LASER DAMAGE
XLVII ANNUAL SYMPOSIUM ON OPTICAL MATERIALS FOR HIGH-POWER LASERS

Call for Papers
Submit Abstracts by 23 March 2015
www.spie.org/ld15call

National Institute of Standards and Technology
Boulder, Colorado, USA
Conference
27–30 September 2015
The leading forum on materials for high-power / high-energy lasers.

“SPIE Laser Damage in Boulder is a unique forum for an important topic, and the only location where laser damage is the focus of the meeting.”

– 2014 Attendee Survey Comment
Join us for this unique event.

The 47th Annual Symposium on Optical Materials for High-Power Lasers is the leading forum for the exchange of information on the physics/technology of materials for high-power/high-energy lasers. The series of conference proceedings has grown to be a comprehensive source of information on optics for lasers and includes topics on laser-induced damage mechanisms, materials and thin film preparation, durability, properties modeling, testing, and component fabrication. The Symposium will include both oral and poster presentations with no parallel sessions. This year starting the week will be the Sunday Tutorial, Defect-induced Damage in Nano- and Femtosecond Regime.

Distinguished international researchers in the field of optics for high-power/high-energy lasers will present invited talks. Submissions are solicited for the four core technical sessions and the Mini-Symposium.

**LASER-INDUCED DAMAGE ISSUES:**
- Photonic bandgap materials
- High-power fiber lasers
- Fibers for high-power laser applications
- High-power/ultrafast lasers
- Multi-layer thin films
- Nonlinear optical and laser host materials
- Laser damage in high-power laser systems

**APPLICATIONS OF LASER DAMAGE:**
- EUV
- Mirrors
- Nanostructures of optical materials and gratings

**OTHER LASER-INDUCED DAMAGE RELATED ISSUES:**
- Measurement protocols
- Materials characterization
- Fundamental mechanisms
- Contamination of optical components
- Surface and bulk defects
- Metamaterials
- Thermal management of high-power lasers

**TUTORIAL**
- Defect-induced Damage in Nano- and Femtosecond Regime

**THIN FILM DAMAGE COMPETITION**

**MINI-SYMPOSIUM**
- Laser-induced Damage to Multilayers in Femtosecond Regime

**SUBMISSIONS ARE NOW BEING ACCEPTED FOR LASER DAMAGE SYMPOSIUM SESSIONS AND THE MINI-SYMPOSIUM.**

Abstracts Due: 23 March 2015  |  Manuscripts Due: 31 August 2015

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MATERIALS AND MEASUREMENTS
Damage to the bulk of transparent optical media can occur in amorphous, polymeric, polycrystalline or crystalline materials. Research into, and measurements of phenomena that influence the damage process, such as absorption, thermal conductivity, stress-optic coefficients, moduli and defects are reported, as well as damage testing on bulk materials. With the emergence of micro- and nano-structured materials, especially those used in fiber laser systems and photonic crystal structures, the relationship between the propagating laser flux and engineered defects becomes even more important.

Invited Presentation: Characterization of Extremely High-Purity Optical Materials for Solid-State Laser Cooling by Dr. Mansoor Shake-Bahae, Univ. of New Mexico (USA)

SURFACES, MIRRORS, AND CONTAMINATION
Optical surfaces often limit the fluence of an optic due to intrinsic and extrinsic flaws and defects. Proper surface preparation, subsurface damage control, roughness and scattering reduction, environmental degradation and aging prevention, contamination control, can all improve the performance of mirrors and other surfaces.

Invited Presentation: Volume Holographic Elements for High-Power Laser Applications by Dr. Leonid Gleggbo, CREOL, Univ. of Central Florida (USA)

THIN FILMS
Because of the tremendous range of applications of optical multilayers for modifying the performance of optical measurements, and because thin films are generally the weakest part of optical systems, research into more damage-resistant thin films is a vibrant area. In addition to damage thresholds or sensitivity, researchers are interested in advanced film-deposition technology, contamination, film structure, film design, and film response to environmental attack and aging, including hardness and abrasion resistance.

Invited Presentation: Dispersive Dielectric Mirror for Ultrashort-Pulse Laser at High Intensities by Dr. Vladimir Pervak, Ludwig Maximilians Univ. (Germany)

FUNDAMENTAL MECHANISMS
Topics range from the basics of photon-matter interaction to methods of test procedures and data reduction to systems considerations. Emphasis is on nonlinear behavior; for example, multiphoton effects, nonlinear refractive index, and self-focusing. This area also includes modeling, such as thermal behavior of defect-initiated damage and the interplay between elements in an optical train that affect performance and hence damage.

