The premier conference for high-power/ high-energy lasers, materials & thin films

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LASER DAMAGE 2017 AWARDS

Alexander Glass Best Oral Presentation Award

1st Place Best Oral Presentation

Revealing the relative contribution of photo- and impact-ionization in ultrashort pulse laser-induced damage in solid dielectrics [10447-21]

Peter Jürgens, Anton Husakou, Mikhail Ivanov, Marc J.J. Vrakking, Alexandre Mermillod-Blondin, Max-Born-Institut für Nichtineare Optik und Kuzzeitspektroskopie (Germany)

MJ Soileau Best Student Paper Award

1st Place Best Student Presentation

Time-resolved investigations of laser-dielectric interaction mechanisms (10447-27)

Allan Bildé, Stéphane Guizard, Ecole Polytechnique (France); **Sergei M. Klimentov,** A. M. Prohorov General Physics Institute of the Russian Academy of Sciences (Russian Federation); **Andrius Melninkaitis, Julius Vaicenavicius, Balys Momgaudis,** Vilnius Univ. (Lithuania); **Alexandros Mouskeftaras,** Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Arthur Guenther Best Poster Award

1st Place Best Poster Presentation

A method for the determination of the defect density distribution from standard damage frequency measurements [10447-66]

Jonathen Arenberg, Northrup Grumman Aerospace Systems (USA); **Carmen S. Menoni,** Colorado State Univ. (USA)

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23–26 SEPTEMBER 2018

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50th ANNIVERSARY

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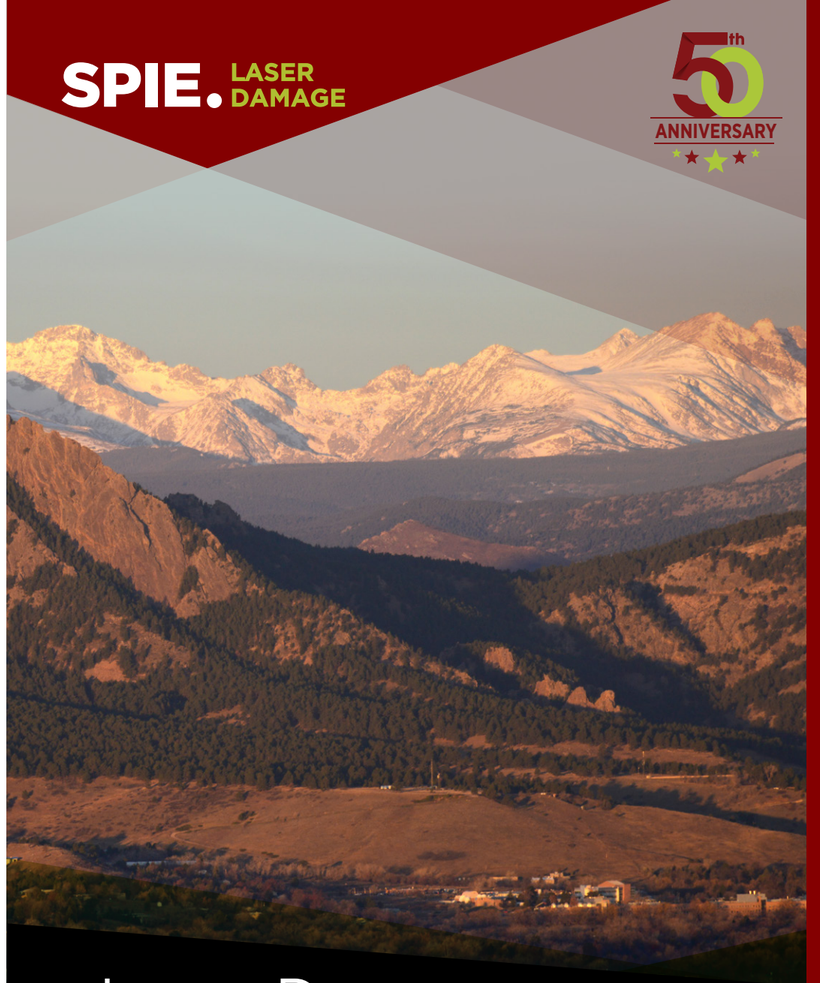
50th ANNIVERSARY



Laser Damage 2018

CALL FOR PAPERS

Submit abstracts by 18 April 2018

23–26 September 2018
Boulder Millennium Hotel
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LASER DAMAGE CALL FOR PAPERS

Plan to Participate in Our 50th Anniversary

2018 marks the 50th Anniversary of the annual SPIE Laser Damage Symposium which will be held 23–26 September 2018 in the Boulder Millennium Hotel, Boulder, Colorado, USA.

This meeting, also known as the 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 conference proceedings series 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.

Celebrating 50 years of successful work for the international research community in those fields. The Meeting will start with a kick-off event – Sunday Evening Tutorial, will host a featured Mini-Symposium, a Thin-Film Laser-Damage Competition, and will include both poster and oral presentations with no parallel sessions.

Since 2012, selected papers presented at this Symposium are published in special sections of *Optical Engineering*—one of the major journals published by SPIE. The most recent Special Section on Laser Damage III contained 28 articles and was published in January 20, 2017. Another Special Section of *Optical Engineering* on Laser Damage IV is under preparation and is open for submissions: https://www.spiedigitallibrary.org/journals/optical-engineering/call-for-papers#divLaserDamageIV

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

Plan to share your latest research by submitting a paper, and join us in Boulder, Colorado this September!

