

TECHNICAL
PROGRAM

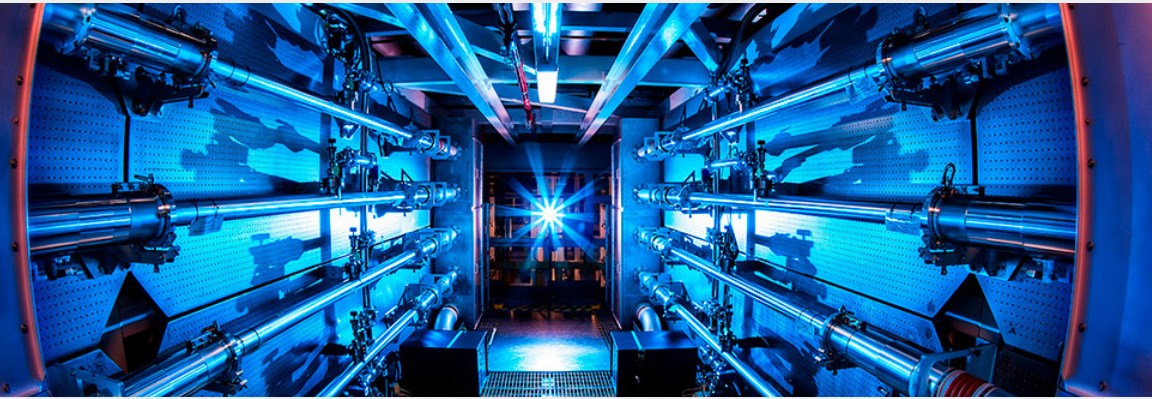
SPIE. LASER DAMAGE

17-20 September 2023

Holiday Inn, Dublin-Pleasanton
Dublin/Livermore, California, USA

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#SPIELaserDamage





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Welcome to the 55th Annual Laser Damage Symposium

Get ready to enjoy real conversations, discussing the latest breakthroughs on the physics and technologies of materials for high-power, high-energy lasers. Attend technical events, poster sessions, and a variety of networking activities for learning and professional advancement opportunities.

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(USA)



Detlev Ristau
Laser Zentrum
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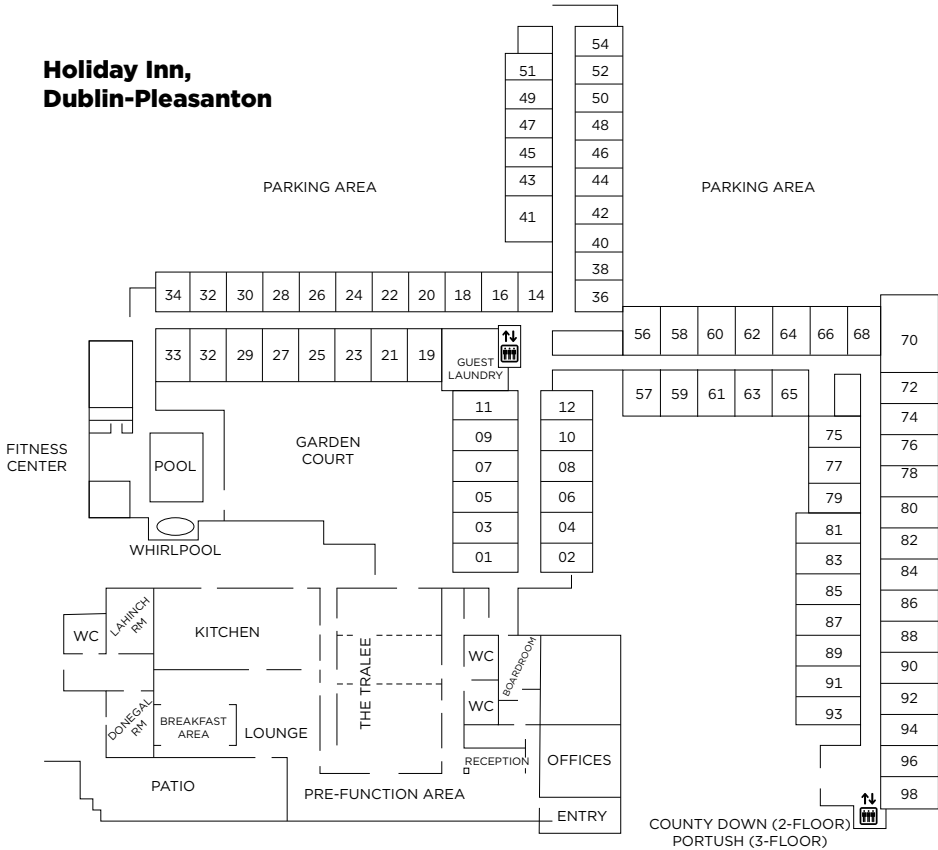
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LASER DAMAGE CHAIR EMERITUS

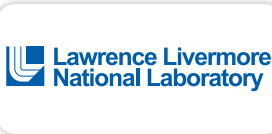


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THANK YOU TO THESE 2023 CONFERENCE AND SPECIAL EVENT SPONSORS



Technical events

Connect with your colleagues and explore topics in depth. Events include Sunday tutorial, poster sessions, and the results of the laser damage competition.

SUNDAY TUTORIAL:

The NIF Laser Ignition Driver

17 September 2023 • 6:00 PM - 7:00 PM

Tralee Ballroom

Join Laser Damage attendees for a Tutorial and Discussion chaired by Mary Spaeth and Kenneth Manes.

POSTER SLAMS:

Thin Films + Surfaces, Mirrors, and Contamination

19 September 2023 • 1:10 PM - 1:55 PM

Tralee Ballroom

Join the poster presenters of the Thin Films and Surfaces, Mirrors, and Contamination session for their two-minute oral slams prior to the poster session.

