

# Technical Program

## Boulder Damage Symposium XXXVIII

*Annual Symposium on Optical Materials for High Power Lasers*

*25–27 September 2006*

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



**Materials and Measurements**

**Surfaces, Mirrors, and  
Contamination**

**Thin Films**

**Fundamental Mechanisms**

**MINI-SYMPOSIUM: Optics in a  
Hostile Environment**



The International Society  
for Optical Engineering

*Organizer:*

**SPIE—The International Society for Optical Engineering**

*Co-Sponsors:*

**Lawrence Livermore National Lab.  
Pacific Northwest National Lab.**

*Cooperating Organizations:*

**Center for High Technology Materials (CHTM),  
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**Laser Zentrum Hannover e.V. (Germany)**  
**National Institute of Standards and Technology**  
**Electromagnetic Remote Sensing Defence Technology  
Ctr. (United Kingdom)**  
**School of Optics: CREOL & FPCE, Univ. of Central  
Florida**

*Conference Co-chairs:*

**Gregory J. Exarhos**, Pacific Northwest National Lab.  
**Arthur H. Guenther**, CHTM/The Univ. of New Mexico  
**Keith L. Lewis**, Electromagnetic Remote Sensing Defence  
Technology Ctr. (United Kingdom)  
**Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany)  
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**Christopher J. Stolz**, Lawrence Livermore National Lab.

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**Claude Amra**, Institut Fresnel (France)  
**James E. Andrew**, AWE plc (United Kingdom)  
**Hervé Bercegol**, CEA Cesta (France)  
**Michael D. Feit**, Lawrence Livermore National Lab.  
**Jerry B. Franck**, U.S. Army Night Vision & Electronic  
Sensors Directorate  
**Leonid B. Glebov**, College of Optics and Photonics/Univ. of  
Central Florida  
**Vitali E. Gruzdev**, Univ. of Missouri/Columbia  
**Klaus R. Mann**, Laser-Lab. Göttingen e.V. (Germany)  
**Masataka Murahara**, Tokai Univ. (Japan)  
**Semyon Papernov**, Univ. of Rochester  
**Amy L. Rigatti**, Univ. of Rochester  
**Alan F. Stewart**, The Boeing Co.  
**Kunio Yoshida**, Osaka Institute of Technology (Japan)

*Technical Contact:*

**Kent Rochford**, National Institute of Standards and  
Technology

**IMPORTANT!**

You will need your registration badge to get into the NIST parking lot. Visitors are required to show photo identification upon arrival and must wear a visitors badge at all times while on the NIST campus.

# Conference 6403

**Monday-Wednesday 25-27 September  
2006 • Proceedings of SPIE Vol. 6403**

## Boulder Damage Symposium XXXVIII

*Annual Symposium on Optical Materials  
for High Power Lasers*

### Sunday 24 September

**Registration Material Pick-up and Mixer Sun. 18.00 to 21.00**  
*The Boulder Marriott*

### Monday 25 September

**Registration Material Pick-up . . . . . Mon. 07.30 to 08.30**  
*The Boulder Marriott*

**Poster Placement at NIST . . . . . Mon. 07.30 to 08.30**  
*Poster authors for the Monday poster session are  
to set-up their posters at this time.*

**Opening Remarks . . . . . Mon. 08.30 to 09.00**  
*Chair: Gregory J. Exarhos, Pacific Northwest National Lab.*

**SESSION 1 . . . . . Mon. 09.00 to 12.30**

#### Fundamental Mechanisms I

*Chairs: Gregory J. Exarhos, Pacific Northwest National Lab.;*  
**Leonid B. Glebov**, College of Optics & Photonics/Univ. of Central Florida  
09.00: **Femtosecond interaction processes near threshold: damage and  
ablation** (*Invited Paper*), R. Fedosejevs, Univ. of Alberta (Canada) . . . . . [6403-01]  
09.40: **Limits of performance CW laser damage**, R. S. Shah, J. J. Rey,  
A. F. Stewart, The Boeing Co. . . . . [6403-02]

#### Monday Poster Overview

10.00 to 10.30

*All Fundamental Mechanisms and Surfaces, Mirrors, and Contamination poster  
authors are asked to give 2-minute/2-viewgraph overviews of their posters in the  
order they appear in the program.*

