
Publications and Conference Presentations

Publications

- V. Bagnoud, "A Front End for Multipetawatt Lasers Based on a High-Energy, High-Average-Power Optical Parametric Chirped-Pulsed Amplifier," in *Frontiers in Optics 2004* (Optical Society of America, Rochester, NY, 2004), Paper FMM2.
- V. Bagnoud, M. J. Guardalben, J. Puth, J. D. Zuegel, T. Mooney, and P. Dumas, "High-Energy, High-Average-Power Laser with Nd:YLF Rods Corrected by Magnetorheological Finishing," *Appl. Opt.* **44**, 282 (2005).
- R. Betti, K. Anderson, J. Knauer, T. J. B. Collins, R. L. McCrory, P. W. McKenty, and S. Skupsky, "Theory of Laser-Induced Adiabatic Shaping in Inertial Confinement Fusion Implosions: The Relaxation Method," *Phys. Plasmas* **12**, 042703 (2005).
- C. Bouvier, J. C. Lambropoulos, and S. D. Jacobs, "Fracture Toughness of ULE, Zerodur, Astrosital and Corning 9600," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OTuA4.
- J. Carpenter and S. D. Jacobs, "In the Mood for Science," SPIE's *oemagazine*, March 2005, 35.
- J. E. DeGroote, S. N. Shafir, J. C. Lambropoulos, and S. D. Jacobs, "Surface Characterization of CVD ZnS Using Power Spectral Density," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OTuC2.
- V. Yu. Glebov, C. Stoeckl, T. C. Sangster, S. Roberts, R. A. Lerche, and G. J. Schmid, "NIF Neutron Bang Time Detector Prototype Test on OMEGA," *IEEE Trans. Plasma Sci.* **33**, 70 (2005).
- J. E. Goldston, E. Quataert, and I. V. Igumenshchev, "Synchrotron Radiation from Radiatively Inefficient Accretion Flow Simulations: Applications to Sagittarius A*," *Astrophys. J.* **621**, 785 (2005).
- G. N. Gol'tsman, A. Korneev, I. Rubtsova, I. Milostnaya, G. Chulkova, O. Minaeva, K. Smirnov, B. Voronov, W. Slysz, A. Pearlman, A. Verevkin, and R. Sobolewski, "Ultrafast Superconducting Single-Photon Detectors for Near-Infrared-Wavelength Quantum Communications," *Phys. Stat. Sol. C* **2**, 1480 (2005).
- P. A. Jaanimagi, R. Boni, D. Butler, S. Ghosh, W. R. Donaldson, and R. L. Keck, "The Streak Camera Development Program at LLE," in the *26th International Congress on High-Speed Photography and Photonics*, edited by D. L. Paisley, S. Kleinfelder, D. R. Snyder, and B. J. Thompson (SPIE, Bellingham, WA, 2005), Vol. 5580, pp. 408–415.
- S. D. Jacobs, "Innovations in Optics Manufacturing," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OMA1.
- J. Keck, J. B. Oliver, V. Gruschow, J. Spaulding, and J. Howe, "Process Tuning of Silica Thin-Film Deposition," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OMB4.
- T. Z. Kosc, K. L. Marshall, A. Trajkovska-Petkoska, E. Kimball, and S. D. Jacobs, "Progress in the Development of Polymer Cholesteric Liquid Crystal Flakes for Display Applications," *Displays* **25**, 171 (2004).
- I. A. Kozhinova, H. J. Romanofsky, S. D. Jacobs, W. I. Kordonski, and S. R. Gorodkin, "Polishing of Pre-Polished CVD ZnS Flats with Altered Magnetorheological (MR) Fluids," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OMD2.