12726-52 • **Low absorption subwavelength structures for high power UV laser applications**, Anne Gärtner, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Friedrich-Schiller-Univ. Jena (Germany); Christian Mühlig, Ulrike Schulz, Astrid Bingel, Hanjörg Wagner, Sven Schröder, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Friedrich-Schiller-Univ. Jena (Germany)

12726-53 • **2D chalcogenide thin films for super-resolved laser inscriptions**, Arjun Karimbana-Kandy, Julien Lumeau, Jean-Yves Natoli, Konstantinos Iliopoulos, Institut Fresnel, Aix Marseille Univ., Centrale Marseille, CNRS (France)

12726-54 • **Measurement of optical coatings absorption at 1570 nm and simulations of photo-induced modifications of spectral function under high power CW laser exposition**, Mathias Soulier, Hélène Krol, CILAS (France); Mathieu Boutillier, Ctr. National d'Études Spatiales (France); Emilie Steck, Airbus (France); Julien Lumeau, Laurent Gallais-During, Institut Fresnel (France)

12726-55 • **Laser damage to photo and rubbed liquid crystal alignment materials**, Zoey S. Davidson, Seurat Technologies (USA); Jason U. Wallace, Univ. of Rochester (USA), D'Youville Univ. (USA); Yasaman Sargol Zaei Aval, Seurat Technologies (USA); Nathaniel D. Urban, Stavros G. Demos, Kenneth L. Marshall, Univ. of Rochester (USA); Selim Elhadj, Seurat Technologies (USA)

12726-56 • **Influence of impurities on the laser damage resistance and properties of ion beam sputtered films**, David Howe, Antonio Checco, Matthias Falmbigl, Jason George, Binyamin Rubin, Veeco Instruments Inc. (USA)

12726-57 • **Short pulse laser damage of HfO₂/SiO₂ antireflection coatings at 1030 nm wavelength**, Samuel Castro Lucas, Maxwell Weiss, Carmen S. Menoni, Colorado State Univ. (USA); Mohamed Yaseen Noor, Emma DeAngelis, Gulsum Salman, Aamir Mushtaq, Enam A. Chowdhury, The Ohio State Univ. (USA); Egidijus Pupka, Austeja Aleksiejute, Justinas Galinis, LIDARIS Ltd. (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania)

12726-58 • **Correlation of coating stress and LIDT**, Tarik Kellermann, Heinrich Mädebach, Morten Steinecke, Laser Zentrum Hannover e.V. (Germany); Marco Jupé, Andreas Wienke, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)

12726-59 • **Comprehensive optical loss characterization of ultra-high reflecting mirror: energy balance measurements**, Christian Mühlig, Tobias Herfurth, Simon Bublitz, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)

12726-61 • **Exploring self-healing liquid metal mirrors for high-power laser applications**, Marcela Ramirez Mireles, Univ. of Rochester (USA)

12726-62 • **Contamination examination using laser damage morphology on fused silica polished with magnetic field-assisted finishing**, Julian Long, Univ. of Florida (USA); Yuya Tsunozuka, Motoya Kurosaki, Tomosumi Kamimura, Ryohei Yasukuni, Osaka Institute of Technology (Japan); Hitomi Yamaguchi, Univ. of Florida (USA)

12726-63 • **Enhancement of laser-induced damage threshold for YAG crystals via plasma etching**, Alexandr Belosludtsev, Ctr. for Physical Sciences and Technology (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania); Giedrius Abromavičius, Ctr. for Physical Sciences and Technology (Lithuania)

12726-64 • **Ellipsometric measurements of laser induced changes in high reflectivity mirrors**, Tomas Tolenis, ELI ERIC (Czech Republic); Lukas Ramalis, Ctr. for Physical Sciences and Technology (Lithuania); Saul Miranda Vasquez, Mojmir Havlik, Irena Havlíčková, Adrien Chauvin, Bedrich Rus, Shirly Josefina Espinoza Herrera, Daniel Kramer, ELI ERIC (Czech Republic)

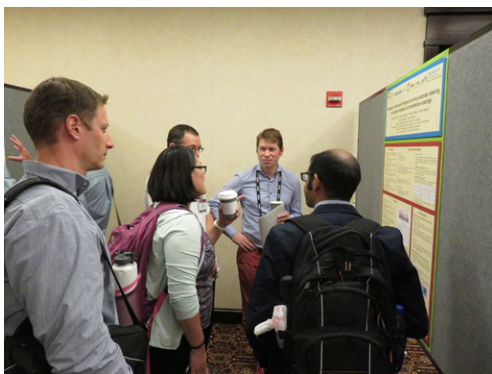
12726-65 • **Optimizing fused silica debris shield use to extend grating debris shield lifetime**, Ernest J. Truscott, Rajesh N. Raman, Christopher F. Miller, Ryan M. Gini, Zhi M. Liao, C. W. Carr, Lawrence Livermore National Lab. (USA)

12726-66 • **Development of mixed materials to improve the laser-induced damage threshold of multilayer dielectric mirrors for petawatt class lasers**, Océane Aubard, Marine Chovel, Eric Lavastre, Corinne Marcel, CEA (France)

12726-67 • **Maximizing the signal in nonlinear beam-deflection technique**, Sanaz Faryadras, David Hagan, Eric Van Stryland, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)

12726-88 • **Diffraction gratings for high-energy-laser (HEL) systems**, Ryan Semple, Dale Smith, Claire Smith, Turan Erdogan, Doug Smith, Plymouth Grating Lab. (USA)

See full details and updates at spie.org/ld or on the **SPIE App**



POSTER SESSION:

Thin Films + Surfaces, Mirrors, and Contamination

19 September 2023 • 1:55 PM - 2:55 PM
Garden Courtyard

Conference attendees are invited to attend the Tuesday afternoon poster session outdoors in the courtyard. Enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Tuesday 7:30 AM - 10:00 AM

Poster authors, view poster presentation guidelines and set-up instructions online.

POSTER SLAMS:

Measurement and Materials + Fundamental Mechanisms

20 September 2023 • 1:30 PM - 2:15 PM
Tralee Ballroom

Join the poster presenters of the Measurement and Materials and Fundamental Mechanisms session for their two-minute oral slams prior to the poster session.

