

2021 High Power Laser Ablation Agenda

as of 4/8/2021

Tuesday, 13 April 2021 Times listed as Eastern Daylight Time (EDT) (USA and Canada)	
10:00 - 10:05	Conference Introduction and Review of Conference Logistics Dr. Claude Phipps, Photonic Associates
10:05 - 10:45	KEYNOTE: First Results on the Laser Photon Engine for Interstellar Probes Dr. S. Pete Worden, Breakthrough Initiatives
Biological Applications of Lasers Session Chairs: Dr. Tatiana Itina, CNRS & Mihaela Filipescu, National Institute for Lasers, Plasma and Radiation Physics	
10:45 - 11:05	Laser Fabricated Coatings for Biomedicine Dr. Mihaela Filipescu, National Institute for Lasers, Plasma and Radiation Physics
11:05 - 11:25	Ultra-Short Laser Surface Functionalization: From Modeling to Bioengineering Dr. Tatiana Itina, CNRS
11:25 - 11:45	Nano-Micro Biointerfaces by Using Laser Methods for Evaluating the In Vitro Cellular Response: The Quest for Bone Regeneration Continues Mrs. Valentina Dinca, National Institute for Lasers, Plasma and Radiation Physics
11:45 - 12:05	Mesenchymal Stem Cells Interaction with Hierarchical Textured Surfaces Obtained by Laser Processing Mrs. Valentina Dinca, National Institute for Lasers, Plasma and Radiation Physics
POSTER: Fabrication of Biosensors for Heavy Metal Detection by Laser Transfer Dr. Mihaela Filipescu, National Institute for Lasers, Plasma and Radiation Physics	
12:05 - 12:35	Networking Roundtables
12:35 - 12:40	Announcements & Keynote Introduction
12:40 - 1:20	KEYNOTE: Shaping Femtosecond Laser Interactions Inside Silica Fibers and Films Prof. Peter Herman, University of Toronto
Fundamentals of Ultra-Short and Ultra-High Power Laser-Matter Interactions: Theory, Simulations, Experiments, and Technology Developments Session Chair: Dr. Victor Hasson, Consultant-Lasers and Electro-Optic Systems and Prof. Leonid Zhigilei, University of Virginia	
1:20 - 1:40	Controllable Ablation of Nano-Layer Thin Films by Single-Pulse Femtosecond Laser Irradiation Dr. Biljana Gaković, Vinča Institute of Nuclear Sciences
1:40 - 2:00	Nonlinear Excitation of Solids and Transient Band Gap Dynamics upon Femtosecond Laser Irradiation of Semiconductors: Insights from First Principles Simulations Dr. Thibault Derrien, HiLASE Centre - Institute of Physics CAS
2:00 - 2:20	Advances and Perspectives of Laser-Generated Metal-, Alloy-, and Oxide-Based Nanomaterials in Heterogeneous Catalysis Dr. Sven Reichenberger, University of Duisburg-Essen
2:20 - 2:40	Large-Scale Atomistic Simulations of Nanoparticle Generation and Surface Modification by Short Pulse Laser Ablation in Liquid Environment Prof. Leonid Zhigilei, University of Virginia
2:40 - 3:00	Modeling of Water Droplet Excitation and Shattering by Ultrashort Laser Pulses Dr. Anton Rudenko, College of Optical Sciences
3:00 - 3:15	Break
3:15 - 3:35	Long Wavelength Ultrafast Carrier Interactions in Semiconductors and Gases: From Mode-Locking in Semiconductor Disk Lasers to Kerr Nonlinearity Suppression in the Atmosphere Prof. Jerome Moloney, University of Arizona
3:35 - 3:55	Time-Domain Model of Non-Monochromatic Photoionization of Direct-Gap Non-Metal Crystals by Ultrashort Laser Pulses Dr. Vitaly Gruzdev, University of New Mexico
3:55 - 4:15	Multiphysics Full-Wave Numerical Modeling of the Femtosecond Laser Surface Processing Formation Dynamics in Metals Dr. Larousse Khosravi Khorashad, University of Nebraska-Lincoln
4:15 - 4:35	Hydrodynamic Effects in BiSn Eutectic at a (ns) Pulsed Laser Ablation Process Mr. Tariq Alharby, University of Missouri-Kansas City
4:35 - 4:55	Ultrashort Bessel Laser Beam for Material Structuration Mr. Sebastian Lavin-Varela, Laser Physics Centre - The Australian National University
4:55 - 5:15	Simulations of the Atmospheric Propagation of High Power 10.6-Micron Square Frame Beams Generated by Unstable CO2 Resonators Dr. Paris Panagiotopoulos, University of Arizona
5:15 - 5:35	Million Degrees Celsius for Igniting Fusion is Not Longer Needed: Use Non-Thermal ps-CPA-Laser Pulses Prof. Dr. Heinrich Hora, The University of New South Wales