**Poster Session and Refreshment Break . . . . . 10.30 to 11.30**

**SESSION 1 continued . . . . . Mon. 11.30 to 12.30**

11.30: **Thermal imaging investigation of modified fused silica at surface  
damage sites for understanding the underlying mechanisms of damage  
growth**, S. G. Demos, R. A. Negres, M. W. Burke, P. P. DeMange, S. B. Sutton,  
M. D. Feit, Lawrence Livermore National Lab. . . . . [6403-03]  
11.50: **Damages to optical silica glass: processes and mechanisms**, S. Luo,  
Los Alamos National Lab.; L. Zheng, Univ. of Missouri/Columbia; Q. An, H. Wu,  
Univ. of Science and Technology of China (China); K. Xia, Univ. of Toronto (Canada);  
S. Ni, Univ. of Science and Technology of China (China) . . . . . [6403-04]  
12.10: **Revisited thermal approach to model the laser-induced damage**,  
D. D. Anthony, Commissariat à l'Energie Atomique (France) . . . . . [6403-15]  
Lunch Break . . . . . 12.30 to 14.00

## SESSION 2 ..... Mon. 14.00 to 15.00

### Fundamental Mechanisms II

*Chairs:* **Hervé Bercegol**, CEA Cesta (France);  
**Amy L. Rigatti**, Univ. of Rochester

- 14.00: **Figures of merit for high-energy laser windows: comments on past and recent formulations**, C. A. Klein, C.A.K. Analytics, Inc. .... [6403-06]  
14.20: **A feasible mechanism of molecular contamination-induced laser optic damage**, J. S. Canham, Swales Aerospace ..... [6403-07]  
14.40: **Importance of free surfaces for damage crater formation**, M. D. Feit, S. Rubenchik, Lawrence Livermore National Lab. .... [6403-08]

## Poster Session and Refreshment Break ..... 15.00 to 16.00

## SESSION 3 ..... Mon. 16.00 to 17.40

### Surfaces, Mirrors, and Contamination

*Chairs:* **Keith L. Lewis**, Electromagnetic Remote Sensing Defence Technology (United Kingdom); **Claude Amra**, Institut Fresnel (France)

- 16.00: **Using gold nanoparticles as artificial defects in thin films: what have we learned about laser-induced damage driven by localized absorbers? (Invited Paper)**, S. Papernov, A. W. Schmid, Univ. of Rochester ..... [6403-09]  
16.40: **Investigations of sacrificial and plasma mirrors on the HELEN laser CPA beamline**, J. E. Andrew, A. J. Comley, AWE plc (United Kingdom) ..... [6403-10]  
17.00: **Growth rate of laser damage on the input surface in fused silica at  $3\omega$** , M. A. Norton, Lawrence Livermore National Lab. .... [6403-11]  
17.20: **Study of the evolution of mechanical defects on silica samples under laser irradiation at 355 nm**, M. A. Josse, B. Pussacq, J. Rullier, CEA Cesta (France) ..... [6403-12]

### Alpine Optics Open House and Reception at Alpine Research Org.

Monday 18.30 to 19.30

## Poster Session

### Room 1 ..... Mon. 10.30 to 11.30 and 15.00 to 16.00

#### Fundamental Mechanisms, and Surfaces, Mirrors, & Contamination

- Excimer laser purification of bulk carbon single-walled nanotubes and damage of carbon allotropes**, K. E. H. Gilbert, D. A. Keenan, National Institute of Standards and Technology; A. C. Dillon, National Renewable Energy Lab.; J. H. Lehman, National Institute of Standards and Technology ..... [6403-14]  
**Revisited thermal approach to model the laser-induced damage**, D. D. Anthony, Commissariat à l'Energie Atomique (France) ..... [6403-15]  
**Fabrication of refractive index gratings in optical glasses by the filamentary propagation of femtosecond laser pulses**, E. Gaizauskas, V. Vaičaitis, V. Kudrišov, M. Peckus, T. Balčiūnas, V. Sirutkaitis, Vilnius Univ. (Lithuania) ..... [6403-16]  
**Laser damage on diffractive optics**, L. Gallais, G. Demesy, M. Commandré, Institut Fresnel (France); S. Tisserand, Silios Technologies (France) ..... [6403-17]  
**Numerical and experimental study of focal spot degradation induced by particles on surface optics**, B. Martinez, V. Beau, J. Rullier, CEA Cesta (France) ..... [6403-18]  
**Size influence of artificial metallic defects on laser surface cleaning process**, J. Capoulade, J. Natoli, Institut Fresnel (France); S. Palmier, S. Garcia, J. Rullier, I. Toven-Pecault, CEA Cesta (France) ..... [6403-19]  
**Effects of laser-induced damage on optical windows in the presence of adhesives under simulated thermal-vacuum conditions**, C. Y. Sheng, Genesis Engineering; P. T. C. Chen, R. J. Hedgeland, NASA Goddard Space Flight Ctr.; J. S. Canham, Swales Aerospace ..... [6403-20]  
**Evaluation of cleaning methods for multilayer diffraction gratings**, B. Ashe, K. L. Marshall, C. Giacofei, A. L. Rigatti, T. J. Kessler, A. W. Schmid, J. B. Oliver, J. C. Keck, A. Kozlov, Univ. of Rochester ..... [6403-21]