12726-69 • Combined molecular and metallic particulate laser-induced contamination testing: De-risking activity for the LISA space mission, Moritz . Vogel, Nils Bartels, Wolfgang Riede, Thomas Klumpp, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Christian Dahl, Kai-Christian Voss, SpaceTech GmbH (Germany); Alessandra Ciapponi, European Space Research and Technology Ctr. (Netherlands); Ricardo Martins, European Space Agency (Netherlands); Linda Mondin, European Space Agency (Netherlands)

12726-70 • Temporally and spatially resolved photoluminescence of laser-induced damage sites of fused silica, Jae Hyuck Yoo, Yoonsoo Rho, Christopher F. Miller, Robin E. Yancey, Ted A. Lawrence, C. W. Carr, Lawrence Livermore National Lab. (USA)

12726-72 • High laser damage threshold coating methods and materials for planarized index-matching of freeform polarization-smoothing optics, Nathaniel D. Urban, Jenny Zhao, John A. Marozas, Kenneth L. Marshall, Stavros G. Demos, Univ. of Rochester (USA)

12726-74 • Laser damage surface morphology and dynamics with ultrafast scanning tunneling microscopy (STM), Zhihan Li, The Ohio State Univ. (USA)

12726-75 • Temperature and damage behavior of hybrid coated mirrors under continuous wave laser irradiation, Kevin Kiedrowski, Morten Steinecke, Laser Zentrum Hannover e.V. (Germany); Henrik Ehlers, Michael Kennedy, LASEROPTIK GmbH (Germany); Marco Jupé, Andreas Wienke, Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany); Detlev Ristau, Institute of Quantum Optics, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)

12726-76 • Laser-induced damage analysis of PMMA optical fibers using raytracing simulations and x-ray tomography, Kevin Kiedrowski, Laser Zentrum Hannover e.V. (Germany); Mario Ferraro, Sapienza Univ. di Roma (Italy), Univ. della Calabria (Italy); Raphaël Jauberteau, Stefan Wabnitz, Sapienza Univ. di Roma (Italy); Maria Caterina Crocco, Vincenzo Formoso, Univ. della Calabria (Italy), STAR Research Infrastructure (Italy); Marco Jupé, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany); Detlev Ristau, Institute of Quantum Optics, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)

12726-77 • Energy and power upgrade on LMJ: Approach & tools to estimate damage statistics and identify mechanisms, Chloé Lacombe, Laurent Lamaignère, Kévin Gaudfrin, Florian Gaudfrin, Thierry Donval, Vincent Beau, Jérôme Néauport, CEA-Cesta (France)

12726-78 • Glass ablation and cutting with a femtosecond Bessel beam, Conrad Kuz, Justin Twardowski, Mohamed Yaseen Noor, Emma DeAngelis, Enam A. Chowdhury, The Ohio State Univ. (USA)

12726-79 • Theory for ionization of dielectrics with a circularly polarized laser beam, Rachel Nuter, CEA-Cesta (France)

12726-81 • Target current and spatial modulations analysis for LIDT measurements using fs laser irradiation, Gabriel Petrisor Bleotu, Extreme Light Infrastructure Nuclear Physics (Romania), Univ. din Bucuresti (Romania), Ecole Polytechnique (France); Stefan Irimiciuc, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Alice Dumitru, Dan G. Matei, Extreme Light Infrastructure Nuclear Physics (Romania); Radu Udrea, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Univ. Politehnica din Bucuresti (Romania); Doina Craciun, Ioan Dancus, Valentin Craciun, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Daniel Ursescu, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Univ. din Bucuresti (Romania)

12726-82 • MELBA: A testbed to study the impact of pulse characteristics on laser-induced damage in UV range and nanosecond regime, Sylvain Grosjean, Martin Cormier, Jean-François Gleyze, Nadja Roquin, CEA-Cesta (France); Jean-Yves Natoli, Institut Fresnel (France); Laurent Lamaignère, CEA-Cesta (France)

12726-83 • Shockwave and crack monitoring following nonlinear absorption with picosecond time-resolved microscopic imaging, Matthew R. Ross, Corning Incorporated (USA)

12726-84 • Comparison of fatigue laser-induced damage of HfO₂ & SiO₂ mixture coating and commercial grade standard UV mirrors operating in fs-pulse regime, Laurynas Lukoševičius, Justinas Butkus, Deividas Buinovskis, Altechna UAB (Lithuania)

12726-85 • **Optical components applying quantized nanolaminates for NIR applications**, Marco Jupé, Cassian Bergmann, Morten Steinecke, Andreas Wienke, Laser Zentrum Hannover e.V. (Germany)

12726-87 • **Continuous wave laser induced damage threshold of Germanium windows at 1.07 microns**, John E. McElhenny, DEVCOM U.S. Army Research Lab (USA)

POSTER SESSION:

Measurement and Materials + Fundamental Mechanisms

20 September 2023 • 2:15 PM - 3:15 PM
Garden Courtyard

Conference attendees are invited to attend the Wednesday afternoon poster session outdoors in the courtyard. Enjoy light refreshments, ask questions, and network with colleagues in your field.

Poster Setup: Wednesday 7:30 AM-10:00 AM

Poster authors, view poster presentation guidelines and set-up instructions online.

Social and networking events

These interactive sessions give you the opportunity to network, learn, and discuss your work with professionals from around the world

Welcome and Social Mixer

17 September 2023 • 7:00 PM - 8:30 PM
Ballyunion Bar & Grill

Join your colleagues for light refreshments and mingling on the opening day of the meeting.

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LUMINATE

National Ignition Facility Tours

18 September 2023 • 11:40 AM - 4:30 PM
Lawrence Livermore National Laboratory

Virtual and in-person tours will take place during the extended lunch break on Monday 18 September.

The virtual tour with an in-person host will be available to all attendees in the main conference room 1:00 PM-2:30 PM

In-person tours require advanced signup and will be held 11:40 AM-4:30 PM (including transportation time).

Groups will tour the following labs of the National Ignition Facility:

- NIF Laser Facility and Target Chamber
- NIF Optics Processing Facility
- NIF Optics Mitigation Facility

The pre-authorized tour group is now full, and registration for the in-person tour is closed.



Wine and Cheese Tasting Reception

19 September 2023 • 6:30 PM - 8:00 PM
Garden Courtyard

Meet with colleagues to unwind on Tuesday evening in the Garden Courtyard. This is your opportunity to sample local beer and wine, along with a variety of domestic and aged cheeses and hors d'oeuvres. Included with conference registration. Guest tickets available for \$50.

