LASER DAMAGE CALL FOR PAPERS

Submit your abstract and present at the leading forum for the exchange of information on the physics and technology of materials for high-power, high-energy lasers. Share your research at Laser Damage 2020.

13–16 September 2020
Hilton Garden Inn
Rochester, New York, USA

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Laser Damage 2020
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Alexander Glass Best Oral Presentation Award
1st Place Best Oral Presentation
Non-localized creation of high-fluence precursors by 351-nm laser exposure [11173-44]
David Cross, Christopher W. Carr, Lawrence Livermore National Lab. (USA)

Arthur Guenther Best Poster Award
1st Place Best Poster Presentation
Direct comparison of laser-induced damage thresholds testing protocols on dielectric mirrors: effect of nanosecond laser pulse shape at NIR and UV wavelengths [11173-42]
Ruta Pakalnyte, Vilnius Univ. (Lithuania); Egidijus Pupka, LIDARIS Ltd. (Lithuania); Andrius Melninkaitis, Vilnius Univ. (Lithuania)

MJ Soileau Best Student Paper Award
1st Place Best Student Presentation
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PLENYALE TITLES: This track will be the main event of the conference is established – plenary talks to open in the first morning session of each conference day. The following three plenary talks are planned for 2020 and 2021.

“Virtual of the future for high power laser research and analysis,” Xiaoying Wei, Los Alamos National Laboratory.

“Study of the nanoscale morphology and optical properties of metallic nanostructures,” Michael J. Frey, University of Toronto, Canada.

“Scalability of high-power laser systems,” J. Michael Shaughnessy, Lawrence Livermore National Laboratory (USA).

MATERIALS AND MEASUREMENTS: Damage to the bulk of transparent optical media can occur in amorphous, polymeric, polycrystalline or crystalline form. Research into the cause of phenomena that influence the damage process, such as surface preparation, exposure to contaminants, and environmental impacts of metallic, and other materials are reported, as well as damage test-
ing protocols. With the advent of nanotechnology, nano-sized components, and nano-structured materials, the relationships between the properties of the bulk, the processing, and engineered nanostructures becomes another topic of interest.


SURFACES, MIRRORS, AND CONTAMINATION: Optical coatings limit the fluence of an optic due to intrinsic and extrinsic flaws and defects. Proper surface preparation, substrate damage, and coating preparation can reduce scattering, environmental degradation and aging prevention, contamination control can also improve the performance of mirrors and other surfaces.

INVITED PRESENTATION: "Scalable and durable glassy coatings for high power laser ultra-thin optics," Eyal Feigenbaum, Lawrence Livermore National Laboratory (USA).

THIN FILMS: Because of the tremendous range of applications of optical thin films, it is necessary to modify the performance of optical measurements, and because thin films are generally the weakest part of optical systems, research into noise-reduction thin films is a vibrant area. In addition to damage thresholds, research includes the development of advanced thin-film technology, characterization, finite element model design, and film response to various environmental attacks and aging.

INVITED PRESENTATION: "The journey from pulsed high energy to high power coatings of the subsurface," Jessica DeGregoto Nelson, Optics (USA).

FUNDAMENTAL MECHANISMS: Topics to be covered include what processes of physical interactions that influence to nonlinear propagation, examples of high energy laser materials, effects, multimodal approaches, and index, and self-focusing. This track also includes modeling, such as the temporal behavior of defect induced damage and the interference between elements in an optical train that affect performance and hence damage.

INVITED PRESENTATION: "Laser Damage in Mid-IR NLO Crystals," Peter Schumacher, BAE Systems (USA).

MINI-SYMPOSIUM ON OPTICAL CERAMICS AND GLASSES CHAIR: Y. K. S. Sundaram, The New York State College of Ceramics, Alfred University, (USA).

MINI-SYMPOSIUM ON Metamaterials CHAIR: B. D. C. Pollock, Stanford University, (USA).

MINI-SYMPOSIUM ON Contamination of Optical Components CHAIR: Swagato Bhattacharya, RAL Space, UK.

MINI-SYMPOSIUM ON Measurement Protocols CHAIR: Clifford W. L. Tien, Universidade Federal do Rio de Janeiro, Brazil.

MINI-SYMPOSIUM ON Measurement Protocols CHAIR: Fengmin Li, Beijing Institute of Optics and Fine Mechanics, China.

MINI-SYMPOSIUM ON Contamination of Ceramics and Glasses CHAIR: S. K. Sundaram, The New York State College of Ceramics, Alfred University, (USA).

TUTORIAL AND DISCUSSION: How to create high performance high power optics: from substrates to coatings CHAIR: William M. Grady, Lawrence Livermore National Laboratory (USA).

High power optics typically require precision surface finishes and pre-coating irregularities. This includes surface roughness, waviness, and form deviations. For example, 100 nm roughness and 10-5 or better. While pre-coated optics are commercial and available against such specifications, it is often aspects of the surface finish outside of these specifications that cause the optics to fail in high power laser environments, including, but not limited to, subsurface damage or stress. This is difficult to test due to the different methods that are used in the polishing of substrates to < 0.4 nm RMS. Examples of different substrate materials and finishes will be presented. In addition, an advanced plasma assist, electron beam high power antireflection coating at < 1030 nm will be applied to a sample of the optics produced. The laser damage results will be presented.

THIN FILM COMPETITION 532-nm Thin Film Damage Competition CO-ORDINATED by Raula A. Negres, Christopher J. Stofl, Lawrence Livermore National Laboratory (USA).

A double-blind laser damage competition will be held to assess damage mechanisms in 532-nm, 0.6, 1.0 and 1.06 micrometer. The results will be shared at the SPIE Laser Damage Symposium. The mirrors will be evaluated by the following requirements:

Reflectance > 99.995%

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No wavefront or stress requirement

No surface quality requirement

The coatings shall be deposited on glass substrates provided by the coating supplier. It is highly desired to have a polished rear surface. The dimensions of the optical elements shall be 55 mm (11 mm) in diameter and at least 5 mm thick.

Samples must be received by June 1, 2020 to the following address:

Raluca Negres, L-470

Lawrence Livermore National Laboratory

7000 East Avenue

Livermore, CA 94550

See web for full details.

Testing will be performed by...