2021 High Power Laser Ablation Agenda

as of 4/8/2021

Wednesday, 14 April 2021			
Times listed as Eastern Daylight Time (EDT) (USA and Canada)			
10:00 - 10:05	Conference Introduction and Review of Conference Logistics Dr. Claude Phipps, Photonic Associates		
10:05 - 10:45	KEYNOTE: High-Power Fiber Lasers in Directed Energy Applications Dr. Fabio Di Teodoro, Raytheon Technologies		
Panel: The Business Side of High Power Beam Applications Session Chair: Ms. Julie Mikula, NASA Ames Research Center		Time-Resolved Imaging and Probing of Ablation Plumes and Material Transformations Session Chair: Dr. Erik Brambrink, European XFEL	
10:45 - 10:50	Introductions	10:45 - 11:05	Surface Dynamics of Warm Dense Plasmas Upon High-Intensity Laser Irradiation Investigated by Grazing Incidence X-Ray Surface Scattering Dr. Motoaki Nakatsutsumi, European XFEL, GmbH
10:50 - 11:00	Peaceful Use of Lasers in Space Dr. Nikola Schmidt, Charles University	11:05 - 11:25	Laser Ablation Propulsion: New Advances in Investigating the Influence of Repetitive Ablation Dr. Séverine Boyer, MINES Paris PSL - CEMEF CNRS 7635
11:00 - 12:00	Panel Discussion with: - Jonathan Coopersmith, Texas A&M University, (Beamed Energy Commercialization Road Map) - Dr. Edl Schamiloglu, University of New Mexico (Identification of Technology Gaps and Best Methods for Inserting Game Changing Innovation) - Dr. John Lohr, DIII-D National Fusion (Applications) - Dr. Kevin Felch, Communications and Power Industries (Gyrotrons for High-Power Beam Applications) - Mr. Geoff Cushman, NASA Ames (High Power Lazer Facilities - Applications/Use/Facilities) - Ms. Julie Mikula, Mr. Seth Schisler, Mr. Todd Stinchfield, NASA Ames Research Center, O&A, DataBase, Next Steps	11:25 - 11:45	Ultrafast-Electron-Diffraction Experiments Reveal the Elastic-Plastic Strain Transition in Dynamically Compressed Al Dr. Mianzhen Mo, SLAC National Accelerator Laboratory
		11:45 - 12:05	Continuous Multi-Cycle Terahertz Measurements of the Electrical Conductivity of Free-Electron Laser Irradiated Warm Dense Gold Dr. Zhijiang Chen, SLAC National Accelerator Laboratory
12:00 - 12:05	Summary & Close		
12:05 - 12:35	Networking Roundtables		
12:35 - 12:40	Announcements & Keynote Introduction		
12:40 - 1:20	KEYNOTE: Harnessing Pulsed Laser Interactions and Ablation Plasmas for the Synthesis of Novel Nanomaterials Dr. David Geohegan, Oak Ridge National Laboratory		
Laser-Induced Modification of Material Microstructure and Surface Morphology Session Chair: Prof. Leonid Zhigilei, University of Virginia		High Power, Ultra-Short Pulse Lasers: Applications In Materials Science and Particle Acceleration Session Chair: Prof. Peter Herman, University of Toronto	
1:20 - 1:40	Laser Processing of Silicon Nanostructures for Optical Applications Dr. Costas Grigoropoulos, University of California, Berkeley	1:20 - 1:40	Laser-Wakefield Accelerators for High-Resolution X-Ray Imaging of Complex Microstructures Dr. Amina Hussein, University of Alberta