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Technical Conference

Sunday 17 September	
6:00 PM - 7:00 PM	SUNDAY TUTORIAL The NIF laser ignition driver: development from 1960 to 2023 Mary L. Spaeth , Lawrence Livermore National Lab. (USA); Kenneth R. Manes , Lawrence Livermore National Lab. (USA)
Monday 18 September	
8:00 AM - 8:20 AM	Opening Remarks and Awards Welcome and presentation of Laser Damage 2022 awards. Michael D. Thomas , Spica Technologies, Inc. (USA)
8:20 AM - 11:40 AM	SESSION 1: MINI-SYMPOSIUM I: ICF ENABLING TECHNOLOGIES Session Chairs: Raluca A. Negres , Lawrence Livermore National Lab. (USA), M.J. Soileau , CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)
8:20 AM - 8:50 AM	12726-1 • Keynote Presentation A review of fusion enabling laser-induced damage reduction, management, and repair strategies on at the National Ignition Facility , C. W. Carr, Lawrence Livermore National Lab. (USA)
8:50 AM - 9:20 AM	12726-2 • Invited Paper Optic technologies enabling fusion ignition at the National Ignition Facility. Tayyab I. Suratwala, Lawrence Livermore National Lab. (USA)
9:20 AM - 9:40 AM	12726-3 • Laser-matter-interactions in switching spatial light modulator multilayer device structures for high power applications , Selim Elhadj, Zoey S. Davidson, Yasaman Sargol, Sanam Nahaei, Seurat Technologies (USA)
9:40 AM - 10:00 AM	Coffee Break
10:00 AM - 10:20 AM	12726-4 • Stimulated Brillouin scattering induced by a temporal modulated nanosecond UV laser beam , Rachel Nuter, Charles Bouyer, Jean-François Gleyze, Nadja Roquin, Laurent Lamaignère, CEA-Cesta (France)
10:20 AM - 10:40 AM	12726-5 • Preparations for THG operations at 2.2 MJ and beyond , Kathleen I. Schaffers, Christopher J. Stolz, John J. Adams, Raluca A. Negres, Marcus V. Monticelli, Lawrence Livermore National Lab. (USA)
10:40 AM - 11:10 AM	12726-6 • Invited Paper Breakthroughs at the National Ignition Facility: Targets for ignition , Salmaan H. Baxamusa, Lawrence Livermore National Lab. (USA)
11:10 AM - 11:40 AM	12726-7 • Invited Paper Lawrence Livermore National Ignition Facility: Present and future laser performance enabling fusion ignition experiments , Lawrence Pelz, Lawrence Livermore National Lab. (USA)
11:40 AM - 4:30 PM	Lunch Break and NIF Tours
1:00 PM - 2:30 PM	Virtual NIF Tour , Hosted by in person tour guide Laura Kegelmeyer , Lawrence Livermore National Lab. (USA) Take a virtual tour of the National Ignition Facility labs from the main conference room.
4:30 PM - 4:50 PM	Coffee Break
4:50 PM - 6:10 PM	SESSION 2: THIN FILMS I Session Chairs: Selim Elhadj , Seurat Technologies (USA), Christopher J. Stolz , Lawrence Livermore National Lab. (USA)
4:50 PM - 5:10 PM	12726-9 • Sapphire optics for contamination resistance and extreme power density applications , Adam Argondizzo, Samuel Zilavy, Kyle Branigan, Coherent Corp. (USA)
5:10 PM - 5:30 PM	12726-10 • Study of high-performance IBS coatings for near-IR laser applications. Alex Ribeaud, Jürgen Pistner, Bühler Alzenau GmbH (Germany); Mathias Soulier, Laurent Gallais-During, Julien Lumeau, Institut Fresnel (France); Heidi Thomé, Christoph Sturzenegger, RhySearch (Switzerland); Bernd Eiermann, WZW-Optic AG (Switzerland); Christian Mühligh, Thomas Gischkat, Sven Schröder, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)
5:30 PM - 5:50 PM	12726-12 • Study of beam diameter and test area effect on laser-induced damage threshold measurements in the nanosecond regime , Matthew S. Dabney, Brian Arnold, Cyrus Rashvand, Edmund Optics Inc. (USA)
5:50 PM - 6:10 PM	12726-11 • Optical properties of (TiO₂:Ta₂O₅) composite coatings by ion beam sputtering , Xiaochuan Ji, Dianhao Dong, Jinlong Zhang, Hongfei Jiao, Bin Ma, Tongji Univ. (China)