- A. P. Küng, A. Agarwal, D. F. Grosz, S. Banerjee, and D. N. Maywar, "Analytical Solution of Transmission Performance Improvement in Fiber Spans With Forward Raman Gain and Its Application to Repeaterless Systems," *J. Lightwave Technol.* **23**, 1182 (2005).
- S. Kurebayashi, J. A. Frenje, F. H. Séguin, J. R. Rygg, C. K. Li, R. D. Petrasso, V. Yu. Glebov, J. A. Delettrez, T. C. Sangster, D. D. Meyerhofer, C. Stoeckl, J. M. Soures, P. A. Amendt, S. P. Hatchett, and R. E. Turner, "Using Nuclear Data and Monte Carlo Techniques to Study Areal Density and Mix in D_2 Implosions," *Phys. Plasmas* **12**, 032703 (2005).
- J. C. Lambropoulos and R. Varshneya, "Glass Material Response to the Fabrication Process: Example from Lapping," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OTuA1.
- J. R. Marciante, J. I. Hirsh, D. H. Raguin, and E. T. Prince, "Polarization-Insensitive, High-Dispersion TIR Diffraction Gratings," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper DMA1.
- J. R. Marciante, J. I. Hirsh, D. H. Raguin, and E. T. Prince, "Polarization-Insensitive High-Dispersion Total Internal Reflection Diffraction Gratings," *J. Opt. Soc. Am. A* **22**, 299 (2005).
- A. E. Marino, K. Spencer, J. E. DeGroot, and S. D. Jacobs, "Chemical Durability of Phosphate Laser Glasses," in *Frontiers in Optics 2004*, OSA Technical Digest (Optical Society of America, Rochester, NY, 2004), Paper OTuA7.
- M. J. Moran, V. Yu. Glebov, C. Stoeckl, R. Rygg, and B.-E. Schwartz, "PROTEX: A Proton-Recoil Detector for Inertial Confinement Fusion Neutrons," *Rev. Sci. Instrum.* **76**, 023506 (2005).
- F. H. Mrakovcic, J. A. Randi, J. C. Lambropoulos, and S. D. Jacobs, "Subsurface Damage in Single-Crystal Sapphire," in *Frontiers in Optics 2004* (Optical Society of America, Rochester, NY, 2004), Paper OTuA6.
- J. B. Oliver, "Thin-Film-Optics Design and Manufacturing Challenges for Large-Aperture High-Peak-Power, Short-Pulse Lasers," in *Frontiers in Optics 2004* (Optical Society of America, Rochester, NY, 2004), Paper OMB1.
- S. Papernov and A. W. Schmid, "High-Spatial-Resolution Studies of UV-Laser-Damage Morphology in SiO_2 Thin Films with Artificial Defects," in *Laser-Induced Damage in Optical Materials: 2004*, edited by G. J. Exarhos, A. H. Guenther, N. Kaiser, K. L. Lewis, M. J. Soileau, and C. J. Stolz (SPIE, Bellingham, WA, 2005), Vol. 5647, pp. 141–155.
- P. B. Radha, V. N. Goncharov, T. J. B. Collins, J. A. Delettrez, Y. Elbaz, V. Yu. Glebov, R. L. Keck, D. E. Keller, J. P. Knauer, J. A. Marozas, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. P. Regan, T. C. Sangster, D. Shvarts, S. Skupsky, Y. Srebro, R. P. J. Town, and C. Stoeckl, "Two-Dimensional Simulations of Plastic-Shell, Direct-Drive Implosions on OMEGA," *Phys. Plasmas* **12**, 032702 (2005).
- R. Rey-de-Castro, D. Wang, A. Verevkin, A. Mycielski, and R. Sobolewski, " $Cd_{1-x}Mn_xTe$ Semimagnetic Semiconductors for Ultrafast Spintronics and Magneto-optics," *IEEE Trans. Nanotech.* **4**, 106 (2005).
- A. Rigatti, "Cleaning Process Versus Laser Damage Threshold of Coated Optical Components," in *Frontiers in Optics 2004* (Optical Society of America, Rochester, NY, 2004), Paper OMB3.
- A. L. Rigatti, "Cleaning Process Versus Laser-Damage Threshold of Coated Optical Components," in *Laser-Induced Damage in Optical Materials: 2004*, edited by G. J. Exarhos, A. H. Guenther, N. Kaiser, K. L. Lewis, M. J. Soileau, and C. J. Stolz (SPIE, Bellingham, WA, 2005), Vol. 5647, pp. 136–140.
- J. Sanz and R. Betti, "Analytical Model of the Ablative Rayleigh–Taylor Instability in the Deceleration Phase," *Phys. Plasmas* **12**, 042704 (2005).
- S. N. Shafirir, J. C. Lambropoulos, and S. D. Jacobs, "Loose Abrasive Lapping of Optical Glass with Different Lapping Plates and Its Interpretation," in *Frontiers in Optics 2004* (Optical Society of America, Rochester, NY, 2004), Paper OMC4.
- A. Trajkovska-Petkoska, R. Varshneya, T. Z. Kosc, K. L. Marshall, and S. D. Jacobs, "Enhanced Electro-Optic Behavior for Shaped Polymer Cholesteric Liquid-Crystal Flakes Made Using Soft Lithography," *Adv. Funct. Mater.* **15**, 217 (2005).

N. G. Usechak and G. P. Agrawal, "Semi-Analytic Technique for Analyzing Mode-Locked Lasers," *Opt. Express* **13**, 2075 (2005).

