

# CONFERENCE PROGRAM & GUIDE

September 07-10, 2020



## Table of contents

LANE organisation.....	4
Preface.....	5
Conference program.....	6
Session overview.....	6
Detailed conference program.....	8
Conference warming.....	19
Conference platform.....	20
Our sponsors 2020.....	21
Adverts of sponsors.....	22

Photos:  
K. Cvecek, K. Fuchs, K. Hofmann, F. Klämpfl,  
S. Roth, C. Scheitler, blz, i Stock, LPT



LANE website



Digital conference programm





## LANE ORGANISATION

### CONFERENCE CHAIR

Prof. Dr.-Ing. Michael Schmidt  
 Institute of Photonic Technologies  
 Friedrich-Alexander-Universität Erlangen-Nürnberg



### CONFERENCE OFFICE

Bayerisches Laserzentrum GmbH  
 Konrad-Zuse-Straße 2-6  
 91052 Erlangen  
 Germany

Phone 1: +49 (0)9131-8523239 (Markus Döring)  
 Phone 2: +49 (0)9131-9779023 (Hans-Joachim Krauß)  
 Phone 3: +49 (0)9131-9779014 (Magdalena Kestler)  
 E-Mail: [info@lane-conference.org](mailto:info@lane-conference.org)  
 URL: [www.lane-conference.org](http://www.lane-conference.org)

**LANE-HOTLINE (September 07-10, 2020):**  
**+49 (0)151-22253029**

## PREFACE



### We warmly welcome you to our 11<sup>th</sup> CIRP Conference on Photonic Technologies [LANE 2020]

Dear LANE participants,

In this year we have to face a difficult situation. Due to Covid-19 we have to limit ourselves in many situations. For us, this meant to transform LANE into a virtual conference.

We accepted the challenge and – with the help of iChair – we created a platform that allows us to hold LANE 2020 as a virtual event that is more than just attending a video call or viewing a live stream. You can expect high-class keynote speakers, a socializing event, a virtual bar, discussion and breakout rooms, attendees' profiles, a sponsors' platform and more.

We encourage you to see LANE 2020 as a chance to meet, to talk, to discuss, and to create new ideas to bring Photonic Technologies forward also in these challenging times.

Now let us look forward to interesting scientific and industrial presentations on research and development in the traditional topics of laser material processing, but also on upcoming technologies such as E-Mobility or Additive Manufacturing – not forgetting the social aspects that make our community strong.

Enjoy the conference.

Your LANE team

# SESSION OVERVIEW



# SESSION OVERVIEW



Monday, September 07

Plenary Room

1.00pm - 1.15pm	Opening: Welcome to LANE 2020					
1.15pm - 2.45pm	Keynote Session					
2.45pm - 3.15pm	WLT Award Ceremony					
3.15pm - 3.45pm	Coffee Break					
	Room I	Room II	Room III	Room IV	Room V	Room VI
3.45pm - 5.05pm	Additive Manufacturing: PBF-LB Polymers	Additive Manufacturing: PBF-LB Metals	Simulation & Modelling: Additive Manufacturing	Brazing & Soldering	Laser Beam Welding Metals	Laser Safety
5.30pm - 8.00pm	Virtual Conference Warming					

Tuesday, September 08

Room I Room II Room III Room IV Room V Room VI

10.00am - 11.20am	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: PBF-LB Metals	Simulation & Modelling: Additive Manufacturing	Laser Beam Cutting & Drilling	Laser Beam Welding Metals	Fast Beam Manipulation & Beam Shaping
11.20am - 11.40am	Coffee Break					
11.40am - 1.00pm	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: PBF-LB Metals	Sensing & Control: Additive Manufacturing	Laser Beam Cutting & Drilling	Laser Beam Welding Metals	Fast Beam Manipulation & Beam Shaping
1.00pm - 2.30pm	Lunch Break					
2.30pm - 3.50pm	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: PBF-LB Metals	Sensing & Control: Additive Manufacturing	Laser Beam Cutting & Drilling	Laser Beam Welding Polymers	Precision Processing with Short & Ultrashort Laser Pulses

Wednesday, September 09




Room I Room II Room III Room IV Room V Room VI

10.00am - 11.20am	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: PBF-LB Metals	Sensing & Control: Additive Manufacturing	E-Mobility & Batteries	Sensing & Control: Confocal Sensors & Spectroscopy	Precision Processing with Short & Ultrashort Laser Pulses
11.20am - 11.40am	Coffee Break					
11.40am - 1.00pm	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: DED & LMD	Sensing & Control: Additive Manufacturing	E-Mobility & Batteries	Sensing & Control: Welding	Simulation & Modelling: Precision Processing
1.00pm - 2.30pm	Lunch Break					
2.30pm - 3.50pm	Fundamentals in Additive Manufacturing: CRC 814 & SPP 2122	Additive Manufacturing: DED & LMD	Sensing & Control: Additive Manufacturing	E-Mobility & Batteries	Sensing & Control: Welding	Surface Treatment

Thursday, September 10

Room I Room II Room III Room IV Room V Room VI

10.00am - 11.40am	Additive Manufacturing: PBF-LB Metals	Additive Manufacturing: DED & LMD	Special Session: Laser Technology in Lithuania	Laser Assisted Processes	Simulation & Modelling: Welding	Surface Treatment
11.40am - 12.40am	Lunch Break					
12.40am - 2.20pm	Additive Manufacturing: PBF-LB Metals	Additive Manufacturing: DED & LMD	Special Session: Laser Technology in Lithuania	Laser Assisted Processes	Simulation & Modelling: Welding	Surface Treatment
2.20pm - 2.40pm	Coffee Break					
	Plenary Room					
	Closing & Best Presentation Award					

Time CEST	Plenary Session: Keynote Talks & WLT Award Ceremony (Plenary Room)	
Prof. Michael Schmidt		
1.00 - 1.15 pm	Opening: Welcome to LANE 2020 Prof. Michael Schmidt Friedrich-Alexander-Universität Erlangen-Nürnberg	
1.15 - 1.45 pm		Dynamic beam shaping: Basics and possibilities Prof. Alexander Jesacher Medical University of Innsbruck, Division of Biomedical Physics, Austria
1.45 - 2.15 pm		Atomistic and multiscale modeling of laser-induced surface modification and generation of nanoparticles Prof. Leonid Zhigilei University of Virginia, Materials Science and Engineering, USA
2.15 - 2.45 pm		On the relationship between the bulge effect and the hot cracking formation during deep penetration laser beam welding Antoni Artinov ( <i>Winner of LANE 2018 Best Presentation Award</i> ) Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
3.15pm - 3.45pm <span style="float: right;">Coffee Break</span>		
1.15 - 2.45 pm	WLT Award Ceremony Prof. Frank Vollertsen BIAS – Bremer Institut für angewandte Strahltechnik GmbH Presentation Laureate WLT Award	

Monday, September 07			
Time	Room I	Room II	Room III
3.45 - 4.05 pm	<b>Additive Manufacturing: PBF-LB Polymers</b> Prof. Stefan Hierl Laser polishing as a new post process for 3D-printed polymer parts Karsten Braun, Edgar Willenborg, Johannes Henrich Schleifenbaum	<b>Additive Manufacturing: PBF-LB Metals</b> Florian Huber Influence of isolated structural defects on the static mechanical properties of PBF-LBM components Stefan Kleszczynski, Arno Elspass	<b>Simulation &amp; Modelling: Additive Manufacturing</b> Markus Döring Geometrical model and strategy in single and multilayer structures deposited by multi-fed Directed Energy Deposition Pedro Ramiro Castro, Mikel Ortiz Edesa, Amala Alberdi Gurutxaga, Altzoi Lamikiz Mentxaka
4.05 - 4.25 pm	Laser transmission welding of additive manufactured parts: Process modifications to reduce cavities inside the weld seam Julian Kuklik, Verena Wippo, Peter Jäschke, Stefan Kaierle, Ludger Overmeyer	Metallographic study of denudation in laser powder-bed fusion R.S. Khmyrov, R.R. Ableyeva, A.V. Gusarov	Distortion prediction and compensation in laser metal deposition of large axisymmetric Ti-6Al-4V part Konstantin Babkin, Evgeniy Zemyakov, Sergei Lvanov, Artur Vildanov, Ilya Topalov, Gleb Turichin
4.25 - 4.45 pm	Improving property consistency and reliability for polyamide processed using powder bed fusion David Bourell, David Leigh	Controlling melt pool shape, microstructure and residual stress in additively manufactured metals using modified laser beam profiles Manvalbo J. Matthews, Tien T. Roehling, Saad A. Khairallah, Thejaswi U. Tumkur, Gabe M. Guss, Rongpei Shi, John D. Roehling, William L. Smith, Bey K. Vrancken, Rishi K. Ganerwala, Joseph T. McKeown	Distortion-based validation of the heat treatment simulation of Directed Energy Deposition additive manufactured parts Bassel El-Sari, Max Biegler, Benjamin Graf, Michael Reithmeier
4.45 - 5.05 pm		Multivariate prediction of laser deposited geometry based on machine vision Piotr Jurawicz, Piotr Koruba, Jacek Reiner	
5.30pm - 8.00pm	Virtual Conference Warming		

Time	Room IV	Room V	Room VI
	<b>Brazing &amp; Soldering</b> Dr. Stephan Roth Dynamic strength of laser brazed joints Steffen Wachsmauth, Wilfried Reimann, Sarah Nohndorff, Jörg Hermsdorf, Ludger Overmeyer	<b>Laser Beam Welding Metals</b> Judith Saffer Notch impact toughness of laser beam welded thick sheets of cryogenic nickel alloyed steel X8Ni9 Sergei Gook, Steffen Krieger, Andrey Gumenyuk, Abdel-Moneim El-Batshy, Michael Reithmeier	<b>Laser Safety</b> Dr. Hans-Joachim Krauß Automated free-space beam delivery system for ultrafast laser beams in the kW regime Alexander Pöler, David Brinkmeier, Matthias Buser, Volkher Onuseit, Thomas Graf
	<b>Brazing &amp; Soldering</b> Dr. Stephan Roth Manipulation of the cyclic wetting process using longitudinal filler wire oscillation in the laser brazing of zinc-coated steel sheets Thorsten Mattulat, Peer Woitzschke	<b>Laser Beam Welding Metals</b> Judith Saffer Hot-cracks reduction during Laser Beam Welding in vacuum of conventionally cast Alloy-247 LC Aleksiej Senger, Torsten Jösch, Simon Olschok, Uwe Resengen, Thomas Fischer	<b>Laser Safety</b> Dr. Hans-Joachim Krauß Realization of laser safety during outdoor laser material processing (Industrial Talk) Christian Hennings, Michael Hustedt, Alexander Brodelder, Martin Brose, Oliver Meier, Klaus Bescherer-Nachtmann, Jörg Hermsdorf, Stefan Kaierle
	<b>Brazing &amp; Soldering</b> Dr. Stephan Roth Qualification of a system technology for selective laser-based quasi-simultaneous soldering with an integrated pyrometric process control Jakob Ermer, Judith Saffer, Kerstin Schaumburger, Florian Kaufmann, Alexander Wittmann, Stephan Roth, Michael Schmidt	<b>Laser Beam Welding Metals</b> Judith Saffer Statistical analysis of pulsed laser beam welding repair strategies of nickel-base superalloys Christian Kästner, Matthias Neugebauer, Klaus Schrücker, Jean Pierre Bergmann	<b>Laser Safety</b> Dr. Hans-Joachim Krauß Aging resistance of laser protective filters (Industrial Talk) Rico Bühring, Winfried Janßen, Hans-Joachim Krauß
	<b>Brazing &amp; Soldering</b> Dr. Stephan Roth Multivariate prediction of laser deposited geometry based on machine vision Piotr Jurawicz, Piotr Koruba, Jacek Reiner	<b>Laser Beam Welding Metals</b> Judith Saffer High power fiber laser welding of titanium and nickel based alloys with and without the filler wire (Invited Industrial Talk) Mohammed Naem	<b>Laser Safety</b> Dr. Hans-Joachim Krauß Aging resistance of laser protective filters (Industrial Talk) Rico Bühring, Winfried Janßen, Hans-Joachim Krauß



