 Effects of a 120 kW CW Laser with Focus on Metal Perforation and Steel Hardening, S. Reich, Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, Freiburg, Germany
- 12:30 LUNCH (AT "KLEINER KURSAAL") AND EXHIBITION 🍴

## SLT SESSION VIII → 14:00 – 15:30

**X-RAY IMAGING OF LASER PROCESSES**

Chair P. O'Toole

- 14:00 Observing Keyhole Behavior by means of High-Speed X-Ray Imaging, K. Schrickler, Technische Universität Ilmenau, Production Technology Group, Ilmenau, Germany
- 14:30 High Speed X-Ray Imaging of Laser Percussion Drilling with Ultrashort Laser Pulses  
M. Henn, IFSW, University of Stuttgart, Germany
- 14:45 Using High-Speed X-Ray Imaging to Better Understand the Causes of Welding Defects in E-Mobility Applications  
E. Reinheimer, IFSW, University of Stuttgart and Dr. Ing. h.c. F. Porsche AG, Stuttgart, Germany
- 15:00 Seeing inside Additive Manufacturing with the Extremely Brilliant Source  
C. Leung, UCL Mechanical Engineering, University College London, UK
- 15:30 COFFEE BREAK ☕

## SLT SESSION IX → 16:00 – 17:30

**NOVEL LASER CONCEPTS**

Chair M. Abdou Ahmed

- 16:00 Wedged Thin-Disk Laser – a Versatile Concept for Amplification of (ps)-Laser Pulses, J. Speiser, German Aerospace Center (DLR), Institute of Technical Physics, Stuttgart, Germany
- 16:30 Recent Advancements in High Power Single-Oscillator Thulium-Doped Fiber Laser Emitting in 2  $\mu\text{m}$  Region  
D. Philippovskiy, Directed Energy Research Center, Technology Innovation Institute, Abu Dhabi, United Arab Emirates
- 16:45 450 W Picoseconds Compact Laser System based on a Yb-Doped Panda Tapered Double-Clad Fiber, H. Fathi, Laboratory of Photonics, Physics Unit, Faculty of Engineering and Natural Sciences, Tampere University, Finland
- 17:00 kW-Flexiburst – High Power Versatile Ultrafast Laser  
A. Loescher, IFSW, University of Stuttgart, Germany

## ROOM 03

**MACHINE LEARNING IN MANUFACTURING**

Chair A. Michalowski

- 11:00 Artificial Intelligence in Laser Processing  
V. Rominger, TRUMPF Laser- und Systemtechnik GmbH, Ditzingen, Germany
- 11:30 Modelling of the Ablation Behavior in the Laser Structuring of 1.4310 Stainless Steel using Multiple Artificial Neural Networks  
T. Weiss, Institute for Machine Tools and Industrial Management, TUM School of Engineering and Design, Technical University of Munich, Garching, Germany
- 11:45 Enhancing Laser Cutting Precision with AI: Simplifying the Experimentation Process for Parameter Optimization through Automation, N. Bär, IFSW, University of Stuttgart, Germany
- 12:00 Application of Machine Learning in Ultrafast Laser Processing  
D. Förster, LightPulse LASER PRECISION, Weil der Stadt, Germany

**LASER MATERIALS PROCESSING OF SEMICONDUCTORS AND TRANSPARENT MATERIALS, Chair T. Menold**

- 14:00 Silicon Laser Processing for MEMS and Sensors  
M. Ametowobla, Robert Bosch GmbH, Reutlingen, Germany
- 14:30 The Edge Quality of Ultra-Thin Glass and Polymers Cleaved by Ultrafast Laser  
R. Smolin, Fluence, Warsaw, Poland
- 14:45 Energy-Efficient Process Strategies for the Production of Glass Components using CO<sub>2</sub>-Laser Technology  
T. Schmidt, Günter-Köhler-Institut für Fügetechnik und Werkstoffprüfung GmbH, Jena, Germany
- 15:00 Shedding Light on Perovskite Materials for Photovoltaics  
M. Saliba, Institute for Photovoltaics, University of Stuttgart, Germany

**LASER PROCESSING WITH SHORT AND ULTRASHORT PULSED LASERS, Chair C. Hagenlocher**

- 16:00 Shedding Light on Ultra-Fast Processes: Multiphysical Simulation of Laser Micro-Processing, A. Otto, Institute for Production Engineering and Photonic Technologies, TU Wien, Vienna, Austria
- 16:30 High Rate Laser Polishing using a Polygon Scanner  
L. Pabst, Laserinstitute Hochschule Mittweida, Germany
- 16:45 Simultaneous Micromachining with Beam Splitting of Ultrashort Laser Pulses at High Average Power for the Productive Fabrication of Microchannels  
K. Cirakoglu, IFSW, University of Stuttgart, Germany
- 17:00 High-Speed Cutting of Thin Foil Materials using Pulsed Lasers  
N. Priyam, TRUMPF Laser- und Systemtechnik AG, Ditzingen, Germany

## SLT 2024 CLOSING NOTE

- 17:30 M. Abdou Ahmed, IFSW, University of Stuttgart, Germany
- 17:30 C. Hagenlocher, IFSW, University of Stuttgart, Germany