Technical Conference

6:10 PM - 6:40 PM	SESSION 3: LASER DAMAGE COMPETITION Session Chairs: Selim Elhadj , Seurat Technologies (USA); Christopher J. Stolz , Lawrence Livermore National Lab. (USA)
6:10 PM - 6:40 PM	12726-8 • Broadband, 920-nm mirror thin film damage competition (<i>Invited Paper</i>), Raluca A. Negres, Lawrence Livermore National Lab. (USA); Kyle P. Kafka, Stavros G. Demos, Univ. of Rochester (USA)
6:40 PM - 6:50 PM	Closing Remarks, Christopher Stolz , Lawrence Livermore National Lab. (USA)
Tuesday 19 September	
6:30 PM - 7:00 PM	SESSION 4: THIN FILMS II Session Chairs: Lars O. Jensen , TRUMPF SE + Co. KG (Germany); Steven T. Yang , SLAC National Accelerator Lab. (USA)
8:00 AM - 8:30 AM	12726-14 • (Keynote Presentation) Atomic layer deposition: a novel coating process for laser applications , Morten Steinecke, Laser Zentrum Hannover e.V. (Germany)
8:30 AM - 8:50 AM	12726-15 • Influence of the multilayer dielectric design on the laser damage resistance of pulse-compression gratings , Saaxewer B. Diop, CEA-Cesta (France), Institut Fresnel (France), Lawrence Livermore National Lab. (USA); Nicolas Bonod, Institut Fresnel (France); Marine Chorel, Eric Lavastre, Nadja Roquin, Lilian Heymans, CEA-Cesta (France); Pierre Brianceau, CEA-Grenoble (France); Laurent Gallais-During, Institut Fresnel (France); Laurent Lemaignère, CEA-Cesta (France)
8:50 AM - 9:10 AM	12726-16 • Development of viscoelastic thin films to mitigate shock wave-induced laser damage in high power laser systems , Amira Guediche, CEA-Le Ripault (France); Laurent Belliard, Institut des nanosciences de Paris, Sorbonne Univ. (France); Bernard Perrin, Institut des nanosciences de Paris, Sorbonne Univ. (France); Marc Duquennoy, Univ. Polytechnique Hauts-de-France (France); Amandine Moïny, Mathieu Lafarie, CEA-Le Ripault (France); Michel Boustie, PPRIME Institute, Univ. de Poitiers (France); Emilien Lescoute, CEA-DAM Ile-de-France (France); Philippe Belleville, Hervé Piombini, CEA-Le Ripault (France)
9:10 AM - 9:30 AM	12726-17 • Femtosecond damage threshold of dispersive mirrors produced with magnetron sputtering , Volodymyr Pervak, Ludwig-Maximilians-Univ. München (Germany)
9:30 AM - 9:50 AM	12726-18 • Laser-induced damage of dielectric-enhanced surface-modified single-point-diamond-turned Al-6061 multiband mirrors , Jue Wang, Corning Incorporated (USA)
9:50 AM - 10:20 AM	Coffee Break
10:20 AM - 12:10 PM	SESSION 5: SURFACES, MIRRORS, AND CONTAMINATION I Session Chairs: Michael D. Thomas , Spica Technologies, Inc. (USA); Enam A. Chowdhury , The Ohio State Univ. (USA)
10:20 AM - 10:50 AM	12726-19 • (Keynote Presentation) High power optics in the semiconductor industry , Adriaan van Zwol, ASML Netherlands B.V. (Netherlands)
10:50 AM - 11:10 AM	12726-20 • Exploring nonlinear effects of laser irradiation on single- and multi-layer dielectric coatings: a study on HfO₂, ZrO₂, and Al₂O₃ coatings , Erikas Atkocaitis, Martynas Keršys, Vilnius Univ. (Lithuania); Simonas Kicas, Vaida Grasyte, OPTOMAN (Lithuania); Justinas Galinis, Austėja Aleksiejute, LIDARIS Ltd. (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania), LIDARIS Ltd. (Lithuania)
11:10 AM - 11:30 AM	12726-21 • Pulse duration dependence of single-shot pulsed laser ablation of gallium based III-V compound semiconductors , Marnix Vreugdenhil, Dries van Oosten, Utrecht Univ. (Netherlands)
11:30 AM - 11:50 AM	12726-22 • Three-dimensional finite-difference time-domain study of enhanced field effects caused by debris and damage sites of multilayer diffraction gratings , Hu Huang, Stavros G. Demos, Univ. of Rochester (USA)
11:50 AM - 12:10 PM	12726-23 • Observation and mitigation of sub-damage threshold UV laser-induced contamination on optical surfaces at 355 nm , Lucas Willis, Brian Arnold, Cyrus Rashvand, Matthew S. Dabney, Edmund Optics Inc. (USA)
12:10 PM - 1:10 PM	Lunch Break

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1:10 PM - 1:55 PM	POSTER SLAMS: THIN FILMS + SURFACES, MIRRORS, AND CONTAMINATION Session Chairs: C. W. Carr , Lawrence Livermore National Lab. (USA), Michael D. Thomas , Spica Technologies, Inc. (USA)
1:55 PM - 2:55 PM	POSTER SESSION: THIN FILMS + SURFACES, MIRRORS, AND CONTAMINATION
	12726-52 • Low absorption subwavelength structures for high power UV laser applications , Anne Gärtner, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Friedrich-Schiller-Univ. Jena (Germany); Christian Mühlig, Ulrike Schulz, Astrid Bingel, Hanjörg Wagner, Sven Schröder, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany); Andreas Tünnermann, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany), Friedrich-Schiller-Univ. Jena (Germany)
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	12726-54 • Measurement of optical coatings absorption at 1570 nm and simulations of photo-induced modifications of spectral function under high power CW laser exposition , Mathias Soulier, Hélène Krol, CILAS (France); Mathieu Boutillier, Ctr. National d'Études Spatiales (France); Emilie Steck, Airbus Defence and Space (France); Julien Lumeau, Laurent Gallais-During, Institut Fresnel (France)
	12726-55 • Laser damage to photo and rubbed liquid crystal alignment materials , Zoey S. Davidson, Seurat Technologies (USA); Jason U. Wallace, Univ. of Rochester (USA), D'Youville Univ. (USA); Yasaman Sargol Zaei Aval, Seurat Technologies (USA); Nathaniel D. Urban, Stavros G. Demos, Kenneth L. Marshall, Univ. of Rochester (USA); Selim Elhadj, Seurat Technologies (USA)
	12726-56 • Influence of impurities on the laser damage resistance and properties of ion beam sputtered films , David Howe, Antonio Checco, Matthias Falmbigl, Jason George, Binyamin Rubin, Veeco Instruments Inc. (USA)
	12726-57 • Short pulse laser damage of HfO₂/SiO₂ antireflection coatings at 1030 nm wavelength , Samuel Castro Lucas, Maxwell Weiss, Carmen S. Menoni, Colorado State Univ. (USA); Mohamed Yaseen Noor, Emma DeAngelis, Gulsum Salman, Aamir Mushtaq, Enam A. Chowdhury, The Ohio State Univ. (USA); Egidijus Pupka, Austėja Aleksiejute, Justinas Galinis, LIDARIS Ltd. (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania)
	12726-58 • Correlation of coating stress and LIDT , Tarik Kellermann, Heinrich Mädebach, Morten Steinecke, Laser Zentrum Hannover e.V. (Germany); Marco Jupé, Andreas Wienke, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)
	12726-59 • Comprehensive optical loss characterization of ultra-high reflecting mirror: energy balance measurements , Christian Mühlig, Tobias Herffurth, Simon Bublitz, Fraunhofer-Institut für Angewandte Optik und Feinmechanik IOF (Germany)
	12726-61 • Exploring self-healing liquid metal mirrors for high-power laser applications , Gregory S. Demos, Brittany N. Hoffman, Marcela Mireles Ramirez, Univ. of Rochester (USA)
	12726-62 • Contamination examination using laser damage morphology on fused silica polished with magnetic field-assisted finishing , Julian Long, Univ. of Florida (USA); Yuya Tsunozuka, Motoya Kurosaki, Tomosumi Kamimura, Ryohei Yasukuni, Osaka Institute of Technology (Japan); Hitomi Yamaguchi, Univ. of Florida (USA)
	12726-63 • Enhancement of laser-induced damage threshold for YAG crystals via plasma etching , Alexandr Belosludtsev, Ctr. for Physical Sciences and Technology (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania); Giedrius Abromavičius, Ctr. for Physical Sciences and Technology (Lithuania)
	12726-64 • Ellipsometric measurements of laser induced changes in high reflectivity mirrors , Tomas Tolenis, ELI ERIC (Czech Republic); Lukas Ramalis, Ctr. for Physical Sciences and Technology (Lithuania); Saul Miranda Vasquez, Mojmír Havlík, Irena Havlíčková, Adrien Chauvin, Bedrich Rus, Shirly Josefina Espinoza Harrera, Daniel Kramer, ELI ERIC (Czech Republic)
	12726-65 • Optimizing fused silica debris shield use to extend grating debris shield lifetime , Ernest J. Truscott, Rajesh N. Raman, Christopher F. Miller, Ryan M. Gini, Zhi M. Liao, C. W. Carr, Lawrence Livermore National Lab. (USA)
	12726-66 • Development of mixed materials to improve the laser-induced damage threshold of multilayer dielectric mirrors for petawatt class lasers , Océane Aubard, Marine Chorel, Eric Lavastre, Corinne Marcel, CEA (France)
	12726-67 • Maximizing the signal in nonlinear beam-deflection technique , Sanaz Faryadras, David Hagan, Eric Van Stryland, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)
	12726-88 • Diffraction gratings for high-energy-laser (HEL) systems , Ryan Semple, Dale Smith, Claire Smith, Turan Erdogan, Doug Smith, Plymouth Grating Lab. (USA)