## Poster Session

### Room 2 ..... Mon. 10.30 to 11.30 and 15.00 to 16.00

#### Surfaces, Mirrors, & Contamination

- Impact of organic contamination on 1064-nm laser-induced damage threshold of dielectric mirrors**, A. A. P. Pereira, S. S. B. Becker, J. Coutard, CEA Grenoble (France); I. Toven-Pecault, CEA Cesta (France); P. R. Bouchut, CEA Grenoble (France) ..... [6403-23]  
**Laser-induced contamination of silica coatings in vacuum**, S. S. B. Becker, A. A. P. Pereira, P. R. Bouchut, F. Geffraye, CEA Grenoble (France) ..... [6403-24]  
**Surface damage growth mitigation on KDP/DKDP optics using single-crystal diamond micromachining ball end mill contouring**, P. Geraghty, Lawrence Livermore National Lab. .... [6403-25]  
**The effect of pulse duration and shape on SiO<sub>2</sub> surface damage site growth and morphology**, C. W. Carr, Lawrence Livermore National Lab. .... [6403-26]  
**Mitigation of growth of laser initiated surface damage in fused silica using a 4.6- $\mu$ m wavelength laser**, G. M. Guss, Lawrence Livermore National Lab. [6403-27]  
**Ultra-precision machining of CaF<sub>2</sub> single crystals and bulk laser-induced damage threshold**, Y. Namba, Chubu Univ. (Japan) ..... [6403-28]  
**MRF applications: manufacture of large-aperture ultraviolet laser resistant continuous phase plates for high-power lasers**, J. A. Menapace, P. J. Davis, Lawrence Livermore National Lab. .... [6403-29]

## Important Dates

**MANDATORY Online Meeting Registration:  
6 September 2006**

**Hotel Reservations: 22 August 2006**

**Manuscript Due Date: 1 November 2006**

# Conference 6403

## Tuesday 26 September

**Poster Placement at NIST . . . . . Tues. 07.30 to 08.30**  
*Poster authors for the Tuesday poster session are to set-up their posters at this time.*

**SESSION 4 . . . . . Tues. 08.40 to 12.30**

### MINI SYMPOSIUM: Optics in a Hostile Environment

*Chairs: Alan F. Stewart, The Boeing Co.;*

**Jerry B. Franck, U.S. Army Night Vision & Electronic Sensors Directorate**

08.40: **Optical coatings and surfaces in space: MISSE**, A. F. Stewart, The Boeing Co.; M. M. Finckenor, NASA Marshall Space Flight Ctr. . . . . [6403-31]

09.00: **Surface contamination of the LIL optical components and their evolution under laser irradiation**, S. Palmier, S. Garcia, L. Lamaignère, J. Rullier, I. Tovenca-Pecault, CEA Cesta (France); L. Servant, Univ. Bordeaux I (France) . . . . . [6403-32]

09.20: **Contamination in chemical lasers and damage-resistant coatings for laser mirrors**, S. C. Dass, Boeing LTS, Inc.; D. W. Reicher, S. Systems, Inc.; V. A. Valdez, Boeing LTS, Inc. . . . . [6403-33]

09.40: **Ophthalmic optical coatings: the real world can be more aggressive than you think**, M. E. Mildebrath, Essilor of America, Inc. . . . . [6403-34]

### Tuesday Poster Overview

10.00 to 10.30

*All Mini-Symposium and Thin Films poster authors are asked to give 2-minute/2-viewgraph overviews of their posters in the order they appear in the program.*