1:40 - 2:00	Influence of External Fields on the Energy Dissipation at the Initial Stage of Laser Ablation Prof. Bärbel Rethfeld, University of Kaiserslautern	1:40 - 2:00	Proton Acceleration and Creation of Warm, Dense Materials using High-Power Short-Pulse Lasers Dr. Christopher McGuffey, General Atomics
2:00 - 2:20	Additive Manufacturing of 3D Metallic Nano- and Microstructures Prof. Dr. Georg von Freymann, Technische Universitaet Kaiserslautern	2:00 - 2:20	High Field and High Energy Physics Studies Using High Power High Intensity Lasers Dr. Stepan Bulanov, Lawrence Berkeley National Laboratory
2:20 - 2:40	Femtosecond Laser Direct Nanostructuring of Ion Doped Porous Dielectric and Semiconductor Films: Mechanisms and Applications Dr. Tatiana Itina, CNRS	2:20 - 2:40	Development of a Terawatt Carbon Dioxide Laser Dr. Yu-hsin Chen, Naval Research Laboratory
2:40 - 3:00	Role of Inhomogeneous Absorption & Hydrodynamics in Ultrashort Laser-Induced Self-Organization Dr. Anton Rudenko, College of Optical Sciences	2:40 - 3:00	Simulations of Plasma Plume Expansion Induced by Irradiation of an Aluminum Target with Bursts of Short and Ultrashort Laser Pulses Dr. Alexey Volkov, University of Alabama
3:00 - 3:20	Subsurface Analysis of Grain Structure and Nanoparticle Layering of Micro/Nanostructures Formed on Metals Using Femtosecond Laser Surface Processing Dr. Craig Zuhlke, University of Nebraska - Lincoln	3:00 - 3:20	Volume Synthesis of Exotic Silicon Polymorphs by Laser Irradiation at Relativistic Intensity Prof. Andrei Rode, Australian National University
		POSTER: Laser-Assisted Selective Fabrication of Copper Traces on Polymers by Electroplating Mr. Vitalij Fiodorov, Center for Physical Sciences and Technology	
3:20 - 3:35	Break		
High-Power Lasers in Directed Energy Session Chair: Dr. Fabio Di Teodoro, Raytheon Technologies		Laser Induced Shock Applications Session Chair: Dr. Michael Boustie, CNRS	
3:35 - 3:55	Directed Energy - The Path to Radical Propulsion Advancement Prof. Philip Lubin, University of California, Santa Barbara	3:35 - 3:55	Real Delamination in Laminate Carbon Fiber Reinforced Polymer Produced by Laser Shock for Aeraonutic Structural Control Mrs. Marine Scius Bertrand, CEA
3:55 - 4:15	Coherent Beam Combining of 61 Femtosecond Fiber Amplifiers Dr. Jean-Christophe Chanteloup, École Polytechnique	3:55 - 4:15	Laser Shock Peening with Solid Confinement Mr. Corentin Le Bras, Airbus
4:15 - 4:35	Towards LSP Delivered by Fiber: Laser/Matter Interaction for Small Focal Spots Mr. Alexandre Rondepierre, Thales LAS France and PIMM (Arts et Métiers ParisTech)	4:15 - 4:35	Laser-Driven Detonation Wave in a Dielectric Film Prior to Ablation Dr. David Dunlap, University of New Mexico
4:35 - 4:55	Diode Pumped 5kW Monolithic CW Fiber Laser for Material Processing Applications Dr. Wei Shi, Tianjin University	4:35 - 4:55	Multi-Parabola Configuration for Improving Beam Riding Performance of Laser Propulsion Vehicle Dr. Masayuki Takahashi, Tohoku University
4:55 - 5:15	Reaction Modeling for Defense Applications: Case Studies Dr. Stephen Jimenez, Corvid Technologies	4:55 - 5:15	Efficient Drilling, Milling, and Polishing on Metals using Ultrashort Bursts and Bibursts Mr. Mantas Gaidys, Center for Physical Sciences and Technology (FTMC)