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2:55 PM - 4:45 PM	SESSION 6: SURFACES, MIRRORS, AND CONTAMINATION II Session Chairs: Ted A. Laurence , Lawrence Livermore National Lab. (USA); Laurent Lamaignère , CEA-Cesta (France)
2:55 PM - 3:25 PM	12726-24 • Invited Paper Optical damage considerations in the design of the Matter in Extreme Condition Upgrade (MEC-U) laser system , Steven T. Yang, Michael R. Greenberg, Eric Cunningham, Mikael D. Martinez, SLAC National Accelerator Lab. (USA); Raluca A. Negres, Colin Harthcock, Thomas M. Spinka, Lawrence Livermore National Lab. (USA); Amy L. Rigatti, Stavros G. Demos, Elizabeth Hill, Univ. of Rochester (USA)
3:25 PM - 3:45 PM	12726-25 • Monolayer organic thin films as particle-contamination-resistant coatings , Ruobin Jia, Brittany N. Hoffman, Alexei A. Kozlov, Stavros G. Demos, Alexander A. Shestopalov, Univ. of Rochester (USA)
3:45 PM - 4:05 PM	12726-26 • Repair strategies for fused silica wedged focus lens with high density filamentary damage , Keturah Palma, Rajesh N. Raman, Christopher F. Miller, Scott Trummer, David A. Cross, C. W. Carr, Lawrence Livermore National Lab. (USA)
4:05 PM - 4:25 PM	12726-27 • Investigation of the impact of defects in etched fused silica on laser damage to improve the performance of pulse-compression gratings , Russell S. Dent, Hu Huang, Alexei A. Kozlov, Amy L. Rigatti, Alexander A. Shestopalov, Stavros G. Demos, Univ. of Rochester (USA)
4:25 PM - 4:45 PM	12726-28 • An overview on laser damage performance of current AR-coated windows at 343 nm and ultrashort pulses , Jan Vanda, Mihai-George Muresan, Martin Mydlar, Hana Turcicova, Jan Brajer, Tomas Mocek, Institute of Physics of the CAS, v.v.i. (Czech Republic)
4:45 PM - 5:15 PM	Coffee Break
5:15 PM - 6:15 PM	SESSION 7: FUNDAMENTAL MECHANISMS I Session Chairs: Stavros G. Demos , Univ. of Rochester (USA); Meiping Zhu , Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China)
5:15 PM - 5:35 PM	12726-29 • Potential implications of environmental effects of ps and ns laser-induced damage for damage initiation mechanisms , Ted A. Laurence, C. W. Carr, Eyal Feigenbaum, Sonny Ly, Raluca A. Negres, Lawrence Livermore National Lab. (USA)
5:35 PM - 5:55 PM	12726-30 • Ultrafast laser damage on SiO₂/HfO₂ multilayer dielectric mirrors reveals amorphous to crystalline phase transformation , Mohamed Yaseen Noor, Simin Zhang, The Ohio State Univ. (USA); Aaron Davenport, Carmen S. Menoni, Colorado State Univ. (USA); Enam A. Chowdhury, The Ohio State Univ. (USA)
5:55 PM - 6:15 PM	12726-31 • Impact of micron scale periodic fluence variation on laser damage , Isaac L. Bass, Eyal Feigenbaum, Saaxewer B. Diop, James L. Vickers, Gabriel Guss, C. W. Carr, Lawrence Livermore National Lab. (USA)
6:15 PM - 6:25 PM	Closing Remarks
Wednesday 20 September	
8:00 AM - 10:30 AM	SESSION 8: MINI-SYMPOSIUM II: MIXED MATERIALS/NANO-LAMINATES Session Chairs: Marco Jupé , Laser Zentrum Hannover e.V. (Germany); Carmen S. Menoni , Colorado State Univ. (USA)
8:00 AM - 8:30 AM	12726-32 • Invited Paper Amorphous oxide mixtures and nanolaminates for coatings of gravitational wave detectors , Carmen S. Menoni, Colorado State Univ. (USA)
8:30 AM - 9:00 AM	12726-33 • Invited Paper Dielectric quantized nanolaminates for laser optics , Thomas Willemsen, LASEROPTIK GmbH (Germany)
9:00 AM - 9:30 AM	12726-34 • Invited Paper Mixture optical coatings for applications in high power laser systems , Laurent Gallais-During, Institut Fresnel (France)
9:30 AM - 9:50 AM	12726-35 • Quantized nanolaminates of Ta₂O₅-SiO₂ and amorphous silicon-SiO₂ manufactured by magnetron sputter deposition , Silvia Schwyn Thoeny, Evatec AG (Switzerland); Manuel Bärttschi, Rhysearch (Switzerland); Marietta Batzer, Manuel Baselgia, Raphael Gmünder, Stephan Waldner, Evatec AG (Switzerland)
9:50 AM - 10:10 AM	12726-36 • Bandgap energy of quantizing nanolaminates and its relation to the laser-induced damage threshold in the ultraviolet , Morten Steinecke, Sebastian Paschel, Tarik Kellermann, Kevin Kiedrowski, Laser Zentrum Hannover e.V. (Germany); Marco Jupé, Andreas Wienke, Detlev Ristau, Laser Zentrum Hannover e.V. (Germany); Leibniz Univ. Hannover (Germany)