**Poster Session and Refreshment Break . . . . . 10.30 to 11.30**

**SESSION 4 continued . . . . . Tues. 11.30 to 12.30**

11.30: **A mechanism for erosion of optics exposed to a laser-generated EUV plasma**, J. W. Arenberg, Northrop Grumman Space Technology . . . . . [6403-35]

11.50: **Xtreme optics: the behavior of cavity optics for the Jefferson Lab Free-Electron Laser**, M. D. Shinn, Thomas Jefferson National Accelerator Facility; C. Behre, Jr., Naval Surface Warfare Ctr.; S. Benson, D. Douglas, H. F. Dylla, C. Gould, J. Gubeli III, D. Hardy, K. Jordan, S. Zhang, Thomas Jefferson National Accelerator Facility . . . . . [6403-36]

12.10: **Laser-induced optical damage in neutron-irradiated fused silica**, J. F. Latkowski, R. P. Abbott, V. K. Kanz, B. K. Bell, Lawrence Livermore National Lab. . . . . [6403-37]

Lunch Break . . . . . 12.30 to 14.00

**SESSION 5 . . . . . Tues. 14.00 to 15.20**

### Thin Films I

*Chairs: M. J. Soileau, College of Optics & Photonics/Univ. of Central Florida; Kunio Yoshida, Osaka Institute of Technology (Japan)*

14.00: **Recent advances in magnetron sputtered superlattice and quantum well structures (Invited Paper)**, P. M. Martin, W. D. Bennett, L. C. Olsen, C. H. Henager, Pacific Northwest National Lab. . . . . [6403-38]

14.40: **Laser-induced damage in gradual index layers and rugate filters**, M. Jupe, L. S. Jensen, M. Lappschies, K. Starke, D. Ristau, Laser Zentrum Hannover e.V. (Germany) . . . . . [6403-39]

15.00: **Glancing angle deposited thin films and their applications in laser systems**, J. Shao, S. Wang, Z. Shen, X. Fu, H. He, Z. Fan, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [6403-40]

**Poster Session and Refreshment Break . . . . . 15.20 to 16.20**

**SESSION 6 . . . . . Tues. 16.20 to 17.40**

### Thin Films II

*Chairs: M. J. Soileau, College of Optics & Photonics/Univ. of Central Florida; Kunio Yoshida, Osaka Institute of Technology (Japan)*

16.20: **A year of automated LDT testing on ion-beam sputtered thin film optics and laser conditioning of IBS films**, D. C. Ness, T. E. Bittancourt, A. D. Streater, Research Electro-Optics, Inc. . . . . [6403-41]

16.40: **Study of laser-induced damage at 2 μm on coated and uncoated ZnSe substrates**, H. T. Krol, Institut Fresnel (France); C. Grèzes-Besset, Cilas Marseille (France); L. Gallais, J. Natoli, M. Commandré, Institut Fresnel (France) . . . . . [6403-42]

17.00: **Direct measurements of residual absorption in fluoridic thin films and optical materials for DUV laser applications**, C. Mühlig, W. Triebel, S. Kufert, C. Noppene, Institut für Physikalische Hochtechnologie e.V. (Germany); H. Bernitzki, JENOPTIK Laser, Optik, Systeme GmbH (Germany); S. Schröder, Fraunhofer Institut für Angewandte Optik und Feinmechanik (Germany) . . . . . [6403-43]

17.20: **Multilayer dielectric gratings for femtosecond optical pulse compressor**, Y. Dai, S. Liu, J. Shao, K. Yi, Z. Fan, Shanghai Institute of Optics and Fine Mechanics (China) . . . . . [6403-44]

### Wine and Cheese Reception at NCAR

Tues. 18.00 to 19.30

### Poster Session

**Room 1 . . . . . Tues. 10.30 to 11.30 and 15.20 to 16.20**

### Thin Films

**Ion-beam deposition of (NbTa)2O5/SiO2 multilayers for high-efficiency 800-nm dielectric gratings for high-average power laser systems**, C. S. Menoni, D. Patel, F. Brizuela, Y. Wang, M. A. Larotonda, K. J. Hsiao, J. J. G. Rocca, Colorado State Univ.; H. T. Nguyen, T. C. Carlson, C. R. Hoaglan, J. D. Nissen, M. D. Aasen, J. E. Peterson, J. A. Britten, Lawrence Livermore National Lab. . . . . [6403-45]