Time	Room I	Room II	Room III	Room IV	Room V	Room VI
	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b>	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Simulation &amp; Modelling: Additive Manufacturing</b>	<b>Laser Beam Cutting &amp; Drilling</b>	<b>Laser Beam Welding Metals</b>	<b>Fast Beam Manipulation &amp; Beam Shaping</b>
<b>Chair</b>	<b>Michael Rasch</b>	<b>Florian Huber</b>	<b>Markus Döring</b>	<b>Clemens Roider</b>	<b>Jakob Ermer</b>	<b>Lisa Ackermann</b>
10.00 - 10.20 am	Use of (nano-)additives in Laser Powder Bed Fusion of Al powder feedstocks: Research directions within the last decade Ihsan Murat Kusoglu, Bilal Gökcce, Stephan Barcikowski	Influence of process gas during powder bed fusion with laser beam of Zr-based bulk metallic glasses Jan Wegner, Maximilian Frey, Stefan Kleszczynski, Ralf Busch, Gerd Wittl	Experimental study and modeling of melt pool in laser powder-bed fusion of thin walls S.A. Egorov, R.S. Khmyrov, A.D. Korotkov, A.V. Gusarov	Image-based roughness estimation of laser cut edges with a convolutional neural network Leonie Felicia Tatzei, Fernando Puente León1	Microstructure and mechanical properties of dissimilar Ti/Nb/Cu steel laser joints Antonio Mammucì, Iyona Tomashchuk, Rodolphe Boid, Alexandre Mathieu, Sébastien Lafaye	Ultrafast stamping by combination of synchronized galvanometer scanning with DOE's or SLM Markus Gainer, Stefan Marco Remund, Michalina Veronica Chaja, Torsten Mähner, Beat Neuenschwander
10.20 - 10.40 am	Surface inoculation of aluminium powders for additive manufacturing of Al-7075 alloys Pascal Vieh, M. Voigt, Christoph Ebbert, B. Mikereit, Evgeny Zhuraviev, B. Yang, Olf Kessler, Guido Grundmeier1	Laser Powder Bed Fusion of NdFeB and influence of heat treatment on microstructure and crack development Nicole Emminghaus, Christian Hoff, Jörg Hermsdorf, Stefan Kaerle	FE-Simulation of the influence by material defects on the endurance of additive built metal parts Patrick Alexander Raif, Jan-Philipp Wenzl, Peter Lindecke, Claus Emmelmann	Application of machine learning to predict the product quality and geometry in circular laser grooving processes Esmaeil Ghadiri Zahrami, Farzamarz Hqati, Amir Daneshi, Bahman Azarhoushang, Jürgen Wilde	Laser welding with side-gas application and its impact on spatter formation and weld seam shape Goran Jovic, Axel Bormann, Johannes Pröll, Stefan Böhm	Beam shaping and splitting for high-power USP-lasers Martin Kallit, Dirk Nodop, Jan Rücker
10.40 - 11.00 am	Laser powder bed fusion of WE43 in hydrogen-argon-gas atmosphere Avid Abel, Yvonne Messarages, Stefan Jumi, Christian Hoff, Jörg Hermsdorf, Christian Klose, Hans Jürgen Maier, Stefan Kaerle, Ludger Overmeyer	Mechanical properties of NiCrBSi self-fluxing alloy after LPBF with additional heating Igor Shishkovsky, Nina Kalovkina, Vladimir Scherbakov	Design of electrode for electrolytically manufactured via laser-based powder bed fusion Atte Heiskanen, Evelina Repo, Heidi Pili	Laser cutting with annular intensity distribution Hao Pang, Tobias Haecker	Laser welding of additively manufactured medium manganese steel alloy with conventionally manufactured dual-phase steel Hannes Zapf, Matthias Hölemann, Claus Emmelmann	High power, high speed, high accuracy: the world's smartest polygon mirror scanner (Industrial Talk) Florian Rößler, Robby Ebert, Sascha Klötzer, André Streek
11.00 - 11.20 am	Snapshot hyperspectral imaging for quality assurance in laser powder bed fusion Niklas Gerdes, Christian Hoff, Jörg Hermsdorf, Stefan Kaerle, Ludger Overmeyer					Highly dynamic positioning of individual laser beams in a multi-beam system for laser surface processing Cskar Hofmann, Olga Chernenko, Johannes Finger, Stephan Eifel, Jochen Stollenwerk, Peter Loosen
11.20am - 11.40am Coffee Break						

Time	Room I	Room II	Room III	Room IV	Room V	Room VI
	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b>	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Sensing &amp; Control: Additive Manufacturing</b>	<b>Laser Beam Cutting &amp; Drilling</b>	<b>Laser Beam Welding Metals</b>	<b>Fast Beam Manipulation &amp; Beam Shaping</b>
<b>Chair</b>	<b>Dominic Bartels</b>	<b>Florian Huber</b>	<b>Eric Eschner</b>	<b>Johannes Heberle</b>	<b>Florian Kaufmann</b>	<b>Clemens Roider</b>
11.40 am - 12.00 pm	Experimental investigations on the influence of temperature for Laser Metal Deposition with lateral Inconel 718 wire feeding Thomas Bergs, Sebastian Kammann, Gabriel Frega Barbosa da Silva, Jan Riepe, Kristian Amtz	Surface integrity factors influencing fatigue crack nucleation of laser powder bed fusion Ti6Al4V alloy Anna Maria Viardelli, Gunnel Fredriksson, Frédéric Cabanettes, Alexey Sova, Pavel Krakhmalev	In-situ monitoring in L-PBF: opportunities and challenges (Invited Talk) Bianca Maria Colosimo, Marco Grasso	Effect of reduced ambient pressure and atmospheric composition on material removal mechanisms of steel and aluminum by means of high-speed laser processing Peter Hellwig, Klaus Schrickler, Jean Pierre Bergmann	In situ determination of the critical straining condition for solidification cracking during laser beam welding Nasim Bakir, Andrey Gumenyuk, Vitaly Pavlov, Sergey Volvenko, Michael Reithmeier	Compensation strategy for positioning inaccuracies in robot-based laser structuring (Industrial Talk) Bergs Thomas, Martin Kallit, Oliver Henrichs, Ankit Shrivastava, Claudio Schirrmann
12.00 - 12.20 pm	Processing of 316L hybrid parts consisting of sheet metal and additively manufactured element by powder bed fusion using a laser beam Thomas Paake, Marion Merklein	Characterization of IN718 recycling powder and its effect on LPBF manufactured parts Sara Sandino, Silvia Martinez, Aitzol Lemikiz	Analysis of time, frequency and time-frequency domain features from acoustic emissions during laser powder-bed fusion process Yagnaashwara Pandeyan, Rita Dresi Daoudi, Sergey Shevchik, Giulio Masrulli, Roland Logé, Kilian Wesmer	Controlling the kerf properties of underwater laser cutting of stainless steel with 3 mm thickness using an Yb:YAG laser source in nuclear decommissioning processes Jan Leschke, Benjamin Emde, Jörg Hermsdorf, Stefan Kaerle, Ludger Overmeyer	Laser beam welding of heat-resistant mixed joints using laser-based pre- and post-heating Judith Saffer, T. Dörres, Kerstin Schaumburger, Jakob Ermer, Florian Kaufmann, Alexander Wittmann, Stephan Roth, Michael Schmidt	Focus shift control of a novel 30 kW laser remote scanner for large-scale industrial sheet and plate metal applications Georg Lerwenka, July Palermna, Mohamed Elshehawy, Jörg Wollnack, Claus Emmelmann
12.20 - 12.40 pm	Effect of nanoparticle addition on the microstructure and microhardness of oxide dispersion strengthened steels produced by laser powder bed fusion and directed energy deposition Carlos Doñate Buendia, René Straubel, Philipp Künsteiner, Markus B. Wilms, Felix Stern, Jochen Tenkamp, Enrico Bruder, Stephan Barcikowski, Baptiste Gault, Karsten Dürst, Johannes Henrich Schlieffenbaum, Frank Walther, Bilal Gökcce	Influence of contaminants on part quality during Laser-based Powder Bed Fusion of nickel base alloys Mathias Sebastian Palm, Max Horn, Andreas Bachmann, Georg Schlick, Michael F. Zaeh, Günther Reinhart	Detecting spattering phenomena by using high-speed imaging in L-PBF of 316L Eetu Kivirasi, Heidi Pili, Kevin Minnet-Lallemant, Juha Kotila	Real-time monitoring of fiber laser cutting of thick plates by means of photodiodes Nikita Levichev, Gonçalo Costa Rodrigues, Joost R. Duffou	Hybrid laser-arc welding of thick-walled pipe segments with optimization of the end crater Omer Usündağ, Sergei Gook, Andrey Gumenyuk, Michael Reithmeier	Shaping focal intensity distributions with freeform optics for optimal material processing (Industrial Talk) Henrike Wilms, Ulrike Fuchs
12.40 - 1.00 pm	Laser additive manufacturing of hot work tool steel by means of a starting powder containing partly spherical pure elements and ferroalloys Anna Tautzits, Corinna Herdes, Arne Röttger, Volker Uhlirwinkel, Abotcarab Begerzadeh Chehrneh, Werner Theisen, Frank Walther, Hens-Werner Zoch	Impact of laser irradiation on microstructure and phase development of tungsten carbide - cobalt Tobias Schwanekeamp, Joachim Gussone, Martin Reuber	A proof-of-concept analysis relating dimensions of a melt pool to its vibrational behavior to control a laser-based additive manufacturing process Gábor Árpád, Julien Enveltdt, Patrick Guillaume	Optimizing the CO2 laser cutting behavior of polycarbonate (Industrial Talk) Julia Janik, Can Dogan, Malte Hemmerich	Investigations on pulsed laser beam welding of thin steel sheets in lap configuration over the face side/parallel joint Jan Graczyk, Sarah Notherduft, Jörg Hermsdorf, Stefan Kaerle, Ludger Overmeyer	Variable expanding of high power laser beams (Pecha Kucha Talk) Cornelia Halbhuber
1.00pm - 2.30pm Lunch Break						



Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	Michael Rasch	Florian Huber	Pablo Dilger	Frederik Buckstegge	Prof. Thomas Frick	Johannes Heberle
2.30 - 2.50 pm	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b>	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Sensing &amp; Control: Additive Manufacturing</b>	<b>Laser Beam Cutting &amp; Drilling</b>	<b>Laser Beam Welding Polymers</b>	<b>Precision Processing with Short &amp; Ultrashort Laser Pulses</b>
2.30 - 2.50 pm	A comparison of material models for the simulation of selective beam melting processes (Invited Talk) Christian Burkhardt, Dominic Soldner, Julia Margheim	Features of structure-sensitive hard magnetic alloy Fe – 25 wt. % Cr – 15 wt. % Co manufactured by Laser Powder Bed Fusion Anton S. Zhukov, Boris B. Barakhtin, Anton V. Kamynin, Ivan S. Gavrilov, Pavel A. Kuznetsov	How to ensure reproducible laser beam parameters in selective laser melting processes (Industrial Talk) C. Dini, Nicolas Meunier	Multi objective optimization of water jet guided laser micro drilling on Inconel 718 using Taguchi Method Levent Subasi, Mustafa I. Gokler, Ulas Yaman	Absorber-free laser transmission welding of transparent polymers using fixed focus optics and 3D laser scanner Friedrik Maiwald, Stephan Englmaier, Stefan Hfief	Pulsed laser micro ablation of polycrystalline cubic boron nitride Berend Denkena, Alexander Krödel, Almd. Heckmeyer, Maria Murrenhoff
2.50 - 3.10 pm	Scaling melt pool geometry over a wide range of laser scanning speeds during laser based Powder Bed Fusion Markus Döring, Guillaume Boussinot, Jan-Frederik Hagen, Markus Apel, Stefanie Kohl, Michael Schmidt	Hybrid moulds – mixture of additive manufacturing by laser melting and conventional machining (Industrial Talk) Thorsten Hickmann, Toni Adamek	Calibration approach for reliable in-situ process monitoring of multi-optic selective laser melting Daniel Alberts, Marco Standfuß, Dieter Schwarze, Gerd Witt	Laser forming of holes in brittle materials assisted by stress reduction through heating Anatoli Abramov, Alejandro Becker	Correlation between weld seam morphology and mechanical properties in laser transmission welding of polypropylene M.-L. Röhrich, T. Stiche, S. Roth, P. Brauer, M. Schmidt, S. Will	High-power ultrashort pulse laser machining of tungsten carbide Berend Denkena, Alexander Krödel, Lars Eilersiek, Marita Murrenhoff
3.10 - 3.30 pm	Eutectic solidification in Al-Ni for L-PBF conditions: a phase-field simulation study Markus Apel, Guillaume Boussinot, Markus Döring, Michael Schmidt	Additive manufacturing of soft and hard magnetic materials Dagmar Göll, Julian Schurr, Felix Trauter, Jochen Schanz, Timo Bernthaler, Harald Riegel, Gerhard Schneider	Assessment and verification of internal channels fabricated by laser powder bed fusion Lokesh Chandrabalan, Markus Baier, Roberto Meloni, Luca Ammannato, Eugenio Del Puglia, Simone Carmignato	Multiphase simulation of high throughput CO <sub>2</sub> laser via drilling for High-Density-interconnect (HDI) applications (Industrial Talk) Zhibin Liu, Jan Kleinert	Scanning techniques for optimized damage tolerance in quasi-simultaneous laser transmission welding of plastics Andreas Schuktow, Karsten Scholle, Peter Fuhrberg, Thomas Frick	Production of chip breakers on cemented carbide tools using laser ablation Berend Denkena, Alexander Krödel, Lars Eilersiek, Marita Murrenhoff
3.30 - 3.50 pm	Additive manufacturing of binary Al-Li alloys Burak Yürekli, Lisa Schade, Tobias Ullsperger, Brian Seyfarth, Hagen Kohl, Gabor Matthäus, Dongmei Liu, Markus Rettenmayr, Stefan Nolle	Simultaneous in operando monitoring of keyhole depth and absorbance in laser processing of AISI 316 stainless steel at 200 kHz Troy Allen, Brian Simonds, Jack Tanner, James Fraser	Simultaneous in operando monitoring of keyhole depth and absorbance in laser processing of AISI 316 stainless steel at 200 kHz Troy Allen, Brian Simonds, Jack Tanner, James Fraser	Manufacturing low-cost fluidic and heat transfer devices by selective transmission laser welding (Industrial Talk) Oguzhan Der, Stuart Edmondson, Volengo Bertola	Femtosecond lasers in micro material processing: 3 application fields (Pecha Kucha Talk) Boris Ruffing	

Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	Alexander J. Sommerreyns	Florian Huber	Karen Schwarzkopf	Dr. Florian Klämpfl	Tobias Staudt	Dr. Kristian Cvecek
10.00 - 10.20 am	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b>	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Sensing &amp; Control: Additive Manufacturing</b>	<b>E-Mobility &amp; Batteries</b>	<b>Sensing &amp; Control: Confocal Sensors &amp; Spectroscopy</b>	<b>Precision Processing with Short &amp; Ultrashort Laser Pulses</b>
10.00 - 10.20 am	Particle-based simulation, dimensional analysis and experimental validation of laser absorption and thermo-viscous flow during sintering of polymers Claas Bierwisch, Shoya Mohseni-Mofidi, Bastien Diekmann, Torsten Kraft, Johannes Rudloff, Maneluse Lang	Benchmark parts for the evaluation of optimized support structures in Laser Powder Bed Fusion of metals Katharina Bartsch, Joost Ohrenberg, Claus Emmelmann	OCT sensor for layer height control in DED using SIEMENS machine controller (Industrial Talk) Markus Kogel-Hollacher, Matthias Strebel, Christian Staudermaier, Heinz-Ingo Schneider, Daniel Regulin	Increasing the process window of copper welding applications by adapting the power density distribution (Industrial Talk) Falk Nagel, Peter Kallagie	In-situ measurement of surface roughness using chromatic confocal sensor Shaowei Eu, Wei Sheng Kor, Fang Cheng, Leong Kee Seah	A study on ultrafast laser micro-machining and optical properties of amorphous polyether(ether) ketone (PEEK) films Qianliang Li, Walter Parrie, Yue Tang, Olivier Allegre, Janet Ho, Paul Chalke, Zhaoqing Li, Stuart Edmondson, Geoff Dearden
10.20 - 10.40 am	Experimental investigations for improved modelling of the laser sintering process of polymers Johannes Rudloff, Maneluse Lang, Shoya Mohseni-Mofidi, Claas Bierwisch	Three levels of software applications for a digitalized additive manufacturing process chain (Industrial Talk) Sven Ackermann, Tobias Kolb, Jan Tremel, Michael Schmidt	Geometrical control of DED processes based on 3D scanning applied to the manufacture of complex parts Iker Garmentia, Von Flores, Mikel Madarieta, Aitzol Lamikiz, Luis Gerardo Uriarte, Carlos Soriano	Challenges and opportunities in laser welding of 6xxx high strength aluminium extrusions in automotive battery tray construction Tianzhu Sun, Pasquale Franciosa, Mikhail Sokolov, Dariusz Ceglarek	Large range closed-loop scans with a focal-distance-modulated confocal sensor Janik Schaubke, Andreas C. Gröschl, Tino Hausotte	Ablation and functionalization of flexographic printing forms using femtosecond lasers for additively manufactured polymer-optical Waveguides Alexander Wierntke, Gerd-Albert Hoffmann, Jürgen Koch, Peter Jäschke, Ludger Overmeyer, Stefan Katerle
10.40 - 11.00 am	Experimental determination of scattering processes in the interaction of laser radiation with polyamide 12 powder Thomas Schuffenhauer, Thomas Stichel, Michael Schmidt	Parameter identification approach for support structure in laser powder bed fusion and analysis of influencing factors Matthias Schmitt, Bernhard Kempter, Georg Schlick, Gunther Reinhart	A multi-parameter control of track geometry and melt pool size for laser metal deposition Dieter Tyrala, Henry Köhler, Thomas Seefeld, Claus Thomy, Ryuchi Narita	Nanosecond pulsed fiber laser as a tool for laser micro welding Eile Haddad	Double pulse laser induced breakdown spectroscopy at 600 bar water pressure Benjamin Ende, Stefan Spiekermann, Michael Huse, Jörg Hermsdorf, Jörg Neumann, Maik Frede, Stefan Katerle	Milling applications with GHz Burst: Investigations concerning the removal rate and machining quality Stefan Marco Remund, Markus Gather, Michalina Veronica Chaja, Alvaras Urniezu, Simes Butkus, Beat Neuenschwander
11.00 - 11.20 am	Infrared monitoring of modified hatching strategies for laser sintering of polymers Sandra Greiner, Dietmar Drummer	Improving the quality of up-facing inclined surfaces in laser powder bed fusion of metals using a dual laser setup Jilka Météikova, Daniel Ordnung, Yan-nis Kinds, Ann Witvrouw, Brecht Van Hooreweder	In situ process monitoring by optical microphone for crack detection in Laser Metal Deposition applications (Industrial Talk) Camilo Priego, Roberto Fernandez, Carlos Gonzalez, Marcos Diaz, Jorge Arias, Ryan Sommerhuber, Fabian Lücking	Spatially-resolved crystallinity determination of polymer welding seams by Raman-microscopy Philipp A. B. Braeuer, Leo A. Bahr, Marie-Luise Röhrich, Michael Schmidt, Stefan Will	Micro processing with ultrafast bursts of pulses Stephan Bräuning, Kenning Du, Arnold Gilner	

Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	Dr. Thomas Stichel	Oliver Hentschel	Eric Eschner	Dr. Stephan Roth	Pablo Dilger	Stefanie Kohl
11.40 am - 12.00 pm	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b> On the development of polymer particles for Laser Powder Bed Fusion via precipitation Maximilian A. Dechert, Jochen Schmidt	<b>Additive Manufacturing: DED &amp; LMD</b> Study of the elaboration of high entropy material from powder by laser additive manufacturing Gautier Huser, Ibrahim Demirci, Pascal J. Aubry, Ivan Guillot, Loïc Perriere, Emmanuel Rigal, Hicham Maskrot	<b>Sensing &amp; Control: Additive Manufacturing</b> Model-based pyrometer alignment method for additive manufacturing by laser metal deposition David Dilkötter, Magnus Thiele, Johann Stoppok, Cemal Esen, Martin Mönningmann	<b>E-Mobility &amp; Batteries</b> Contacting of 18650 lithium-ion batteries and copper bus bars using pulsed green laser radiation Michael K. Kick, Jan Bernd Habedanck, Johannes Helmeyer, Michael F. Zaeh	<b>Sensing &amp; Control: Welding</b> Correlation analysis between the beam propagation and the vapor capillary geometry by machine learning Christian Stadler, Michael Kick, Maximilian Schmölter, Michael Zäh	<b>Simulation &amp; Modelling: Precision Processing</b> Laser Metal Bonding (LMB) - low impact joining of thin aluminum foil to silicon and silicon nitride surfaces Oliver John, Jan Paschen, Angela De Rose, Bernd Steinhäuser, Gernot Emanuel, Andreas Brand, Jan Nekarda
12.00 - 12.20 pm	Production of PBT/PC multi-material particles via a combination of co-grinding and spray-agglomeration for powder bed fusion Elorentin Biedel, Björn Düsenberg, Jochen Schmidt, Andreas Bück, Wolfgang Peukert	Laser glass deposition of spheres for printing micro lenses Katharina Reitschlag, Arndt Hohmoltz, Peter Jäschke, Dietmar Kracht, Stefan Kalerle, Roland Lachmayer	Laser metal deposition controlling: Melt pool temperature and target / actual height difference monitoring Magnus Thiele, David Dilkötter, Johann Stoppok, Martin Mönningmann, Cemal Esen	Laser beam welding of copper foil stacks using a green high power disk laser Sophie Grabmann, Lazar Tomacic, Michael F. Zaeh	An autonomous laser weld seam planning and tracking system by integrating OCT to scanner-based laser machines (Industrial Talk) Florian Seiler, Marcel Gmeiner, Peter Hoffmann	Numerical modelling of action on transparent semiconductors of short and ultrashort laser pulses with wavelength at the material absorption edge Alexander Grigorev, Roman Nikolaev, Olga Velchko
12.20 - 12.40 pm	Enhancement of polyamide laser sinter powder reusability by acid catalyzed hydrolysis Nicolas Hesse, Wolfgang Peukert, Jochen Schmidt	Process characterization in laser metal deposition of hot work tool steel (Industrial Talk) Michael Guepner, Christian Rochholz, Jens Biedtner, Henning Zeidler	Spatial distributed spectroscopic monitoring of melt pool and vapor plume during the laser metal deposition process Dieter De Baere, Wim Devesse, Jan Heisen, Patrick Guillaume	Comparison of different system technologies for continuous-wave laser beam welding of copper Eric Puzal, Florian Hugger, Robert Döringer, Thom Lembit Dinkelbach, Andreas Burger	Adaptive process monitoring for laser micro structuring of electrical steel using optical coherence tomography with non-colour corrected lenses Fabian Zechel, Rouven Kurze, Patrick Widmann, Robert H. Schmitt	Simulation of direct and blis-ter-assisted laser-induced forward transfer techniques Juan José Moreno-Abella, David Munoz-Martin, Andrés Marquez, Miguel Morales, Carlos Molpeceres
12.40 - 1.00 pm	Scaling up colloidal surface addition of polymer powders for laser powder bed fusion Tim Hupfeld, Carlos Doñate-Buendia, Matthias Krause, Alexander Sommerer, Andreas Wegner, Thorsten Simeon, Michael Schmidt, Bilal Gökce, Stephan Barcikowski	Offline powder-gas nozzle jet characterization for coaxial Direct Laser Metal Deposition Zsóé Járódi, Patrick Guillaume, Julien Erveldt, Michael Hinderdael, Galid Arroud	Temperature field based closed-loop control of laser hot wire cladding for low dilution Dieter Tyralla, Thomas Seefeld	Blue high-power laser sources for processing solutions in e-mobility and beyond Simon W. Britten, Laurens Schmid, Thomas Molitor, Markus Rütering	Investigation of the melt dynamics during the laser impulse metal bonding process with keyhole measurement Yoo-Sik Chung, Justin Reska, Alexander Olowinsky, Arnold Gillner	Simulation-based process development for laser processing with ultra-short pulses (Industrial Talk) Urs Eppell, Müller Ludger, Schadt Manfred, Ziegler Jörg, Seitz Daniel
<b>1.00pm - 2.30pm Lunch Break</b>						

Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	Dr. Thomas Stichel	Oliver Hentschel	Karen Schwarzkopf	Dr. Stephan Roth	Tobias Staudt	Johannes Heberle
2.30 - 2.50 pm	<b>Fundamentals in Additive Manufacturing: CRC 814 &amp; SPP 2122</b> Evaluation of essential powder properties through complementary particle size analysis methods for laser powder bed fusion of polymers Alexander Sommerer, Tim Hupfeld, Bilal Gökce, Stephan Barcikowski, Michael Schmidt	<b>Additive Manufacturing: DED &amp; LMD</b> Concept development for the generation of support structures in the laser metal deposition process Jan Marx, Magnus Thiele, Cemal Esen, Andreas Ostendorf	<b>Sensing &amp; Control: Additive Manufacturing</b> MICLAD as a platform for real-time monitoring and machine learning in laser metal deposition Julien Erveldt, Patrick Guillaume, Jan Heisen	<b>E-Mobility &amp; Batteries</b> The challenge of welding mixed copper and aluminum with a single mode laser (Industrial Talk) Elke Kaiser, Christian Jauch, Evangelos Papastathopoulos, Guenter Ambrusy, Alexander Killi	<b>Sensing &amp; Control: Welding</b> Simultaneous high-speed x-ray transmissive imaging and absolute dynamic absorbance measurements during high-power laser-metal processing Brian J. Simonds, Jack Tanner, Alexandra B. Artuso-Glimpse, Paul Williams, Niranjan Parab, Cang Zhao, Tao Sun	<b>Surface Treatment</b> Laser texturing to control the wettability of materials (Invited Talk) A. Riveiro, P. Pou, J. del Val, R. Comesaña, F. Arias-González, F. Lusuquitos, M. Boutin-guiza, F. Quintero, A. Badaouia, Juan Pou
2.50 - 3.10 pm	Investigation of the electrophotographic powder deposition through a transfer grid for efficient additive manufacturing Sebastian-Paul Kopp, Thomas Stichel, Stephan Roth, Michael Schmidt	LMD coatings as filler material for laser beam welded 30 mm thick plates Anne Strauß, Ömer Üstündağ, Andrey Gumenyuk, Michael Reithmeier	Comparison of visual and hyperspectral monitoring of the melt pool during Laser Metal Deposition Jorge Sanchez Medina, Wim Devesse, Julien Erveldt, Patrick Guillaume	Dynamic laser beam shaping for laser aluminium welding in e-mobility applications Camilo Prieto, Eva Vaamonde, David Diego-Valejo, Jesus Jimenez, Benayahu Urbach, Yaniv Vidne, Eyal Shekel	Camera-based closed-loop control for beam positioning during deep penetration welding by means of keyhole front morphology Pablo Dilger, Eric Eschner, Michael Schmidt	Role of roughness levels induced by the laser texturing on the wettability behaviour of ABS Julien Molimoux-López, Iban Quintana, Eva Rodriguez-Vidal, Ruth Diez-Aheco, Ariz Reolaza, Carlos Molpeceres
3.10 - 3.30 pm	Directed Energy Deposition of PA12 multi-walled carbon nanotube composites with a fiber laser Yunus Kulu, Yannik L. Wencke, Gerrit A. Luinstra, Cemal Esen, Andreas Ostendorf	The approaches to design and manufacturing of large-sized marine machinery parts by direct laser deposition Rudolf Korsnik, Igor Tsybul'skiy, Aleksander Rodionov, Olga Klimova-Korsnik, Maria Gogolukhina, Sergei Ivanov, Grigoriy Zdyblyan, Ruslan Mendegaliyev	The easiest and most repeatable M2 measurement: as easy as measuring laser power (Industrial Talk) Michael Scaggs, René Sattler, Gilbert Haas	Influence of power distribution on weld seam quality and geometry in laser beam welding of aluminum alloys Eric Puzal, Florian Hugger, Thom Dinkelbach, Andreas Burger	Acoustic process monitoring in laser beam welding Leander Schmidt, Florian Römer, David Böttger, Frank Lemenbach, Benjamin Straß, Bernd Woller, Klaus Schrickler, Marc Seibold, Jean Pierre Bergmann, Giovanni Del Galdo	Laser beam activation of polymer surfaces for selective chemical metallization Michael Seiler, Jann Gruben, Andreas Krauß, Andrea Barz, Jens Biedtner
3.30 - 3.50 pm	Gravity-driven powder application for additive manufacturing Joerg Volpp, Himani Siva Prasad, Frank Brückner	Gravity-driven powder application for additive manufacturing Joerg Volpp, Himani Siva Prasad, Frank Brückner	In situ monitoring of Cu/Al laser welding using laser induced fluorescence Brian J. Simonds, Bao Tran, Paul Williams	Process control by real-time pulse shaping in laser beam welding of different material combinations Marc Seibold, Hannes Friedmann, Klaus Schrickler, Jean Pierre Bergmann	A study of the effects of NIR laser radiation on interlaminar fracture toughness of CFRP Hagen Dittmar, Peter Jaeschke, Stefan Kalerle, Ludger Overmeyer	



Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	<b>Dominic Bartels</b>	<b>Oliver Hentschel</b>	<b>Dr. Stephan Roth</b>	<b>Prof. Thomas Frick</b>	<b>Stefanie Kohl</b>	<b>Dr. Katja Tangemann-Cerk</b>
10.00 - 10.20 am	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Additive Manufacturing: DED &amp; LMD</b>	<b>Special Session: Laser Technology in Lithuania</b>	<b>Laser Assisted Processes</b>	<b>Simulation &amp; Modelling: Welding</b>	<b>Surface Treatment</b>
10.00 - 10.20 am	Microstructure and mechanical properties of selective laser melting of hydrogen embrittled resistance stainless steel HR-2 Xiantang Shen, Guowei Wang, Zhiyao Cheng, Shengwang Zhang, Qin Yang, Shuke Huang	Single-crystal height extension by Laser Metal Deposition of CMSX-4 Irene Buchbender, Christian Hoff, Jörg Hermsdorf, Volker Wesling, Stefan Kaerle	Laser technology development in Lithuania Gediminas Račiukaitis	Macroscopic bending deformations and mechanical properties of Al2024-T351 thick plates with laser peen forming in a cantilever state Junfeng Wu, Zhigang Che, Shikun Zou, Xia Huang, Ziwen Cao, Ruijian Sun	Investigation of the influences of the process parameters on the weld depth in laser beam welding of AA6082 using machine learning methods Maximilian Schmoeller, Christian Stadler, Markus Wagner, Michael F. Zaeh	Localized dispersing of TiB2 and TiN particles via pulsed laser radiation for improving the tribological performance of hot stamping tools Stephan Schürdewahn, Felix Spranger, Kai Hilgenberg, Marion Merklein
10.20 - 10.40 am	Processing of water atomized low alloy steel powder in Laser Powder Bed Fusion Tatiana Fedina, Jesper Sundqvist, Alexander F. H. Kaplan, Anna Larsson, Sven Bengtsson	Development of laser metal depositing applications Juzas Dūdūtis, Jokūbas Pipiras, Simon Schwarz, Stefan Rung, Ralf Hellmann, Gediminas Račiukaitis, Paulius Gečys	Laser-fabricated axicons for glass Linas Jonušauskas	Experimental research on CFRTP-Al alloy laser butt joining Junke Jiao, Yiyun Ye, Shaohui Jia, Zifa Xu	Numerical analysis of the effect of residual stresses in formed aluminum sheet metal parts on the hot crack formation during laser beam welding Jonas Wagner, Christian Hagelocher, Rudolf Weber, Maximilian Bachmann, Celalettin Karadogan, Mathias Liewald, Thomas Graf	Homogeneous annealing of TiO2, ZrO2 and ITO sol-gel layers with CO2 laser Michael Desjars, Kristin Weeang, Arndt Hohnholz, Peter Jäschke, Stefan Kaerle, Ludger Overmeyer
10.40 - 11.00 am	In situ heat accumulation by geometrical features obstructing heat flux and by reduced inter layer times in laser powder bed fusion of AISI 316L stainless steel Gunther Mohr, Nils Scheuschner, Kai Hilgenberg	Investigation of cracking causes during multi-pass laser cladding of heat-resistant single crystal nickel alloy Rudolf Korsnik, Olga Kimova-Korsnik, Ekaterina A Valdayseva, Ilya Udin	Hybrid additive-subtractive 3D manufacturing using femtosecond lasers (Industrial Talk) Linas Jonušauskas	Hybrid laser joining of RTM acrylic glass fiber composite with stainless steel Bernabe Carcel, Samuel Lopez, Alfonso Carcel, Pierre Gerard	The influence of residual stresses on laser beam welding processes of aluminium sheets Christian Hagelocher, Jonas Wagner, Johannes Michel, Rudolf Weber, Maximilian Bachmann, Celalettin Karadogan, Mathias Liewald, Thomas Graf	Femtosecond laser shock peening on the surface of NiTi shape memory alloy Hao Wang, Evgeny L. Gurevich, Andreas Ostendorf
11.00 - 11.20 am	Characterization of part deformations in powder bed fusion of stainless steel 316L Niko Rikonen, Heidi Pili	Comparative analysis of the gamma prime phase formation in Nickel alloys in additive manufacturing Gleb A Turichin, Olga G Kimova-Korsnik, Ekaterina A Valdayseva, Andrey V Alekseev, Maria V Rashkovets	Hybrid additive-subtractive 3D manufacturing using femtosecond lasers (Industrial Talk) Linas Jonušauskas	Laser-assisted joining of AISI 304 thin sheets with polymers Klaus Schröder, Alexander Drebing, Marc Seibold, Jean Pierre Bergmann	Benefit of high feed rates on the process efficiency in laser beam welding Eveline Nicole Reinheimer, Florian Felzer, Rudolf Weber, Thomas Graf	Combined laser hardening and laser surface texturing forming tool 1.2379 Enderlechner, Melkornen, Aragay, Eric Gäfner, Andreas Schubert
11.20 - 11.40 am	Influence of metal powder cross-contaminations on part quality in Laser Powder Bed Fusion: copper alloy particles in maraging steel feedstock Max Horn, Lukas Langer, Mario Schafnitzel, Simone Dietrich, Georg Schlick, Christian Seidel, Gunther Reinhart	Case study on AM of an IN718 aircraft component using the LMD process Lothar Kittel, A. Gasser, K. Wissenbach, C. Zhong, J.H. Schlierbaum, F. Palm	Pre and post-treatments to improve weldability and mechanical properties of Aluminum-Polyamide laser welded specimens Mahdi Amme Elahi, Marcus Koch, Mike Heck, Peter Piapper	Pre and post-treatments to improve weldability and mechanical properties of Aluminum-Polyamide laser welded specimens Mahdi Amme Elahi, Marcus Koch, Mike Heck, Peter Piapper	Multi-cycle phase transformation during laser hardening of AISI 4140 Yang Lu, Heiner Meyer, Tim Radel	
<b>Lunch Break</b>						

Time	Room I	Room II	Room III	Room IV	Room V	Room VI
Chair	<b>Michael Rasch</b>	<b>Oliver Hentschel</b>	<b>Dr. Kristian Cvecek</b>	<b>Prof. Thomas Frick</b>	<b>Stefanie Kohl</b>	<b>Clemens Roeder</b>
12.40 - 1.00 pm	<b>Additive Manufacturing: PBF-LB Metals</b>	<b>Additive Manufacturing: DED &amp; LMD</b>	<b>Special Session: Laser Technology in Lithuania</b>	<b>Laser Assisted Processes</b>	<b>Simulation &amp; Modelling: Welding</b>	<b>Surface Treatment</b>
12.40 - 1.00 pm	New tailored high strength & ductile Al-alloys for laser powder bed fusion (LPB-F) (Industrial Talk) Frank Palm, Marco Bärli, David Schimback	Study on feasibility of the dissimilar 316L/Nb/Ti6Al4V W/LAM clads (Industrial Talk) Antoine Marmuac, Sébastien Lafaye, Iryna Tomashchuk, Rodolphe Bolot, Alexandre Mathieu	Unconventional material processing samples performed with Atlantic industrial picosecond laser (Industrial Talk) Atlas Juronis	Investigation of minimal strokes of NiTi shape memory wires using laser activation Marvin Schuller, Benedict Theren, Philipp Maack, Bernd Kuhlentötter, Cemal Esen	Numerical study of additional element transport in wire feed laser beam welding Xiangmeng Meng, Antoni Artinov, Marcel Bachmann, Michael Reithmeier	Generation of laser-induced periodic surface structures on different glasses by a picosecond-pulsed laser Kay Bischoff, Peter Stuart Quigley, Arndt Hohnholz, Peter Jäschke, Stefan Kaerle
1.00 - 1.20 pm	Influence of the process parameters on the absorptance during Laser-based Powder Bed Fusion of AISI10Mg Andreas Wimmer, Meja Lehmann, Adrian Schuler, Michael Zaeh	Study of the reinforcement phase dilution into the metal matrix in functionally graded Stellite 6 and WC metal matrix composite by laser metal deposition Marta Osblaza, Jon Inaki Arizubieta, Magdalena Cortina, Aitzol Lamikiz	Efficient ablation by ultra-short pulse lasers Andrius Žemaitis, Paulius Gečys, Gediminas Račiukaitis, Mindaugas Gečvilas	Development of form-fit connection for NiTi shape memory wire actuators using laser processing Marvin Schuller, Malte Becher, Fabian Franke, Burkhard Maas, Cemal Esen	Revisiting transport phenomena and their role in intermixing during dissimilar laser beam welding Martin Datmen, Berkan Deniz, Dirk Peiring	Influence of the surface roughness and pulse energy in the production of dimple features on Cr2O3 surfaces Juan Ignacio Alvariz-Torres, Martin Sharp, Mehdi Seddighi
1.20 - 1.40 pm	Analysis of the phase transformation of AISI10Mg during Laser Powder Bed Fusion Andreas Wimmer, Meja Lehmann, Adrian Schuler, Michael Zaeh	Additive manufacturing of LMD nozzles for multi-material processing Robert Bernhardt, Philipp Neef, Tim Eismann, Henning Wiche, Christian Hoff, Jörg Hermsdorf, Stefan Kaerle, Volker Wesling	High pulse energy femtosecond laser with tunable GHz and MHz burst (BiBurst) for material processing (Industrial Talk) Titas Gertus, Simas Buikus	Laser-assisted narrow gap arc welding of an 18MND5 steel thick plate Alexandre Mathieu, Julia Thechenko, Iryna Tomashchuk, Eugen Cicala, Rodolphe Bolot	Simulation of keyhole laser welding of stainless steel plates with a gap Pierre Drobnjak, Andreas Otto, Rodrigo Gómez-Vázquez, Rosa Maria Arias, Jorge Luis Arias	Ultrashort pulse laser micro polishing of steel – Investigation of the melt pool depth Martin Osblö, Andreas Brenner, Leon Röther, Johannes-Thomas Finger
1.40 - 2.00 pm	Effects of process interruptions on the microstructure and tensile properties of AISI10Mg parts manufactured by Laser-based Powder Bed Fusion Maximilian Florian Binder, Cheechau Leong, Christine Anslätt, Georg Schlick, Christian Seidel, Gunther Reinhart	Vertical Laser Metal Wire Deposition of Al-Si alloys Adrien Da Silva, Siyong Wang, Joerg Volpp, Alexander Friedrich Hermann Kaplan	Experimental investigation of distortion behavior of laser heat treated blanks Nikolaos Rigas, Marion Merklein	Simulation of quasi-simultaneous laser transmission welding of plastics: optimization of material parameters in broad temperature range Johannes Kästner, Anton Schmalzl, Jens Prehm, Tobias Loose, Stefan Hierl	Simulation of surface defects during laser polishing of tool steel Bastian Meylan, Ivan Calderon, Quang Tri Le, Kilian Wäsmar	Investigations of surface defects during laser polishing of tool steel Bastian Meylan, Ivan Calderon, Quang Tri Le, Kilian Wäsmar
2.00 - 2.20 pm	Specific aspects of the transitional layer forming in the aluminum bronze - stainless steel functionally graded structures after laser metal deposition Konstantin Igorevich Makarenko, Oleg Nikolaevich Dubinin, Petr Gennadievich Shornikov, Igor Vladimirovich Shishkovsky	Specific aspects of the transitional layer forming in the aluminum bronze - stainless steel functionally graded structures after laser metal deposition Konstantin Igorevich Makarenko, Oleg Nikolaevich Dubinin, Petr Gennadievich Shornikov, Igor Vladimirovich Shishkovsky	Comparison of boiling bubble behavior during laser chemical machining under superatmospheric pressure Marcel Simons, Tim Radel, Vinay Shanta, Frank Volterisen	Comparison of boiling bubble behavior during laser chemical machining under superatmospheric pressure Marcel Simons, Tim Radel, Vinay Shanta, Frank Volterisen	Preliminary machine learning analysis and high-speed thermographic visualization of the laser polishing process Jack Beylous, Evgeny V. Bordatchev, Remus O. Tutunea-Fatan	Preliminary machine learning analysis and high-speed thermographic visualization of the laser polishing process Jack Beylous, Evgeny V. Bordatchev, Remus O. Tutunea-Fatan
<b>Coffee Break</b>						

Closing & Best Presentation Award	
Time	Chair
2.40 - 3.10 pm	Prof. Michael Schmidt
Closing & Best Presentation Award	

Status as of August 28, 2020; subject to modifications; please find latest information in the online-program

# CONFERENCE WARMING



Get together in a relaxed atmosphere and meet interesting people.

Enjoy our virtual bar or enter into an adventure with our Match Roulette.