LASER-INDUCED DAMAGE ISSUES:

- Photonic bandgap materials
- High-power fiber lasers
- Fibers for high-power laser applications
- High-power/ultra-fast lasers
- Multi-layer thin films
- Nonlinear optical and laser host materials
- Laser damage in new high-power laser systems

APPLICATIONS OF LASER DAMAGE:

- EUV
- Mirrors
- Nanostructures of optical materials and gratings

TUTORIAL AND DISCUSSION

- Overview of principles, approaches, and methods of characterization of laser beams

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

MINI-SYMPOSIUM ON 50TH ANNIVERSARY CONFERENCE OVERVIEW

- Sources, Basic Effects, and Mechanisms of Ultrafast Laser-Matter Interactions

THIN FILM DAMAGE COMPETITION

Laser Damage Annual Awards established in honor of the founding organizers

The Alexander Glass
Best Oral Presentation Award

The Arthur Guenther
Best Poster Award

The MJ Soileau
Best Student Paper Award

The annual Best Oral Presentation and the Best Poster Awards were renamed in 2016 to honor the founding organizers for this meeting. In 2017, The MJ Soileau Best Student Paper Award was added to the annual awards. These awards are intended to foster participation and advance the research in laser-induced damage, development of materials for high power lasers, and associated technologies, and will provide some financial assistance to researchers, engineers, and students involved in the laser damage community. Each of the recipients will receive a beautiful glass award and $500 Cash.

The awards are supported and approved by the 2016-2017 Laser Damage Co-Chairs, with funds matched by SPIE.

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 nanostructured 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.

KEYNOTE PRESENTATION: Standards on Laser-Induced Damage, **Detlev Ristau,** Laser Zentrum Hannover (Germany)

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: Getting a high-power UV laser into space: The story of the Aladin laser development for the European Space Agency's Aeolus satellite,
Denny Wernham, European Space Agency (Germany)

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.

KEYNOTE PRESENTATION: Recent advances on light matter interaction in layered media, **Michel Lequime,** Institut Fresnel (France)

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.

KEYNOTE PRESENTATION: **Peter Herman,** Univ. of Toronto (Canada)

TUTORIAL ON LASER BEAM CHARACTERIZATION

CHAIRED BY: **Bernd Eppich,** Ferdinand-Braun-Institut, Leibniz-Institut für Höchstfrequenztechnik, and BeamXpert GmbH (Germany)

This tutorial is focused on overview of principles, approaches, and methods of characterization of laser beams. Measurements of beam quality, diameter of laser spot on target surface, and other laser-beam parameters are inevitable for accurate measurements of laser-damage thresholds. This tutorial covers those topics to educate the next generation of laser-damage research community.

MINI-SYMPOSIUM ON 50TH ANNIVERSARY CONFERENCE OVERVIEW

CHAIRED BY: **MJ Soileau,** Univ. of Central Florida (USA) and **Wolfgang Rudolph,** The Univ. of New Mexico (USA)

This Mini-Symposium is devoted to the overview of the conference progress, history, and contribution to the research worldwide as well as to overview of the current state in the fields of research directly related to the major topics of the conference: fundamentals of laser-matter interactions, thin films, measurements of laser-damage thresholds, characterization of optical materials for high-power / high-energy lasers. This event hosts overview invited talks of leading experts and long-term contributors to the field, for example:

Alex Glass, Lawrence Livermore National Labs. (retired) (USA) "Reflections on 50 Years of Laser Damage"

Martin Stickley, DARPA/AFCRL, BDM International, CREOL/ Univ. of Central Florida (retired) (USA) "The Laser Damage Meeting: The Early Years"

Christopher Stolz, Lawrence Livermore National Labs. (USA) "After 10 years of the International Thin Film Competition, what have we learned"

Scott Diddams, NIST (USA) "The history and presence of high-resolution laser spectroscopy and its applications"

Brian Newnam, Los Alamos National Lab. (retired) "TBD"

THIN FILM DAMAGE COMPETITION

1064-nm Mirror Thin Film Damage Competition

COORDINATED BY: **Raluca A. Negres, Christopher J. Stolz,** Lawrence Livermore National Lab. (USA)

A double-blind laser damage competition will be held to determine the current nanosecond laser damage resistance of 1064-nm, 0 degree multilayer mirrors over the last ten years since the 2008 initial launch of this thin film damage competition with mirrors of the same specifications.. The results will be shared at SPIE Laser Damage 2018. The mirrors must meet the following requirements:

- Reflectance > 99.5%
- Wavelength 1064 nm
- 0 degrees incidence angle
- Pulse length 5-ns; Single-longitudinal mode laser; Repetition rate 10 Hz
- Environment: Ambient air (normal and low humidity possible)
- 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 substrate shall be 50 mm (±1 mm) in diameter and at least 10 mm thick. Samples must be received by June 1, 2018 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

Spica Technologies Inc.

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

Abstracts Due: 18 April 2018 • Manuscripts Due: 24 October 2018

2018

23-26 SEPTEMBER

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- Attend the meeting.
- Make the presentation as scheduled in the program.
- Submit a manuscript (4 pages minimum) for publication in the SPIE Digital Library and Proceedings of SPIE.
- Obtain funding for 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.

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http://www.spie.org/LD18call

- 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.
- Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this conference.
- Please do not submit the same, or similar, abstracts to multiple conferences.

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.
- Final placement in an oral or poster session is subject to the Chairs' discretion.
- The contact author will receive notification of acceptance and presentation details by e-mail 6 June 2018.

50th ANNIVERSARY

Abstracts Due: 18 April 2018

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- Manuscript instructions are available from the "For Authors/Presenters" link on the conference website.
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VENUE

Boulder Millennium Harvest House Hotel

Centrally located and with 18,000 square feet of meeting facilities, this hotel is an ideal venue for Laser Damage.

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 schedule in May 2018.

Please apply for your visa as soon as possible and no later than 3 months before the meeting.

Further information and instructions are available online: **www.spie.org/LD18call**