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by 16 April 2010

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# SPIE Laser Damage

XLII Annual Symposium on

## Optical Materials for High Power Lasers

### ▶ Laser-Induced Damage Issues in:

- 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

### ▶ Other Laser-Induced Damage Related Issues

- Measurement protocols
- Materials characterization
- Fundamental mechanisms
- Contamination of optical components
- Surface and bulk defects

### ▶ MINI-SYMPOSIUM: Fundamentals of Laser Ablation



Connecting minds for global solutions  
The leading forum for high-power/high-energy lasers

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Call for Papers

27–29 September 2010

National Institute of Standards and Technology  
Boulder, Colorado, USA

[spie.org/LDcall](http://spie.org/LDcall)



**SPIE**

Connecting minds. Advancing light.

# Don't miss the premier meeting on laser-induced damage

The 42<sup>nd</sup> 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 materials and thin film preparation, durability, properties modeling, testing, and component fabrication. This symposium will include both poster and oral presentations with no parallel sessions. Distinguished international researchers in the field of optics for high power/high energy lasers will present invited talks. Submissions are now being accepted for the following Laser Damage Symposium sessions and the Mini-Symposium

## 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.

*Invited Presentation:* Multiscale analysis: a way to investigate laser damage precursors in materials for high power applications at nanosecond pulse duration, **Jean-Yves Natoli**, Institut Fresnel (France)

## 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:* Developing MRF technology for the manufacture of large-aperture optics in mega-joule class laser systems, **Joseph Menapace**, Lawrence Livermore National Lab. (USA)

Conference Cochairs: **Gregory J. Exarhos**, Pacific Northwest National Lab. (USA); **Vitaly E. Gruzdev**, Univ. of Missouri-Columbia (USA); **Joseph A. Menapace**, Lawrence Livermore National Lab. (USA); **Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany); **M. J. Soileau**, Univ. of Central Florida (USA)

International Program Committee: **Detlev Ristau (Committee Chair)**, Laser Zentrum Hannover e.V. (Germany); **James E. Andrew**, Atomic Weapons Establishment (United Kingdom); **Jonathan W. Arenberg**, Northrop Grumman Aerospace Systems; **Mireille Commandré**, Institut Fresnel (France); **Stavros G. Demos**, Lawrence Livermore National Lab.; **Leonid B. Glebov**, CREOL, Univ. of Central Florida; **Klaus Mann**, Laser-Lab. Göttingen e.V. (Germany); **Carmen S. Menoni**, Colorado State Univ.; **Masataka Murahara**, Tokai Univ. (Japan); **Jérôme Néauport**, Commissariat à l'Énergie Atomique (France); **Semyon Papernov**, Univ. of Rochester; **Amy L. Rigatti**, Univ. of Rochester; **Jianda Shao**, Shanghai Institute of Optics and Fine Mechanics (China); **Michelle D. Shinn**, Thomas Jefferson National Accelerator Facility (USA)

Founding Organizers: **Arthur H. Guenther** and **Alexander J. Glass**

Organizer: **SPIE**

Co-Sponsors: **Lawrence Livermore National Lab.**

**Laser Zentrum Hannover e.V. (Germany)**

Cooperating Organizations:

**Pacific Northwest National Lab.**

**National Institute of Standards and Technology**

**CREOL & FPCE, College of Optics and Photonics, Univ. of Central Florida**

**University of Missouri, Columbia**

Technical Contact: **Kent Ruchford**, National Institute of Standards and Technology

## 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:* Advances in ion beam sputtered optical interference coatings, **Carmen Menoni**, Colorado State Univ. (USA)

## 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 Speaker:* **Sergey V. Garnov**, A.M. Prokhorov General Physics Institute (Russia)

## MINI-SYMPOSIUM:

### Fundamentals of Laser Ablation

*Mini-Symposium Chair:* **Klaus Sokolowski-Tinten**, Univ. Duisburg-Essen (Germany)

Laser ablation describes the permanent removal of macroscopic amounts of material from a laser-irradiated surface. Understanding laser ablation is of major importance for many technological applications such as laser machining, laser surgery, pulsed-laser-deposition, and nano-particle synthesis. It is also of great interest from a fundamental physics point of view, because during the ablation process fundamental changes in the state of aggregation of the material must occur. This mini-symposium will address the basic physical phenomena involved in laser ablation, with emphasis on new developments on the experimental (i. e. short pulse laser ablation) as well as on the theoretical (i. e. large-scale molecular dynamics) "front".