**Assessing the impact of atomic oxygen in the damage threshold and stress of hafnia films grown by ion-beam assisted deposition**, D. Patel, F. Brizuela, Y. Wang, M. A. Larotonda, J. J. G. Rocca, C. S. Menoni, Colorado State Univ.; F. G. Tomasel, Advanced Energy Industries, Inc.; S. Kholi, P. R. McCurdy, Colorado State Univ. . . . . [6403-46]

**Improvement in laser light resistance of fs- dielectric optics using silica mixtures**, M. Jupé, L. S. Jensen, M. Lappschies, K. Starke, D. Ristau, Laser Zentrum Hannover e.V. (Germany) . . . . . [6403-47]

**Morphology investigations of laser-induced damage**, B. Wu, L. S. Jensen, M. Jupé, K. Starke, D. Ristau, Laser Zentrum Hannover e.V. (Germany) . . . . . [6403-48]

**Laser resistivity of selected multilayer designs for DUV/VUV applications**, S. Günster, H. Blaschke, D. Ristau, Laser Zentrum Hannover e.V. (Germany) . . . . . [6403-49]

**The microstructure and LIDT of Nb2O5, ZrO2, and Ta2O5 optical coatings**, R. Buzelis, G. Abromavicius, R. Drazdys, Fizikos Institutas (Lithuania); A. Melnikaitis, V. Sirutkaitis, Vilnius Univ. (Lithuania); A. Skrebutenas, Optida Co. (Lithuania); R. Juskenas, A. Selskis, Institute of Chemistry (Lithuania) . . . . . [6403-50]

**Optical characterization of antireflective sol-gel coatings fabricated using dip coating method**, A. Melnikaitis, K. Juskevicius, M. Maciulevicius, V. Sirutkaitis, A. Beganskiene, I. Kazadojev, A. Kareiva, Vilnius Univ. (Lithuania); D. Perednis, Institute of Physics (Lithuania) . . . . . [6403-51]

**A comparative exploration of semiconductor laser facet coating materials and their related damage thresholds**, C. C. Clark, G. S. Buller, E. J. McBrearty, Helia Photonics Ltd. (United Kingdom) . . . . . [6403-52]

**Poster Session**

**Room 2 . . . . . Tues. 10.30 to 11.30 and 15.20 to 16.20**

**MINI SYMPOSIUM: Optics in a Hostile Environment, and Materials & Measurements**

**Laser qualification testing of space optics**, W. Riede, P. Allenspacher, German Aerospace Ctr. (Germany) . . . . . [6403-53]

**Damage threshold investigations of high-power laser optics under atmospheric and vacuum conditions**, L. S. Jensen, M. Jupé, M. Lappschies, H. Ehlers, K. Starke, D. Ristau, Laser Zentrum Hannover e.V. (Germany); W. Riede, P. Allenspacher, H. Schröder, German Aerospace Ctr. (Germany); K. R. Mann, U. Leinhos, Laser-Lab. Göttingen e.V. (Germany) . . . . . [6403-54]

**Characterization tools for KDP/DKDP crystals investigation: toward the identification of laser-damage precursor defects, part 2: optical characterizations**, M. Pommies, D. Damiani, B. Bertussi, X. Leborgne, H. Piombini, A. S. Surmin, J. Birolleau, F. Pilon, F. P. Guillet, S. Lambert, CEA Le Ripault (France) . . . . . [6403-55]

**Characterization tools for KDP/DKDP crystals investigation: toward the identification of laser-damage precursors, part 1**, A. S. Surmin, F. P. Guillet, S. Lambert, F. Pilon, J. Birolleau, M. Pommies, D. Damiani, B. Bertussi, H. Piombini, X. Leborgne, CEA Le Ripault (France) . . . . . [6403-56]

**Influence of the laser beam size on laser-induced damage threshold measurement in KDP components**, J. Capoulade, J. Natoli, Institut Fresnel (France); B. Bertussi, M. Pommies, A. Dyan, D. Damiani, H. Piombini, CEA Le Ripault (France) . . . . . [6403-57]

**A new expedited approach to evaluate the importance of different crystal growth parameters on the laser damage performance in KDP and DKDP**, R. A. Negres, N. P. Zaitseva, P. P. DeMange, S. G. Demos, Lawrence Livermore National Lab. . . . . [6403-58]

**Understanding the basic properties of damage precursors for optimizing conditioning in KDP and DKDP**, P. P. DeMange, R. A. Negres, H. B. Radousky, S. G. Demos, Lawrence Livermore National Lab. . . . . [6403-59]