Have fun in our escape rooms, unravel the matchstick puzzle, join our photonic quiz and more. At the end maybe you are the lucky winner of a Lego drone.

So, mix your drink, wear your hat and enjoy the evening!

**On Monday, September 07, at 5.30 pm**

The Conference Warming is sponsored by





## CONFERENCE PLATFORM



For the first time LANE will take place as a virtual event. To meet this challenge, we cooperate with iChair to create a convenient and interactive platform:

- Watch live talks and discussions.
- Plan your conference individually with 'My Program'.
- Watch pre-recorded video presentations of the talks.
- Discuss specific topics with other experts in the forum channels.
- Network with our 'Matchmaking' tool.
- Let's go on an adventure on 'Match Roulette'.
- Visit our 'Bar Tables' during coffee and lunch breaks or whenever you want.
- Get in touch with the experts in the 'Sponsor Booths'.
- Get together and have fun in relaxed atmosphere at our 'Conference Warming'.

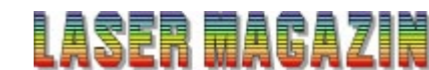
### How to participate at virtual LANE:

- 1) Make sure that you are registered in ConfTool; create your account and your personal profile at the conference platform hosted by iChair.
- 2) Install the Zoom app on your computer or mobile device (<https://zoom.us/download>); test Zoom by joining a test meeting (<https://zoom.us/test>).
- 3) Test BigBlueButton, which will be used for Match Roulette and private 1-to-1 meetings, by joining a test meeting (<https://test.bigbluebutton.org>).
- 4) Test your internet connection; the download speed should be at minimum 6 Mbps (<https://www.speedtest.net>).
- 5) Test your audio and video equipment for proper function.
- 6) Check your background the camera catches and ensure a sufficient lighting.

### How to present at virtual LANE:

Speakers find useful information in our „*Technical Guide for Presenting Authors*“ here: [www.lane-conference.org/download-technical-guide-for-presenting-authors](http://www.lane-conference.org/download-technical-guide-for-presenting-authors).

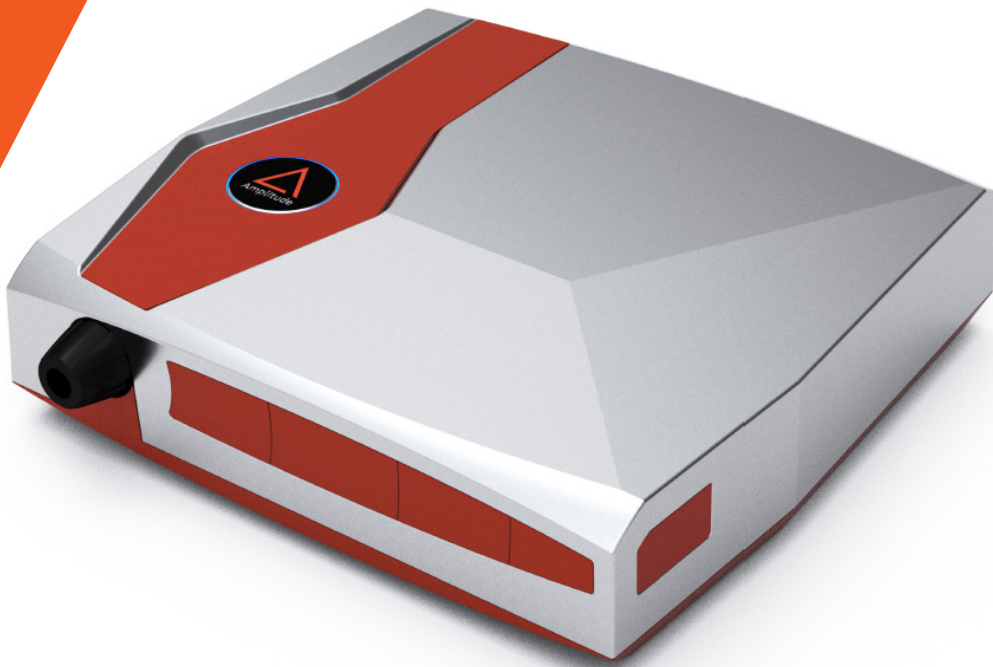
## OUR SPONSORS 2020





# The Most Powerful Industrial Ultrafast Laser

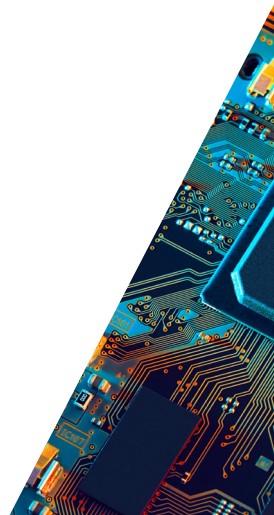
## Tangor 300



- > 300 W
- > 100 W UV
- < 500 fs

Ideal for  
Microtexturing  
Microelectronics  
Micromachining  
High Speed microcutting  
and drilling

More information at  
[amplitude-laser.com](http://amplitude-laser.com)





## Expanding knowledge



The special features of Additive Manufacturing require to rethink all business units, from product development up to sales. The empirical and professional knowledge you need for restructuring, though, is often hard to obtain.

In order to support companies that are interested in Additive Manufacturing the Application Center Additive Manufacturing has been initiated by the Institute of Photonic Technologies (Friedrich-Alexander-Universität Erlangen-Nürnberg) together with the Bayerisches Laserzentrum GmbH in 2018.

## The facility provides:

- experts in the field of Additive Manufacturing who perform practice-oriented seminars.
- access to a industrial grade machines, e.g. laser beam melting machine SLM 280.
- the know-how and infrastructure of two established research institutions.
- the possibility for networking in the field of Additive Manufacturing.

With this, the Application Center Additive Manufacturing makes a decisive contribution to develop an extensive knowledge base in your company. As a result, an appraisal of the technology and an effective use of the numerous advantages of Additive Manufacturing for your own production processes will be enabled.

## CONTACT US

Institute of Photonic Technologies  
Friedrich-Alexander-Universität Erlangen-Nürnberg  
Konrad-Zuse-Straße 3/5  
91052 Erlangen  
Germany  
Phone: + 49 (0)9131 - 8523241

Florian Huber, M. Sc.  
Research assistant Additive Manufacturing  
E-Mail: [florian.huber@lpt.uni-erlangen.de](mailto:florian.huber@lpt.uni-erlangen.de)

Michael Rasch, M. Sc.  
Research assistant Additive Manufacturing  
E-Mail: [michael.rasch@lpt.uni-erlangen.de](mailto:michael.rasch@lpt.uni-erlangen.de)



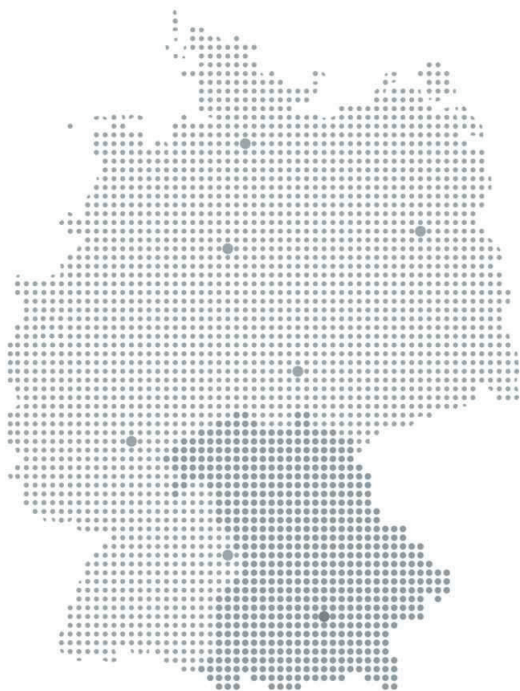


**bayern photonics**

Innovationsnetz Optische Technologien



**Good ideas need  
good contacts**



- Technology transfer
- Cooperation projects
- Project management
- Support of start-ups
- Marketing
- Education and training

Member of



Innovation Networks for  
**Optical Technologies**

[www.bayern-photonics.de](http://www.bayern-photonics.de)