Invited Presentation: What Time-Resolved Measurements Tell About Femtosecond Damage? by Dr. Andrius Melnikaitis, Vilnius Univ. (Lithuania)

TUTORIAL
Defect-induced Damage in Nano- and Femtosecond Regime
Chairred by: Dr. Laurent Gallais, Institut Fresnel (France) This tutorial is focused on the fundamental effects and basic physics of laser-defect interactions with nanosecond and femtosecond laser pulses. It will include also statistical effects in laser-damage-threshold metrology, and implications of defects (including artificial ones) for applications.

MINI-SYMPOSIUM
Laser-induced Damage to Multilayers in Femtosecond Regime
Chairred by: Dr. Vladimir Pervak, Ludwig Maximilians Univ. (Germany)
Major directions of progress of high-power femtosecond lasers include reduction of pulse width towards few femtoseconds, increase of repetition rate to multi-MHz level, and an increase of peak power towards multi-PW range. Those developments put specific requirements on quality of ultrafast multilayer mirrors that must demonstrate high damage threshold both at high average power and high peak power while maintaining proper dispersion to avoid distortions of pulse time-shape. This mini-symposium highlights the most recent results and developments in the field laser-induced damage to the multilayer coatings for high-power femtosecond lasers.

THIN FILM DAMAGE COMPETITION
Broadband Low-Dispersion Mirror Thin Film Damage Competition
Coordinated by: Christopher J. Stolz, Lawrence Livermore National Lab. (USA)
In order to determine the current status of thin film laser resistance within the private, academic, and government sectors, a damage competition will be held with the results shared at the 2015 Laser Damage Symposium. The coatings must meet the following requirements:
- Reflectance > 99.9%
- GDD <±100 fs²
- Wavelength 773 nm ±50 nm
- 45 degrees incidence angle; “P” polarization
- Pulse length 150 ps; Repetition rate 500 Hz
- Ambient lab conditions (25 ±2 degrees C & 40 ±20% relative humidity)
- No wavefront or stress requirement
- No surface quality requirement.

The coatings shall be deposited on glass substrates provided by the coating supplier. The dimensions of the substrate shall be 50 mm (±1 mm) in diameter and at least 10 mm thick. Samples must be received by June 1, 2015 to the following address:
Christopher Stolz, L-460
Lawrence Livermore National Laboratory
7000 East Avenue
Livermore, CA 94550

Damage Competition and testing support provided by Femto Solid Dynamics Laboratory, The Ohio State University, and KM Labs.

Further information and instructions are available online: WWW.SPIE.ORG/LD15CALL
BY SUBMITTING AN ABSTRACT, I AGREE TO THE FOLLOWING CONDITIONS:

An author or coauthor (including keynote, invited, oral, and poster presenters) will:

• Register at the reduced author registration rate (current SPIE Members receive an additional discount on the registration fee).
• Attend the meeting.
• Make the presentation as scheduled in the program.
• Submit a manuscript (6 pages minimum) for publication in the SPIE Digital Library and Proceedings of SPIE.
• Obtain funding for their registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
• Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.

SUBMIT AN ABSTRACT AND SUMMARY

• Please submit a 1-page maximum, text-only abstract for technical review purposes that is suitable for publication. SPIE is authorized to circulate your abstract to conference committee members for review and selection purposes.
• Please also submit a 100-word text summary suitable for early release. If accepted, this summary text will be published prior to the meeting in the online or printed programs promoting the conference.
• Only original material should be submitted.
• Abstracts should contain enough detail to clearly convey the approach and the results of the research.

REVIEW, NOTIFICATION, AND PROGRAM PLACEMENT INFORMATION

• To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
• Conference Chair/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
• The contact author will receive notification of acceptance and presentation details by e-mail no later than 19 May 2015

PRE-REGISTRATION REQUIRED

Registration must be complete by 18 September to guarantee security review. On-site registration will not be available. Registration can be completed online at www.spie.org/LDcall beginning in June 2015.

Registration fee includes:

• Admission to all technical sessions
• Wine and Cheese Reception
• Refreshment breaks (lunches are not included)
• One copy of the book of abstracts, attendance list, and proceedings volume.*

(*No proceedings included in student registration)

AUTHORS NEEDING A VISA TO ATTEND

Individuals requiring Letters of Acceptance to obtain travel visas to attend are advised to submit their abstracts early.

The organizing committee will review to determine acceptance. Once this is complete, you will receive an early notification regarding your submission.

Please apply for your visa as soon as possible and no later than 3 months before the meeting.
27–30 SEPTEMBER 2015

Make your mark—join this leading forum for the exchange of information on the physics/technology of materials for high-power/high-energy lasers

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