**The effect of pulse duration on laser-induced bulk damage by 1053-nm light in potassium di-hydrogen phosphate crystals**, C. W. Carr, Lawrence Livermore National Lab. . . . . [6403-60]

**Characterization of KDP crystals used in large aperture doublers and triplers**, M. Barkauskas, A. Melnikaitis, D. Miksys, L. Meslinaite, R. Grigonis, V. Sirutkaitis, Vilnius Univ. (Lithuania); H. Bercegol, L. Lamaignère, CEA Cesta (France) [6403-61]

**Wednesday 27 September**

**Poster Placement at NIST . . . . . Wed. 07.30 to 08.30**

*Poster authors for the Tuesday poster session are to set-up their posters at this time.*

**SESSION 7 . . . . . Wed. 08.20 to 12.30**

**Materials and Measurements I**

**Chairs: Christopher J. Stolz**, Lawrence Livermore National Lab.; **Masataka Murahara**, Tokai Univ. (Japan)

**08.20: Optical characterization in laser damage studies (Invited Paper)**, M. Commandré, J. Natoli, L. Gallais, F. R. Wagner, C. Amra, Institut Fresnel (France) . . . . . [6403-62]

**09.00: IR thermoluminescence: the missing link to laser-induced damage in fused silica**, P. R. Bouchut, F. Milési, C. Da Maren, J. Coutard, CEA Grenoble (France) . . . . . [6403-63]

**09.20: In-situ observation of UV laser-induced deposit formation by fluorescence measurement**, H. B. Schroeder, German Aerospace Ctr. (Germany) and ESA/ESTEC (Netherlands) and CSMA Ltd. (United Kingdom); W. Riede, German Aerospace Ctr. (Germany); E. M. Reinhold, D. Wernham, Y. Lien, ESA/ESTEC (Netherlands); H. Kheyrandish, CSMA Ltd. (United Kingdom) . . . . . [6403-64]

**09.40: Measuring part per million thin film absorption during deposition**, G. Dubé, MetaStable Instruments, Inc.; A. J. Braundmeier, Jr., Southern Illinois Univ.; S. Chelli, Deposition Research Lab., Inc.; R. E. Juhala, A. N. Webb, MetaStable Instruments, Inc. . . . . [6403-65]

**Wednesday Poster Overview**

*10.00 to 10.30*

*All Materials and Measurements poster authors are asked to give 2-minute/2-viewgraph overviews of their posters in the order they appear in the program.*

**Poster Session and Refreshment Break . Wed. 10.30 to 11.30**

**SESSION 7 continued . . . . . Wed. 11.30 to 12.30**

**11.30: Results of sub-nanosecond laser-conditioning of DKDP crystals**, J. J. Adams, Lawrence Livermore National Lab. . . . . [6403-66]

**11.50: Laser conditioning of KDP crystals using excimer and Nd:YAG lasers**, B. Bertussi, D. Damiani, M. Pommies, A. Dyan, H. Piombini, X. Leborgne, CEA Le Ripault (France); A. Doring, L. Lamaignère, G. Gaborit, M. Loiseau, S. Mardelle, T. Donval, CEA Cesta (France) . . . . . [6403-67]

**12.10: Dynamics of bulk damage formation in KDP**, C. W. Carr, Lawrence Livermore National Lab. . . . . [6403-68]

Lunch Break . . . . . 12.30 to 14.00

**SESSION 8 . . . . . Wed. 14.00 to 17.40**

**Materials and Measurements II**

**Chairs: Detlev Ristau**, Laser Zentrum Hannover e.V. (Germany); **James E. Andrew**, AWE plc (United Kingdom)

**14.00: Temporal characterization of high-power ultrashort laser pulses based on the third-order cross-correlation function**, S. E. Egorov, C. C. Barnes, A. J. Carson, N. V. Didenko, A. V. Konyashchenko, Del Mar Photonics, Inc. [6403-69]

**14.20: The mechanism of ionization radiation-induced compaction in fused silica**, F. Piao, KLA-Tencor Corp. . . . . [6403-70]

**14.40: Nanosecond laser-induced breakdown in pure and Ytterbium-doped fused silica**, A. V. Smith, B. T. Do, Sandia National Labs. . . . . [6403-71]

