

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

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INTERNATIONAL HIGH POWER LASER ABLATION

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

Wednesday, 14 April 2021

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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, Q&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	

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INTERNATIONAL HIGH POWER LASER ABLATION

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
3:20 - 3:35		POSTER: Laser-Assisted Selective Fabrication of Copper Traces on Polymers by Electroplating Mr. Vitalij Fiodorov, Center for Physical Sciences and Technology	
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 Aeraunotic 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)

Thursday, 15 April 2021			
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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		
12:35 - 12:55	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	<i>continuation of Laser-Enabled Scientific and Societal Applications</i>	
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

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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		
<i>continuation of</i> 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