Laser safety



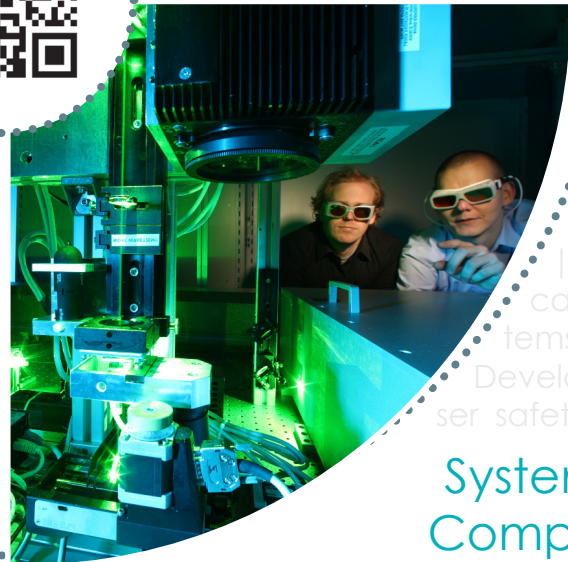
Consulting and Development

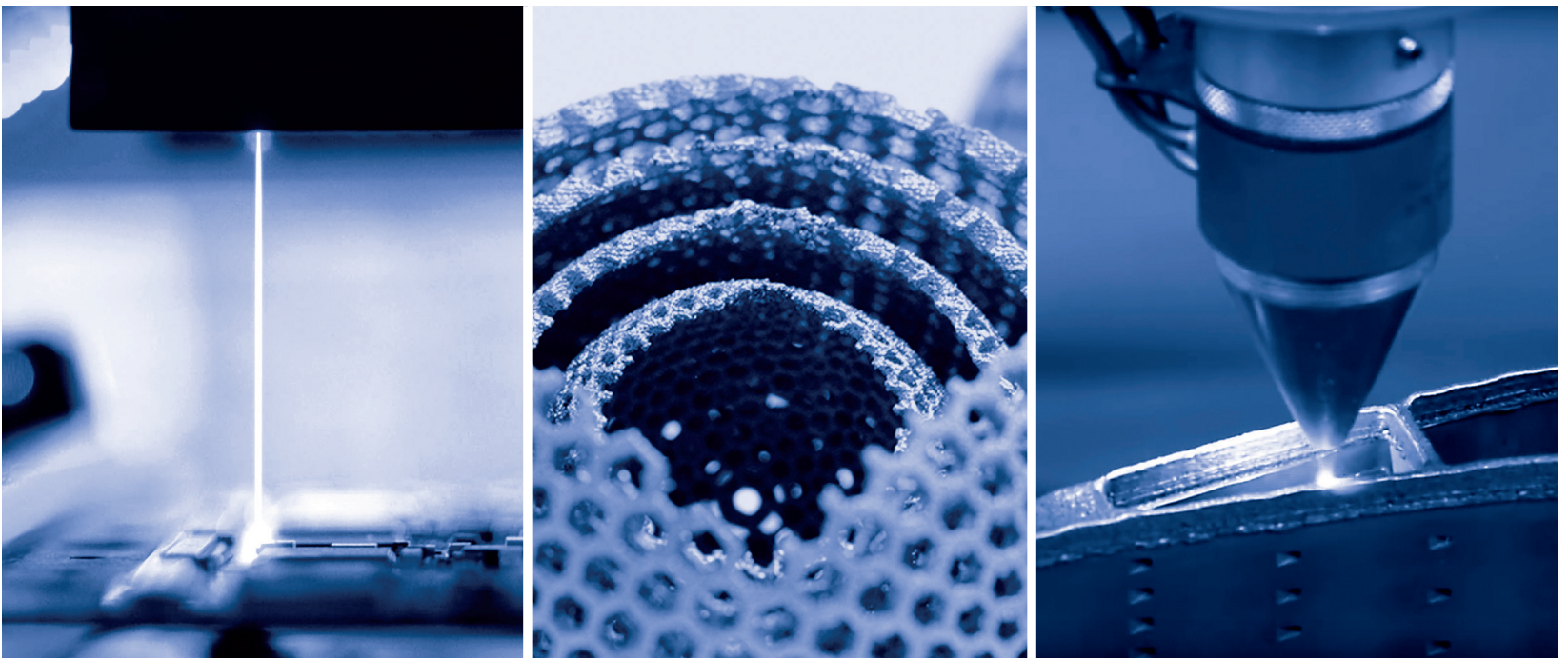


Education and Training



Systems and Components





# FASTER, HIGHER POWER LASER MEASUREMENT

**PowerMax-Pro kW and HP Sensors** incorporate the new Coherent **transverse thermoelectric technology** to enable fast laser power measurement up to 3 kW average and 15 kW peak power levels – at speeds **1 million times faster** than thermopiles and calorimeters. While saving valuable time, PowerMax-Pro brings new laser analytics to microelectronics and material processing applications.

**Learn More—**[go.coherent.com/powermax-pro](https://go.coherent.com/powermax-pro)



PowerMax-Pro  
HP Sensor

 **COHERENT**<sup>®</sup>  
Superior Reliability & Performance



# Let HAMAMATSU PHOTONICS help you find the best solution for your business



Finding a solution with the ideal combination of sensitivity, speed, size and cost can be a challenge with any application. So start your search with the company that is proud of its long history of collaboration with many of the world's leading manufacturers – supplying award winning, high quality detectors which are developed for your success.

**HAMAMATSU**  
PHOTON IS OUR BUSINESS

[www.hamamatsu.com](http://www.hamamatsu.com)

# HOLOEYE

The Experts in Phase Only Spatial Light Modulators

HOLOEYE offers a great variety of LCOS based Spatial Light Modulators. Versions for wavelength ranges starting at the UV at 355 nm up to versions for the C-Band up to 1700nm.

Pixel pitches from 8  $\mu\text{m}$  down to 3.74  $\mu\text{m}$  and resolutions from 1920x1080 up to 4160 x 2464 pixel. There are also versions available featuring dielectric mirror coatings for use with higher power lasers.



**Pioneers in Photonic Technology**

Pioneers in Photonic Technology

[www.holoeye.com](http://www.holoeye.com)



Advancing physics across international boundaries for the past 100 years

## INTERNATIONAL COMMISSIONS

- C1: Commission on Policy and Finance
- C2: Commission on Symbols, Units, Nomenclature, Atomic Masses and Fundamental Constants
- C3: Statistical Physics
- C4: Astroparticle Physics
- C5: Low Temperature Physics
- C6: Biological Physics
- C8: Semiconductors
- C9: Magnetism
- C10: Structure and Dynamics of Condensed Matter
- C11: Particles and Fields
- C12: Nuclear Physics
- C13: Physics for Development
- C14: Physics Education
- C15: Atomic, Molecular, and Optical Physics
- C16: Plasma Physics
- C17: Laser Physics and Photonics
- C18: Mathematical Physics
- C19: Astrophysics
- C20: Computational Physics

## AFFILIATED COMMISSIONS

- AC1: International Commission for Optics
- AC2: International Commission on General Relativity and Gravitation
- AC3: International Commission for Acoustics
- AC4: International Commission on Medical Physics

## WORKING GROUPS

- WG1: International Committee for Future Accelerators (ICFA)
- WG2: Communication in Physics
- WG5: Women in Physics
- WG7: International Committee on Ultrahigh Intensity Lasers (ICUIL)
- WG9: International Cooperation in Nuclear Physics (ICNP)
- WG10: Astroparticle Physics International Committee (ApPIC)
- WG11: Gravitational Wave International Committee (GWIC)
- WG12: Energy
- WG13: Newtonian constant of Gravitation
- WG14: Accelerator Science
- WG15: Soft Matter
- WG16: Industry
- WG17: Centenary

## AIMS

- To stimulate and promote international cooperation, communication, research and education in physics;
- To foster inclusiveness and diversity in physics;
- To uphold openness, honesty and integrity in the practice, application and promotion of physics;
- To support the free circulation of scientists;
- To promote international agreements on symbols, units and nomenclature; and cooperating with other organizations on disciplinary and interdisciplinary problems.
- To help in the application of physics toward solving problems of concern to humanity.

# 2022

The yearlong **CENTENARY** celebrations will:

- Increase awareness of physics discoveries and the close ties among physicists at research centres globally.
- Stimulate worldwide interest in physics and science, as a tool for education and a motor of innovation, technology & economic development.
- Reach out to the global physics community, national science organisations, policy-makers, societies, students, families and the general public.

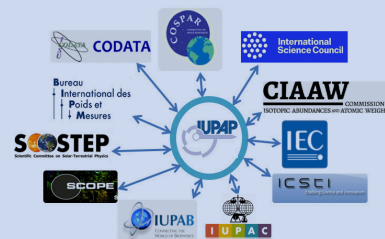


## Conference Sponsorship

Each year, IUPAP sponsors and endorses ~ 50 conferences annually with special attention given to those held in developing countries.



## Inter Union Relations



## Young Scientist Awards & Commission Awards

~200 prizes have been awarded in the last 10 years



## Contact Us

IUPAP Singapore Nanyang Technological University, Nanyang Executive Centre #04-09, 60 Nanyang View, Singapore 639673  
Tel: +65 6592 7784 • Email: IUPAP.Admin@ntu.edu.sg • Website: www.iupap.org

# LPM2021

The 22nd International Symposium  
on Laser Precision Microfabrication

**June 8-11, 2021**

Hirosaki, Aomori, Japan



## The 22nd International Symposium on Laser Precision Microfabrication Hirosaki Citizen Hall, Hirosaki, Aomori, Japan

**June 8 to June 11, 2021**

<http://www.jlps.gr.jp/lpm/lpm2021/>

### **AIM AND SCOPE:**

Miniaturization and high precision are rapidly becoming requirements in many industrial processes and products. As a result, there is greater interest in the use of laser micro fabrication approaches to achieve these goals. The International Symposium on Laser Precision Microfabrication (LPM) is alternatively held in Japan and in other host countries. To date, LPM has been successfully hosted in Omiya, Singapore, Osaka, Munich, Nara, Williamsburg, Kyoto, Vienna, Quebec, Kobe, Stuttgart, Takamatsu, Washington D.C., Niigata, Vilnius, Kokura, Xi'an, Toyama, Edinburgh, Hiroshima and Dresden (Web Conference). The aim of this symposium is to provide a forum for discussion of fundamental aspects of laser-matter interaction, the state-of-the-art of laser materials processing, and topics for the next generation with fundamental scientists, end users and laser manufactures. We expect that LPM2021 would play an important role not only for understanding fundamental knowledge of laser precision microfabrication but also forecasting future technologies to be developed and the future laser market.

### **CHAIR, CO-CHAIRS, STEERING COMMITTEE CHAIR:**

General Chair: Dr. Hiroyuki Niino, AIST, Japan

Co-Chairs: Prof. Yongfeng Lu,  
University of Nebraska-Lincoln, USA

Prof. Michael Schmidt,  
Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Prof. Yasuhiro Okamoto, Okayama University, Japan

Steering Committee Chair:

Prof. Yasutaka Hanada, Hirosaki University, Japan

### **ORGANIZED BY:**

Japan Laser Processing Society (JLPS)

c/o JWRI, Osaka University

11-1 Mihogaoka, Ibaraki, Osaka 567-0047, Japan

TEL/FAX: +81-6-6879-8642

E-mail: [lpm2021@jlps.gr.jp](mailto:lpm2021@jlps.gr.jp)



## TOPICS:

1. Fundamental aspects (Dynamics, modeling, simulation, etc.)
2. Laser and photochemistry
3. Ultra-short pulse laser processing
4. Burst ablation
5. Advanced laser processing (Fiber laser, disc laser, FEL, etc.)
6. Glass/Ceramic processing
7. VUV laser and X-ray processing
8. Nanotechnology
9. Nano ripple formation
10. Nano- and micro-particles
11. Micro-machining
12. Micro-drilling and micro-cutting
13. Micro-welding and micro-bonding
14. Micro-forming
15. Micro-patterning and micro-structuring
16. Surface processing (Texturing, cleaning, annealing, modification, etc.)
17. 3-D micro- and nano-fabrication
18. Film deposition and synthesis of advanced materials (PLD, CVD, etc.)
19. Laser-based direct-write techniques
20. Laser-induced forward transfer (LIFT) techniques
21. Lithography (including EUV source and application)
22. Laser devices
23. Beam shaping
24. Optics and systems for laser microprocessing
25. Process monitoring and control
26. Packaging and mounting process
27. Manufacture of micro devices and systems
28. Medical and biological applications
29. Industrial applications
30. Others
31. Special Session (SS1): TBA
32. Special Session (SS2): TBA
33. Special Session (SS3): TBA



### About Hirosaki:

Hirosaki is located in the southwestern part of the northernmost prefecture on Japan's main island, Aomori prefecture. The city is blessed with beautiful and grand natural resources where you can enjoy the nature of Japan throughout the four seasons. The city is also known as a castle town of cherry blossoms and apples. You can also enjoy delicious seafoods from the surrounded seas and sake. The conference venue is located in Hirosaki park to enjoy the sight of the castle.

<https://www.hirosaki-kanko.or.jp/en/edit.html?id=edito1>





# LASER MAGAZIN

LASER TECHNOLOGY · ADDITIVE MANUFACTURING · PHOTONICS · NEW MATERIALS

## 37 YEARS OF LASER MAGAZIN

LASER MAGAZIN regularly reports on the application of laser technology and opto-electronics in all branches of industry as well as institutes and laboratories.

The industry's latest technological developments are highlighted in the MAIN TOPIC of each issue. The journal focuses on practice-oriented articles under a variety of headings including Laser Welding, Laser Cutting, Laser Safety, Laser Sources and Systems, Photonics, Additive Manufacturing and more. Future trends are reflected under headings such as News from the Laser Centres, Lasers in Research, Lasers in Medical and Biotechnology, Nanotechnology and New Materials. Exclusive interviews with key people from research and industry round off the spectrum of articles.