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10:10 AM - 10:30 AM	12726-37 • Particle modeling of nanoscale ablation of resonant dielectric microstructures by Intense mid-IR laser-driven explosions , Simin Zhang, The Ohio State Univ. (USA); Joseph Smith, Marietta College (USA); Maxim Shcherbakov, Univ. of California, Irvine (USA); Giovanni Sartorello, Cornell Univ. (USA); Michael Tripepi, The Ohio State Univ. (USA); Gennady Shvets, Cornell Univ. (USA); Enam A. Chowdhury, The Ohio State Univ. (USA)
10:30 AM - 11:00	Coffee Break
11:00 AM - 12:00 PM	SESSION 9: MEASUREMENT AND MATERIALS Session Chair: Jonathan W. Arenberg , Northrop Grumman Corp. (USA)
11:00 AM - 11:20 AM	12726-39 • Monte Carlo analysis of ISO and raster scan laser damage protocol: part 2 , Christopher J. Stolz, Lawrence Livermore National Lab. (USA)
11:20 AM - 11:40 AM	12726-40 • In situ investigation of ultrafast laser damage on Si (100) surface in ultra-high vacuum , Liam Clink, Zhihan Li, Mohamed Yaseen Noor, Jay Gupta, Enam A. Chowdhury, The Ohio State Univ. (USA)
11:40 AM - 12:00 PM	12726-41 • Investigating the surface morphology and fracture behavior of calcium fluoride under femtosecond laser irradiation , Emma DeAngelis, Mohamed Yaseen Noor, Justin Twardowski, Conrad Kuz, The Ohio State Univ. (USA); Mohamed Ruwaid Rafiuddin, Univ. of Huddersfield (United Kingdom); Enam A. Chowdhury, The Ohio State Univ. (USA)
12:00 PM - 1:30 PM	Lunch Break
1:30 PM - 2:15 PM	POSTER SLAMS: MEASUREMENT AND MATERIALS + FUNDAMENTAL MECHANISMS Session Chair: M.J. Soileau , CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA)
2:15 PM - 3:15 PM	POSTER SESSION: THIN FILMS AND SURFACES, MIRRORS, AND CONTAMINATION
	12726-69 • Combined molecular and metallic particulate laser-induced contamination testing: De-risking activity for the LISA space mission , Moritz . Vogel, Nils Bartels, Wolfgang Riede, Thomas Klumpp, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Christian Dahl, Kai-Christian Voss, SpaceTech GmbH (Germany); Alessandra Ciapponi, European Space Research and Technology Ctr. (Netherlands); Ricardo Martins, European Space Agency (Netherlands); Linda Mondin, European Space Agency (Netherlands)
	12726-70 • Temporally and spatially resolved photoluminescence of laser-induced damage sites of fused silica , Jae Hyuck Yoo, Yoonsoo Rho, Christopher F. Miller, Robin E. Yancey, Ted A. Laurence, C. W. Carr, Lawrence Livermore National Lab. (USA)
	12726-72 • High laser damage threshold polymer coatings for planarization and index-matching of freeform polarization-smoothing optics , Nathaniel D. Urban, Jenny Zhao, Marek Stehlik, John A. Marozas, Kenneth L. Marshall, Alexander T. Song, Dylan B. Rykert, Stavros G. Demos, Univ. of Rochester (USA)
	12726-74 • Laser damage surface morphology and dynamics with ultrafast scanning tunneling microscopy (STM) , Zhihan Li, The Ohio State Univ. (USA)
	12726-75 • Temperature and damage behavior of hybrid coated mirrors under continuous wave laser irradiation , Kevin Kiedrowski, Morten Steinecke, Laser Zentrum Hannover e.V. (Germany); Henrik Ehlers, Michael Kennedy, LASEROPTIK GmbH (Germany); Marco Jupé, Andreas Wienke, Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany); Detlev Ristau, Institute of Quantum Optics, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)
	12726-76 • Laser-induced damage analysis of PMMA optical fibers using raytracing simulations and x-ray tomography , Kevin Kiedrowski, Laser Zentrum Hannover e.V. (Germany); Mario Ferraro, Sapienza Univ. di Roma (Italy), Univ. della Calabria (Italy); Raphael Jauberteau, Stefan Wabnitz, Sapienza Univ. di Roma (Italy); Maria Caterina Crocco, Vincenzo Formoso, Univ. della Calabria (Italy), STAR Research Infrastructure (Italy); Marco Jupé, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany), Cluster of Excellence PhoenixD (Germany); Detlev Ristau, Institute of Quantum Optics, Leibniz Univ. Hannover (Germany), Laser Zentrum Hannover e.V. (Germany), Cluster of Excellence PhoenixD (Germany)
	12726-77 • Energy and power upgrade on LMJ: Approach & tools to estimate damage statistics and identify mechanisms , Chloé Lacombe, Laurent Lamaignère, Kévin Gaudfrin, Florian Gaudfrin, Thierry Donval, Vincent Beau, Jérôme Néauport, CEA-Cesta (France)
	12726-78 • Glass ablation and cutting with a femtosecond Bessel beam , Conrad Kuz, Justin Twardowski, Mohamed Yaseen Noor, Emma DeAngelis, Enam A. Chowdhury, The Ohio State Univ. (USA)