T. Yasuda, K. Fujita, T. Tsutsui, Y. Geng, S. W. Culligan, and S. H. Chen, "Carrier Transport Properties of Monodisperse Glassy-Nematic Oligofluorenes in Organic Field-Effect Transistors," *Chem. Mater.* **17**, 264 (2005).

J. D. Zuegel, V. Bagnoud, T. Corso, P. Drew, G. J. Quarles, P. Dumas, J. T. Mooney, and S. D. O'Donohue, "Wavefront Correction Extends the Capabilities of Large-Aperture Nd:YLF Laser Rods," *Laser Focus World* **41**, 133 (2005).

Forthcoming Publications

V. Bagnoud, I. A. Begishev, M. J. Guardalben, J. Puth, and J. D. Zuegel, "A 5-Hz, 250-mJ Optical Parametric Chirped-Pulse Amplifier at 1053 nm with New Ideal Performance," to be published in *Optics Letters*.

D. Clay, D. Poslunsky, M. Flinders, S. D. Jacobs, and R. Cutler, "Effect of LiAl_5O_8 Additions on the Sintering and Optical Transparency of LiAlON," to be published in the *Journal of European Ceramic Society*.

T. J. B. Collins, A. Poludnenko, A. Cunningham, and A. Frank, "Shock Propagation in Deuterium-Tritium-Saturated Foam," to be published in *Physics of Plasmas*.

S. Costea, S. Pisana, N. P. Kherani, F. Gaspari, T. Koteski, W. T. Shmayda, and S. Zukotynski, "The Use of Tritium in the Study of Defects in Amorphous Silicon," to be published in the *Journal of Fusion Science and Technology*.

R. S. Craxton and D. W. Jacobs-Perkins, "The Saturn Target for Polar Direct Drive on the National Ignition Facility," to be published in *Physical Review Letters*.

R. S. Craxton, F. J. Marshall, M. J. Bonino, R. Epstein, P. W. McKenty, S. Skupsky, J. A. Delettrez, I. V. Igumenshchev, D. W. Jacobs-Perkins, J. P. Knauer, J. A. Marozas, P. B. Radha, and W. Seka, "Polar Direct Drive: Proof-of-Principle Experiments on OMEGA and Prospects for Ignition on the National Ignition Facility," to be published in *Physics of Plasmas* (invited).

V. N. Goncharov and D. Li, "Effects of Temporal Density Variation and Convergent Geometry on Nonlinear Bubble in Classical Rayleigh-Taylor Instability," to be published in *Physical Review E*.

L. Guazzotto, R. Betti, J. Manickam, S. Kaye, and J. L. Gauvreau, "Magnetohydrodynamics Equilibria with Toroidal and Poloidal Flow," to be published in *Physics of Plasmas* (invited).

D. R. Harding, F.-Y. Tsai, E. L. Alfonso, S. H. Chen, A. K. Knight, and T. N. Blanton, "Properties of Vapor-Deposited Polyimide Films," to be published in the *Journal of Adhesion Science and Technology* (invited).

J. Kitaygorsky, J. Zhang, A. Verevkin, A. Sergeev, A. Korneev, V. Matvienko, P. Kouminov, K. Smirnov, B. Voronov, G. Gol'tsman, and R. Sobolewski, "Origin of Dark Counts in Nanostructured NbN Single-Photon Detectors," to be published in *IEEE Transactions on Applied Superconductivity*.

J. P. Knauer, K. Anderson, P. B. Radha, R. Betti, T. J. B. Collins, V. N. Goncharov, P. W. McKenty, D. D. Meyerhofer, S. P. Regan, T. C. Sangster, and V. A. Smalyuk, "Improved Target Stability Using Picket Pulses to Increase and Shape the Ablator Adiat," to be published in *Physics of Plasmas* (invited).

A. Korneev, V. Matvienko, O. Minaeva, I. Milostnaya, I. Rubtsova, G. Chulkova, K. Smirnov, V. Voronov, G. Gol'tsman, W. Slys, A. Pearlman, A. Verevkin, and R. Sobolewski, "Quantum Efficiency and Noise Equivalent Power of Nanostructured, NbN, Single-Photon Detectors in the Wavelength Range from Visible to Infrared," to be published in *IEEE Transactions on Applied Superconductivity*.

T. Koteski, N. P. Kherani, W. T. Shmayda, S. Costea, and S. Zukotynski, "Nuclear Batteries Using Tritium and Thin-Film Hydrogenated Amorphous Silicon," to be published in the *Journal of Fusion Science and Technology*.