2021 High Power Laser Ablation Agenda

as of 4/8/2021

Thursday, 15 April 2021			
Times listed as Eastern Daylight Time (EDT) (USA and Canada)			
10:00 - 10:05	Conference Introduction and Review of Conference Logistics Dr. Claude Phipps, Photonic Associates		
10:05 - 10:45	KEYNOTE: Integrated Photonic Accelerators Driven by Ultrafast Laser Pulses Dr. R. Joel England, SLAC National Accelerator Laboratory		
Laser Ablation for PLD and MAPLE Session Chair: Dr. Enikő Gyorgy, CSIC-ICMAB		Laser-Enabled Scientific and Societal Applications Session Chair: Dr. Thierry Sarnet, CNRS	
10:45 - 11:05	Pulsed Laser Deposition of Functional Oxides Thin Films Prof. Maria Dinescu, National Institute for Laser, Plasma and Radiation Physics	10:45 - 11:05	Mechanisms of Generation of Laser-Induced Periodic Surface Structures on Si and Ge by Deep-UV Femtosecond Laser Pulses Dr. Vitaly Gruzdev, University of New Mexico
11:05 - 11:25	Nanohybrid Surface Layers Grown by Matrix Assisted Pulsed Laser Evaporation for Energy Storage Applications Dr. Enikő Gyorgy, CSIC-ICMAB	11:05 - 11:25	THEIA High Power, High Energy Diode-Pumped Solid State Laser for Industrial Applications Dr. Hervé Besaucele, THALES LAS FRANCE
11:25 - 11:45	Analysis of Multielemental Thin Films by Calibration-Free Laser-Induced Breakdown Spectroscopy Dr. Jörg Hermann, CNRS	11:25 - 11:45	High Power Laser System for ELI NP Mr. François Lureau, THALES LAS FRANCE
11:45 - 12:05	Structuring of Polystyrene Surface with Ultrashort Laser Pulses: Comparative Study from Ultraviolet to Near-Infrared Wavelengths Mr. Jan Hrabovsky, HiLASE Centre, Institute of Physics of the Czech Academy of Sciences	11:45 - 12:05	The HED Instrument at the European XFEL: Unique Capabilities to Study Material Properties of Laser-Compressed Matter Dr. Erik Brambrink, European XFEL
12:05 - 12:35	Networking Roundtables		
Beamed Energy Propulsion and Thermal Coupling in Laser and Microwave Propulsion Problems Session Chair: Prof. Hideyuki Horisawa, Tokai University and Dr. Stefan Scharring, German Aerospace Center		continuation of Laser-Enabled Scientific and Societal Applications	
12:35 - 12:55	Laser Propulsion for Space Debris Recycling Dr. Egor Loktionov, Bauman Moscow State Technical University	12:35 - 12:55	Near Perfect Hemispherical Emissivity Produced Using Femtosecond Laser Surface Processing Mr. Andrew Reicks, University of Nebraska- Lincoln
12:55 - 1:15	Thrust Efficiency Across the Phase-Explosion Threshold in Laser Ablation Propulsion Dr. Jacopo Terragni, University of Trento	12:55 - 1:15	Dynamic Sheath Formation and sub-THz Radiation Emission from Laser-Metal Interactions Dr. Asher Davidson, Naval Research Laboratory, Plasma Physics Division
1:15 - 1:35	Laser Ablation with Ultra-Short Double Pulses – Effects of Shielding, Re-Deposition and their Impact on Space Propulsion Systems Mr. Daniel Förster, University of Stuttgart	1:15 - 1:35	Evaluation of Surface Processing Efficiency with Powerful Pulsed Lasers for Large-Scale Real-World Industrial Applications Prof. Andrei Rode, Australian National University
		Lasers in Additive Manufacturing Session Chair: Prof. Ji Ma, University of Virginia	
1:35 - 1:55	Review: Multiple Pulse Coupling on Metal and Plastic Targets at 6 and 70ps Dr. Claude Phipps, Photonic Associates	1:35 - 1:55	Modelling of Dielectric Material Structuring using Train of Spatially Chirped Femtosecond Laser Pulses Mr. Paul Quinoman, CELIA
1:55 - 2:15	Control and Stability of Laser/Microwave-Propelled Sails Dr. Edl Schamiloglu, University of New Mexico	1:55 - 2:15	Unusual Strain Relaxation Mechanism in Metastable β Ti-Nb Alloy after Laser Melting Mr. Wenhao Lin, University of Virginia, Department of Material Science and Engineering
2:15 - 2:35	The Influence of Surface Roughness and Irradiance on Thermal Coupling for Aluminum Space Debris Removal Dr. John Sinko, St. Cloud State University	2:15 - 2:35	A Novel Mechanism of Metal Spattering During High-Power Laser Processing Prof. Tao Sun, University of Virginia
2:35 - 2:50	Break		
2:50 - 2:55	Announcements & Keynote Introduction		
2:55 - 3:35	KEYNOTE: Laser Systems for Precise Orbit Measurement and Traffic Management of LEO Debris Mr. Christophe Bonnal, CNES		
continuation of Beamed Energy Propulsion and Thermal Coupling in Laser and Microwave Propulsion Problems		Laser Systems for Precise Orbit Measurement and Traffic Management of LEO Debris Session Chair: Dr. Richard Haglund, Vanderbilt University	
3:35 - 3:55	Thrust Generation through Interaction of Ultraviolet Light-Emitting Diodes and Solid Polymers for Space Propulsion Applications Prof. Hideyuki Horisawa, Tokai University	3:35 - 3:55	Conceptual Study on Laser Networks for Near-Term Collision Avoidance for Space Debris in the Low Earth Orbit Dr. Stefan Scharring, German Aerospace Center
3:55 - 4:15	Molecular Dynamics Analysis for Laser Ablation Propulsion Using Graphite Dr. Naofumi Ohnishi, Tohoku University	3:55 - 4:15	High-Efficiency Optical Limiter in the Near-Infrared Based on a Phase-Changing Metasurface Dr. Richard Haglund, Vanderbilt University
4:15 - 4:35	Proposal and Simulation of Microwave-Driven In-Tube Accelerator Dr. Masayuki Takahashi, Tohoku University	4:15 - 4:35	Air and Vacuum Impulse Measurements at 1064nm for Laser Remediation of Aluminum Space Debris Dr. John Sinko, St. Cloud State University