*Invited Presentation:* Insight from molecular dynamics simulation into ultrashort-pulse laser ablation, **Herbert Urbassek**, Technische Univ. Kaiserslautern (Germany)

## Thin Film Damage Competition

A double blind laser damage competition will be held to determine the current laser resistance of UV AR coatings in the industrial and university sectors. The results will be shared at the 2010 Laser Damage Symposium. The coatings must meet the following requirements:

- Reflectance <0.5% at 351 nm coated on both sides
- 0 degrees incidence angle
- 5 ns pulse length
- Ambient temperature, humidity, and pressure environment
- No wavefront, stress, or surface quality requirement

The coatings shall be deposited on fused silica substrates provided by the coating supplier. To differentiate coating and substrate damage influences, the coating vendor will be required to submit an uncoated and coated sample. The dimensions of the substrate shall be 50 mm ( $\pm 1$  mm) in diameter and 10 mm ( $\pm 1$  mm) thick. Samples must be received by **1 July 2010**. Further information and instructions are available online: [spie.org/LDcall](http://spie.org/LDcall)

# Abstract Submission/Abstract Book



## XLII Annual Symposium on Optical Materials for High Power Lasers 27–29 September 2010

National Institute of Standards and Technology  
Lobby, Building 1, 325 Broadway  
Boulder, Colorado, USA

### IMPORTANT!

- Submissions imply the intent of at least one author to register, attend the symposium, present the paper (either orally or in poster format), and submit a manuscript.
- All authors are expected to secure funding for registration fees, travel, and accommodations independent of SPIE through their sponsoring organizations before submitting abstract.
- Authors will be notified of acceptance 11 June 2009. Authors may request an earlier acceptance letter in order to ensure adequate time to secure a visa.

**Web submission** is strongly encouraged to ensure that your abstract will be immediately accessible by the conference committee for review, and included in the abstract book that will be distributed at the meeting.

- Navigate to the “submit an abstract” link found at

### [spie.org/LDcall](http://spie.org/LDcall)

- If you are a first-time user of MySPIE, click on the “create new account link”. To simplify account creation, use your SPIE ID# which is found on SPIE Membership cards or the label of any SPIE mailing.
- For more detailed information about abstract submissions and participation, navigate to the “submit an abstract” link at <http://spie.org/LDcall> and click on the “Abstract Submission Guidelines” link on the left of the screen.

**Before you begin** please have the following information available:

#### 1. ABSTRACT TITLE

#### 2. AUTHORS (principal author first)

For each author:

- First (given) Name (initials not acceptable)
- Last (family) Name
- Affiliation
- Mailing Address
- Telephone Number
- Fax Number
- Email Address
- Identify the contact author (the contact author receives all the correspondence regarding the submission and must submit manuscript and all revisions)

#### 3. PRESENTATION PREFERENCE “Oral Presentation” or “Poster Presentation.”

#### 4. PRINCIPAL AUTHOR’S BIOGRAPHY

Approximately 50 words.

#### 5. ABSTRACT TEXT No longer than one page in length.

#### 6. KEYWORDS Maximum of five keywords.

### Submission Questions?

SPIE Headquarters +1 360 676 3290 or  
[abstract\\_help@spie.org](mailto:abstract_help@spie.org)

### Critical Dates

Abstract Due Date:  
16 April 2010

Manuscript Due Date:  
30 August 2010

Abstracts received by abstract due date, if accepted, will be reproduced in a booklet distributed at the meeting. The proceedings of this symposium will be available after the meeting.

### Paper Review

- To ensure a high-quality conference, all abstracts will be reviewed for merit and content by the organizers.

### Proceedings of SPIE

Manuscript preparation information will be sent by SPIE. This symposium will result in a full-manuscript Chair/Editor reviewed volume published in the Conference Proceedings by SPIE. Correctly formatted, ready-to-print manuscripts are required from all accepted authors. Electronic submissions are highly preferred, and result in higher quality reproduction. Submission must be made in PostScript or MS Word. Manuscripts must be submitted in English by **30 August 2010** for post-meeting publication. Authors are required to transfer copyright of the manuscript to SPIE or to provide a suitable publications license. Papers published are indexed in leading scientific databases including INSPEC, Ei Compendus, Physics Abstracts, Chemical Abstracts, International Aerospace Abstracts, and Index to Scientific and Technical Proceedings.

### Registration Fee Policy and Registration Form

Registration must be complete by **13 September 2010** to guarantee security review. The registration fee is \$550 (US\$) and \$150 (US\$) for students. On-site registration **WILL NOT** be available. Registration can be completed on line at: <http://spie.org/LDcall>

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.

### 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 visas as soon as possible and **no later than 3 months before the meeting.**

### Questions?

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