I. A. Kozhinova, H. J. Romanofsky, A. Maltsev, S. D. Jacobs, W. I. Kordonski, and S. R. Gorodkin, "Minimizing Artifact Formation in Magnetorheological Finishing of CVD ZnS Flats," to be published in *Applied Optics*.

X. Li, Y. Xu, S. Chromik, V. Strbík, P. Odier, D. De Barros, and R. Sobolewski, "Time-Resolved Carrier Dynamics in Hg-Based High-Temperature Superconducting Photodetectors," to be published in *IEEE Transactions on Applied Superconductivity*.

A. E. Marino, K. E. Spencer, J. E. DeGroot, K. L. Marshall, A. L. Rigatti, and S. D. Jacobs, "Chemical Durability of Phosphate Laser Glasses Polished with Pitch, Pads, or MRF," to be published in *Applied Optics*.

F. J. Marshall, R. S. Craxton, J. A. Delettrez, D. H. Edgell, L. M. Elasky, R. Epstein, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, R. Janezic, R. L. Keck, J. D. Kilkenny, J. P. Knauer, S. J. Loucks, L. D. Lund, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, P. B. Radha, S. P. Regan, T. C. Sangster, W. Seka, V. A. Smalyuk, J. M. Soures, C. Stoeckl, S. Skupsky, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Direct-Drive, Cryogenic Target Implosions on OMEGA," to be published in *Physics of Plasmas* (invited).

R. L. McCrory, S. P. Regan, R. Betti, T. R. Boehly, R. S. Craxton, T. J. B. Collins, J. A. Delettrez, R. Epstein, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, R. L. Keck, J. P. Knauer, S. J. Loucks, J. Marciante, J. A. Marozas, F. J. Marshall, A. Maximov, P. W. McKenty, D. D. Meyerhofer, J. Myatt, P. B. Radha, T. C. Sangster, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, B. Yaakobi, J. D. Zuegel, C. K. Li, R. D. Petrasso, F. H. Séguin, J. A. Frenje, S. Padalino, C. Freeman, and K. Fletcher, "Direct-Drive Inertial Confinement Fusion Research at the Laboratory for Laser Energetics: Charting the Path to Thermonuclear Ignition," to be published in *Nuclear Fusion*.

J.-R. Park, W. R. Donaldson, and R. Sobolewski, "Time-Resolved Imaging of a Spatially Modulated Laser Pulse," to be published in *SPIE's Proceedings of LASE 2004*.

S. Papernov and A. W. Schmid, "Two Mechanisms of Crater Formation in Ultraviolet-Pulsed, Laser-Irradiated SiO₂ Thin Films with Artificial Defects," to be published in the *Journal of Applied Physics*.

A. Pearlman, A. Cross, W. SBysz, J. Zhang, A. Verevkin, M. Currie, A. Korneev, P. Kouminov, K. Smirnov, B. Voronov, G. Gol'tsman, and R. Sobolewski, "Gigahertz Counting Rates of NbN Single-Photon Detectors for Quantum Communications," to be published in *IEEE Transactions on Applied Superconductivity*.

P. B. Radha, T. J. B. Collins, J. A. Delettrez, Y. Elbaz, R. Epstein, V. Yu. Glebov, V. N. Goncharov, R. L. Keck, J. P. Knauer, J. A. Marozas, F. J. Marshall, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, S. P. Regan, T. C. Sangster, W. Seka, D. Shvarts, S. Skupsky, Y. Srebro, and C. Stoeckl, "Multidimensional Analysis of Direct-Drive Plastic-Shell Implosions on OMEGA," to be published in *Physics of Plasmas* (invited).

J. A. Randi, J. C. Lambropoulos, and S. D. Jacobs, "Subsurface Damage in Single Crystalline Optical Materials," to be published in *Applied Optics*.

S. P. Regan, J. A. Marozas, R. S. Craxton, J. H. Kelly, W. R. Donaldson, P. A. Jaanimagi, D. Jacobs-Perkins, R. L. Keck, T. J. Kessler, D. D. Meyerhofer, T. C. Sangster, W. Seka, V. A. Smalyuk, S. Skupsky, and J. D. Zuegel, "Performance of a 1-THz-Bandwidth, 2-D Smoothing by Spectral Dispersion and Polarization Smoothing of High-Power, Solid-State Laser Beams," to be published in the *Journal of the Optical Society of America B*.