**15.00: Photochemical adhesion of fused silica optical elements with no adhesive strain**, M. Murahara, Tokyo Institute of Technology (Japan) and Tokai Univ. (Japan); T. Funatsu, Tokyo Institute of Technology (Japan); Y. Okamoto, Okamoto Optics Works, Inc. (Japan) . . . . . [6403-72]

**Poster Session and Refreshment Break . . . . . 15.20 to 16.20**

**Important Dates**

**MANDATORY Online Meeting Registration: 6 September 2006**

**Hotel Reservations: 22 August 2006**

**Manuscript Due Date: 1 November 2006**

- 16.20: **Characterization of thin films and bulk materials for DUV optical components**, S. Schröder, M. Kamprath, A. Duparré, Fraunhofer-Institut für Angewandte Optik und Feinmechanik (Germany) ..... [6403-73]
- 16.40: **Damage of thermal detector platforms based on metal-carbon nanotube composites**, L. A. Lewis, C. L. Cromer, National Institute of Standards and Technology; R. L. Mahajan, Virginia Polytechnic Institute and State Univ.; K. Ramadurai, Univ. of Colorado/Boulder; J. H. Lehman, National Institute of Standards and Technology ..... [6403-74]
- 17.00: **Refractive microlens structures with high-damage thresholds enable flexible beam shaping of high-power lasers**, O. Homburg, L. Aschke, V. Lissotschenko, LIMO-Lissotschenko Mikrooptik GmbH (Germany) ..... [6403-75]
- 17.20: **High-reflectivity measurement with a broadband diode laser-based cavity ring-down technique**, Y. Gong, B. Li, Institute of Optics and Electronics (China) ..... [6403-76]

### Closing Remarks

*Chair:* **Arthur H. Guenther**, CHTM/The Univ. of New Mexico

### Poster Session

**Room 1** ..... **Wed. 10.30 to 11.30 and 15.20 to 16.20**

#### Materials and Measurements

- Laser damage investigation of RbTiOPO4 crystals coupled with optical characterization**, A. Hildenbrand, F. R. Wagner, Institut Fresnel (France); H. Albrecht, F. Theodore, Cristal Laser SA (France); J. Natoli, M. Commandre, Institut Fresnel (France) ..... [6403-77]
- Characterization of two-photon absorption related to the bulk quality in CaF2 crystal**, T. Kamimura, T. Kumada, Y. Ikeda, K. Yoshida, Osaka Institute of Technology (Japan); T. Okamoto, Okamoto Optics Work, Inc. (Japan); R. Nakamura, Osaka Univ. (Japan) ..... [6403-78]
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- Characterization of the mid-infrared nonlinear crystals LiInSe2 and LiInS2 in the IR range**, O. Balachninaite, L. Petraviciute, M. Maciulevicius, V. Sirutkaitis, Vilnius Univ. (Lithuania); L. I. Isaenko, S. Lobanov, A. P. Yelissev, Russian Academy of Sciences (Russia); J. Zondy, Observatoire de Paris (France) . [6403-81]
- Qualification of materials for application on optic systems in high-fluence lasers**, J. A. Pryatel, W. H. Gourdin, D. Behne, Lawrence Livermore National Lab. .... [6403-82]

### Poster Session

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#### Materials and Measurements

- Mitigation of laser damage on fused silica surfaces with a variable profile CO2 laser beam**, A. During, CEA Cesta (France); P. R. Bouchut, J. Coutard, CEA Grenoble (France); C. Leymarie, H. Bercegol, CEA Cesta (France) ..... [6403-83]
- Laser-induced damage thresholds of starched PMMA waveplates**, A. Melnikaitis, D. Mik\_ys, V. Sirutkaitis, Vilnius Univ. (Lithuania); G. Slekyas, Altechna Co. Ltd. (Lithuania); A. V. Samoylov, Institute of Semiconductor Physics (Ukraine) ..... [6403-85]
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## 2005 Award Winners

### Best Oral Paper

Toward an athermal HEL optical window: how to do it right (*Invited Paper*),  
C. A. Klein, C.A.K. Analytics, Inc. . . . . . [5991-13]

### Best Poster Paper

Thin-film polarizers for the OMEGA EP laser system, J. B. Oliver, A. L. Rigatti,  
J. D. Howe, J. C. Keck, J. Szczepanski, A. W. Schmid, S. Papernov, A. Kozlov,  
T. Z. Kosc, Univ. of Rochester . . . . . [5991-65]

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