The content, design and service meet the high requirements placed on a high-tech journal worth reading and promoting sales.





Messe München

Connecting Global Competence



THE **LEADING LIGHT**  
SEE YOU IN JUNE 2021

JUNE 21–24, 2021, MESSE MÜNCHEN

25th World's Leading Trade Fair with Congress  
for Photonics Components, Systems and Applications

[world-of-photonics.com](http://world-of-photonics.com)

**LASER** World of **PHOTONICS**





## Wissen wie der Markt tickt!



LASER, die Fachzeitschrift für Laser-Technologie informiert durch Grundlagen- und Praxisberichte, Interviews und Reportagen und vermittelt den Lesern einen umfassenden Überblick über die Möglichkeiten und Einsatzgebiete der Lasertechnik.

## Und weil nützliche Fachinformationen Zukunft haben, bloggen wir.



unter [www.laser-technologieforum.de](http://www.laser-technologieforum.de) erscheint an jedem Freitag ein ausführlicher Blog-Beitrag zu den Trends der Woche. **Nicht verpassen!**

Everything you need to know  
about optical technologies

now on

[laser-photonics.eu](http://laser-photonics.eu)



laser+  
**photonics**

---





16. - 17. März 2021  
Stadthalle Fürth

24. Seminar und Industrieausstellung rund um  
„Laser in der Elektronikproduktion &  
Feinwerktechnik“

[www.lef.info](http://www.lef.info)

# Subscribe for free\*

**Does your laser system cut it?**

A magazine dedicated to integrators  
and users of laser systems

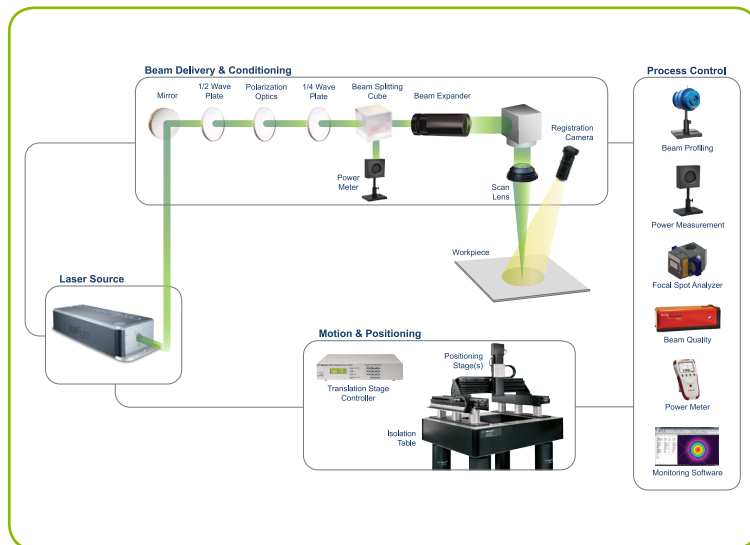


**Do you subscribe? Register for free now!**  
[lasersystemseurope.com/subscribe](https://lasersystemseurope.com/subscribe)



# We Have You Covered

Surround the Workpiece<sup>®</sup> with Our Full Portfolio of Solutions



Surround the Workpiece<sup>®</sup> is an MKS offering that serves the needs of Advanced Markets that require laser-based solutions. We provide customers with the key components, systems, and services to enable the successful implementation of these solutions, including:

- Full Portfolio of Laser, Photonics, and Optics Solutions
- Application Labs and Support
- Integrated Business Solutions
- Engineering and Development
- Calibration and Repair

For more information visit [www.newport.com](http://www.newport.com) or call +49 6151 708-0.

# optence

## NETWORKING IN PHOTONICS

We have **110 members**, most of them in Hessen, Rhineland-Palatinate and North Rhine Westphalia.

Our focus topics are **optical manufacturing, laser technology, sensor technology and lighting.**

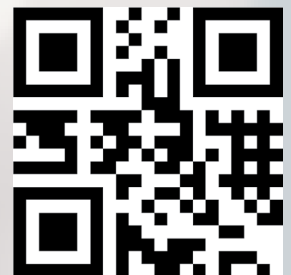
We see ourselves as a **service provider** for our members, supporting innovations and strengthening their economic potential.

We offer **contacts in the photonic industry**, working groups, marketing support, events and trainings, the standardization group metrology and **information.**

Please contact us!

Daniela Reuter  
reuter@optence.de

Phone: 0049-6732-935122



[www.optence.de](http://www.optence.de)





We invite highly qualified  
and motivated students to apply for



## Master Programme (MAOT) Doctoral Scholarships (SAOT)

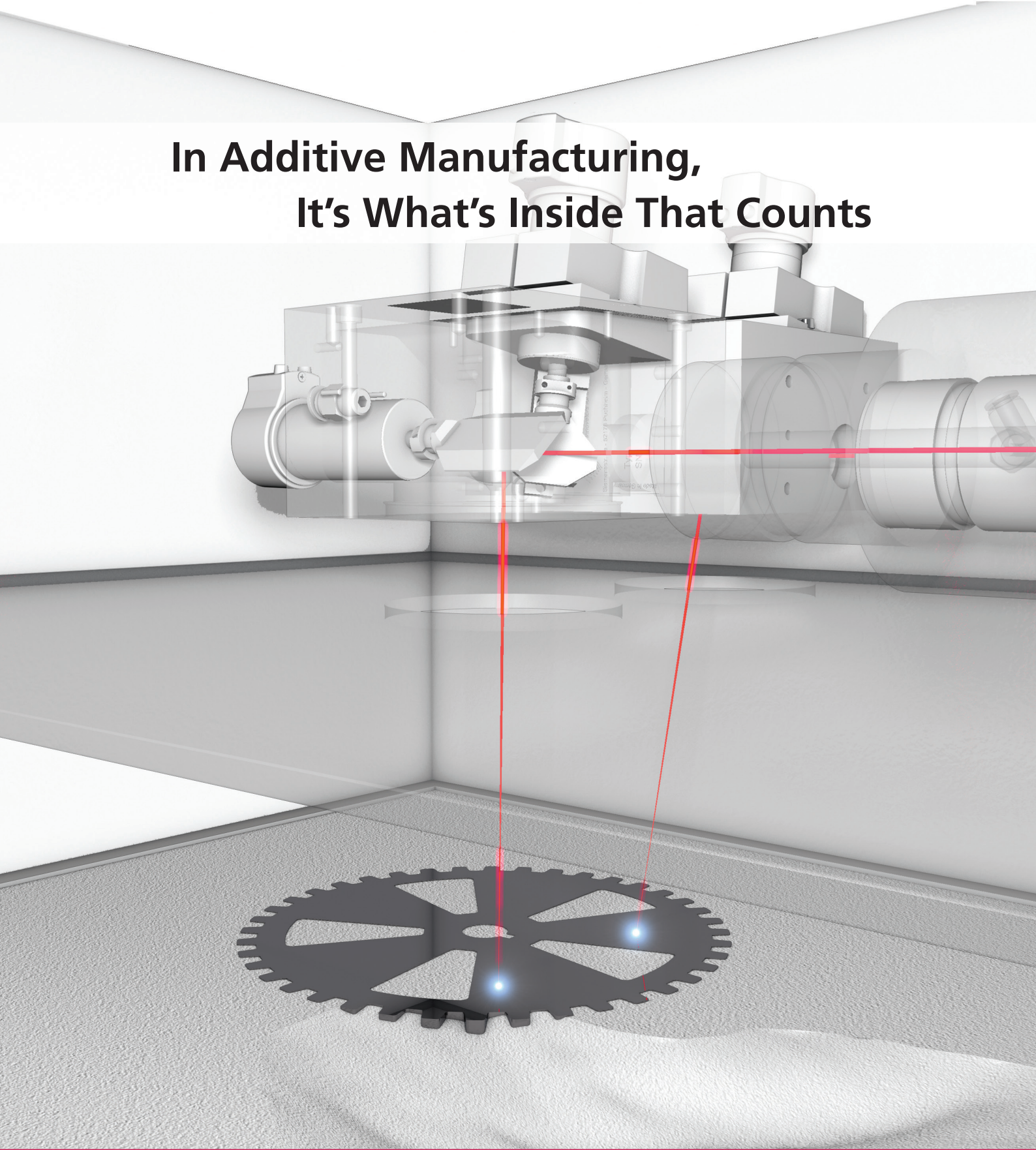
### Topics in Advanced Optical Technologies

- Optical Metrology
- Optical Material Processing
- Optical Materials and Systems
- Optics in Medicine
- Optics in Communication and Information Technology
- Computational Optics



HOME RUN FROM  
BACHELOR TO PH.D.  
IN OPTICAL TECHNOLOGIES

# In Additive Manufacturing, It's What's Inside That Counts



For 30 years, we've been powering laser processes and ensuring highest precision in laser sintering applications.

Market-leading high performance scan solutions and laser beam positioning equipment – Made in Germany.



**OPTICAL COMPONENTS  
IN HIGHEST QUALITY**

**Sill  
OPTICS**



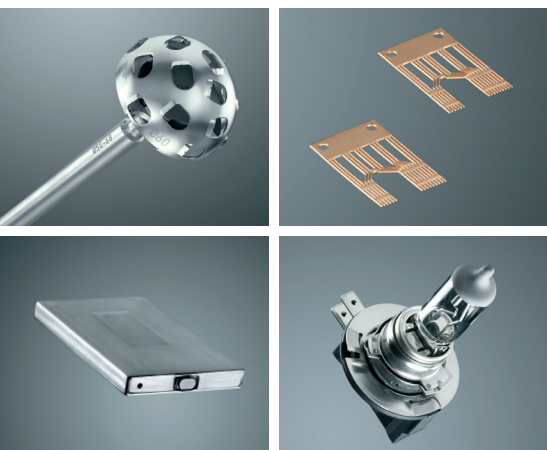
**Innovative products for  
laser applications and  
machine vision**

**Sill Optics GmbH & Co. KG**  
Johann-Höllfritsch-Str. 13  
D-90530 Wendelstein  
[www.silloptics.de](http://www.silloptics.de)





Wer in der Feinbearbeitung  
kleinste Abweichungen  
erkennt, hat gute Augen.  
Aber falsches Werkzeug.



TRUMPF Laser für die Feinbearbeitung.  
Höchste Präzision bei jeder Anwendung.

Egal, ob zum Feinschneiden oder -schweißen – mit den gepulsten Lasern TruPulse oder den Faserlasern TruFiber bieten wir Ihnen für jede Aufgabe in der industriellen Feinbearbeitung die optimale Lösung.

Die Laser von TRUMPF arbeiten konstant präzise und garantieren gleichzeitig höchste Produktivität. Profitieren auch Sie von unserer jahrzehntelangen Erfahrung.

[www.trumpf.com/s/feinbearbeitung](http://www.trumpf.com/s/feinbearbeitung)