S. P. Regan, T. C. Sangster, D. D. Meyerhofer, K. Anderson, R. Betti, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, R. Epstein, O. V. Gotchev, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, P. A. Jaanimagi, J. P. Knauer, S. J. Loucks, L. D. Lund, J. A. Marozas, F. J. Marshall, R. L. McCrory, P. W. McKenty, S. F. B. Morse, P. B. Radha, W. Seka, S. Skupsky, H. Sawada, V. A. Smalyuk, J. M. Soures, C. Stoeckl, B. Yaakobi, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Direct-Drive Inertial Confinement Fusion Implosions on OMEGA," to be published in *Astrophysics and Space Science*.

V. A. Smalyuk, J. A. Delettrez, S. B. Dumanis, R. Epstein, V. Yu. Glebov, D. D. Meyerhofer, P. B. Radha, T. C. Sangster, C. Stoeckl, N. C. Toscano, J. A. Frenje, C. K. Li, R. D. Petrasso, F. H. Séguin, and J. H. Koch, "Hot-Core Characterization of the Cryogenic D₂ Target at Peak Neutron Production in Direct-Drive Spherical Implosion," to be published in *Physics of Plasmas*.

V. A. Smalyuk, V. N. Goncharov, T. R. Boehly, J. A. Delettrez, D. Y. Li, J. A. Marozas, D. D. Meyerhofer, S. P. Regan, and T. C. Sangster, "Angular Dependence of Imprinting Levels in Laser-Target Interactions on Planar CH Foils," to be published in *Physics of Plasmas*.

Y. Wang and H. Yang, "Synthesis of CoPt Nanorods in Ionic Liquids," to be published in the *Journal of the American Chemical Society*.

D. Wang, A. Verevkin, R. Sobolewski, R. Adam, A. van der Hart, and R. Franchy, "Magneto-Optical Kerr Effect Measurements and Ultrafast Coherent Spin Dynamics in Co Nano-Dots," to be published in *IEEE Transactions on Nanotechnology*.

Conference Presentations

H. L. Helfer, "The Dark Matter of Galactic Halos," 205th Meeting of the American Astronomical Society, San Diego, CA, 9–13 January 2005.

R. Betti, K. Anderson, J. P. Knauer, and V. N. Goncharov, "Hydrodynamics of Inertial Confinement Fusion Implosions: What's Next?" 25th International Workshop on Physics of High Density in Matter, Hirschegg, Austria, 30 January–4 February 2005.

K. L. Marshall, T. Z. Kosc, A. Trajkovska-Petkoska, E. Kimball, and S. D. Jacobs, "Polymer Cholesteric Liquid Crystal (PCLC) Flake/Fluid Host Electro-Optic Suspensions and Their Applications in Flexible Reflective Displays," 4th Annual Flexible Microelectronics and Displays Conference, Phoenix, AZ, 1–3 February 2005.

P. B. Radha, "Direct-Drive Inertial Confinement Fusion: Status and Future," AAAS Annual Meeting, Washington, DC, 17–21 February 2005.

The following presentations were made at JOWOG 37, Albuquerque, NM, 21–25 February 2005:

D. D. Meyerhofer, B. Yaakobi, T. R. Boehly, T. J. B. Collins, H. Lorenzana, B. A. Remington, P. G. Allen, S. M. Pollaine, J. J. Rehr, and R. C. Albers, "Dynamic EXAFS Probing of Laser-Driven Shock Waves and Crystal Phase Transformations."

T. C. Sangster, T. R. Boehly, D. D. Meyerhofer, T. J. B. Collins, P. M. Celliers, G. W. Collins, J. H. Eggert, and D. G. Hicks, "Recent Results from EOS Experiments of Low-Density Foams and D₂."

R. L. McCrory, D. D. Meyerhofer, S. J. Loucks, S. Skupsky, J. M. Soures, R. Betti, T. R. Boehly, M. J. Bonino, R. S. Craxton, T. J. B. Collins, J. A. Delettrez, D. H. Edgell, R. Epstein, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, R. L. Keck, J. H. Kelly, J. P. Knauer, L. D. Lund, D. Jacobs-Perkins, J. R. Marciante, J. A. Marozas, F. J. Marshall, A. V. Maximov, P. W. McKenty, S. F. B. Morse, J. Myatt, S. G. Noyes, P. B. Radha, T. C. Sangster, W. Seka, V. A. Smalyuk, C. Stoeckl, K. A. Thorp, M. D. Wittman, B. Yaakobi, J. D. Zuegel, K. A. Fletcher, C. Freeman, S. Padalino, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Direct-Drive Inertial Confinement Fusion Research at the Laboratory for Laser Energetics," 6th Symposium on Current Trends in International Fusion Research: A Review, Washington, DC, 7–11 March 2005.