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2:15 PM - 3:15 PM	<p>12726-79 • Theory for ionization of dielectrics with a circularly polarized laser beam, Rachel Nuter, CEA-Cesta (France)</p> <p>12726-81 • Target current and spatial modulations analysis for LIDT measurements using fs laser irradiation, Gabriel Petrisor Bleotu, Extreme Light Infrastructure Nuclear Physics (Romania), Univ. din Bucuresti (Romania), Ecole Polytechnique (France); Stefan Irimiciuc, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania); Alice Dumitru, Dan G. Matei, Extreme Light Infrastructure Nuclear Physics (Romania); Radu Udrea, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Univ. Politehnica din Bucuresti (Romania); Doina Craciun, Ioan Dancus, Valentin Craciun, Institutul National pentru Fizica Laserilor, Plasmei si Radiatiei (Romania), Univ. din Bucuresti (Romania)</p> <p>12726-82 • MELBA: A testbed to study the impact of pulse characteristics on laser-induced damage in UV range and nanosecond regime, Sylvain Grosjean, Martin Cormier, Jean-François Gleyze, Nadja Roquin, CEA-Cesta (France); Jean-Yves Natoli, Institut Fresnel (France); Laurent Lamaignère, CEA-Cesta (France)</p> <p>12726-83 • Shockwave and crack monitoring following nonlinear absorption with picosecond time-resolved microscopic imaging, Matthew R. Ross, Jue Wang, Corning Incorporated (USA)</p> <p>12726-84 • Comparison of fatigue laser-induced damage of HfO₂ & SiO₂ mixture coating and commercial grade standard UV mirrors operating in fs-pulse regime, Laurynas Lukoševičius, Justinas Butkus, Deividas Buinovskis, Altechna UAB (Lithuania)</p> <p>12726-85 • Optical components applying quantized nanolaminates for NIR applications, Marco Jupé, Cassian Bergmann, Morten Steinecke, Andreas Wienke, Laser Zentrum Hannover e.V. (Germany)</p> <p>12726-87 • Continuous wave laser induced damage threshold of Germanium windows at 1.07 microns, John E. McElhenny, DEVCOM Army Research Lab. (USA)</p>
3:15 PM - 4:35 PM	<p>SESSION 10: THIN FILMS III Session Chairs: Ella S. Field, Sandia National Labs. (USA); Eyal Feigenbaum, Lawrence Livermore National Lab. (USA)</p>
3:15 PM - 3:35 PM	<p>12726-42 • Effect of THz-scale intensity fluctuations on bulk damage in KDP, Douglas W. Broege, Michael Spilatro, Univ. of Rochester (USA); Guillaume Duchateau, CEA-Cesta (France); Christophe Dorrer, Univ. of Rochester (USA); Stavros G. Demos, Univ. of Rochester (USA)</p>
3:35 PM - 3:55 PM	<p>12726-43 • Laser-induced damage of CaF₂ optics at 193 nm, Jue Wang, Gerald P. Cox, Keith J. Donohue, Corning Advanced Optics (USA); Ronald W. Davis, Corning Incorporated (USA); Michael D. Thomas, Spica Technologies, Inc. (USA)</p>
3:55 PM - 4:15 PM	<p>12726-44 • Influence of laser beam size on the determination of LIDT, Mihai-George Muresan, Jan Vanda, Saulius Pakalnis, Martin Mydlar, Jan Brajer, HiLASE Ctr. (Czech Republic)</p>
4:15 PM - 4:35 PM	<p>12726-45 • Study of the probability of growth of silica exit surface damage on the National Ignition Facility (NIF) final optics, Christopher F. Miller, Ryan M. Gini, C. W. Carr, Lawrence Livermore National Lab. (USA)</p>
4:35 PM - 5:00 PM	<p>Coffee Break</p>
5:00 PM - 6:40 PM	<p>SESSION 11: FUNDAMENTAL MECHANISMS II Session Chairs: Andrius Melninkaitis, Vilnius Univ. (Lithuania); Rajesh N. Raman, Lawrence Livermore National Lab. (USA)</p>
5:00 PM - 5:20 PM	<p>2726-47 • Determining the bandgap dependence of nonlinear absorption and laser induced damage threshold through numerical simulation and experiment, Joshua McCauley, Laser Zentrum Hannover e.V. (Germany); Xiaochuan Ji, Tongji Univ. (China); Marco Jupé, Laser Zentrum Hannover e.V. (Germany); Jinlong Zhang, Tongji Univ. (China), Key Lab. of Advanced Micro-Structured Materials, Ministry of Education (China); Andreas Wienke, Laser Zentrum Hannover e.V. (Germany); Detlev Ristau, Laser Zentrum Hannover e.V. (Germany), Leibniz Univ. Hannover (Germany)</p>
5:20 PM - 5:40 PM	<p>12726-48 • Influence of linear-to-circular polarization conversion on laser-induced damage of fused silica at 351 nm, Sylvain Grosjean, Martin Cormier, Jean-François Gleyze, Nadja Roquin, Jean-Yves Natoli, Laurent Lamaignère, CEA-Cesta (France)</p>
5:40 PM - 6:00 PM	<p>12726-50 • Filament damage reflow in fused silica optics, Allison E. Browar, Eyal Feigenbaum, James L. Vickers, Gabriel Guss, C. W. Carr, Lawrence Livermore National Lab. (USA)</p>
6:00 PM - 6:20 PM	<p>12726-51 • All-glass metasurface laser optics for lensing, antireflections, and waveplates, Eyal Feigenbaum, Nathan Ray, Jae Hyuck Yoo, Hoang T. Nguyen, Michael A. Johnson, Lawrence Livermore National Lab. (USA)</p>
6:20 PM - 6:40 PM	<p>Closing Remarks, Michael D. Thomas, Spica Technologies, Inc. (USA)</p>