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## Publications and Conference Presentations

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### Publications

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E. L. Alfonso, I. Anteby, and D. R. Harding, "Temperature Profiles and  $\ell = 1$  Nonuniformity Within Cryogenic ICF Targets," *Fusion Technol.* **38**, 149 (2000).

A. Babushkin, M. J. Guardalben, R. S. Craxton, P. Adamson, H. Ammenheuser, R. L. Keck, and W. Seka, "Characterization of Frequency-Conversion Crystals for the Implementation of a 1-THz Bandwidth on the OMEGA Laser," in *Conference on Lasers and Electro-Optics*, 2000 Technical Digest Series (Optical Society of America, Washington, DC, 2000), pp. 290–291.

T. R. Boehly, D. D. Meyerhofer, Y. Fisher, W. Seka, and D. K. Bradley, "Measurements of the Optical Contrast on OMEGA: a 60-Beam, 30-kJ UV Fusion Laser," in *Conference on Lasers and Electro-Optics*, 2000 Technical Digest Series (Optical Society of America, Washington, DC, 2000), p. 539.

H. P. Chen, D. Katsis, J. C. Mastrangelo, S. H. Chen, S. D. Jacobs, and P. J. Hood, "Glassy Liquid-Crystal Films with Opposite Chirality as High-Performance Optical Notch Filters and Reflectors," *Adv. Mat.* **12**, 1283 (2000).

H. P. Chen, D. Katsis, J. C. Mastrangelo, K. L. Marshall, S. H. Chen, and T. H. Mourey, "Thermotropic Chiral-Nematic Poly(*p*-phenylene)s as a Paradigm of Helically Stacked  $\pi$ -Conjugated Systems," *Chem. Mater.* **12**, 2275 (2000).

F. Y. Fan, J. C. Mastrangelo, D. Katsis, and S. H. Chen, "Novel Glass-Forming Liquid Crystals: V. Nematic and Chiral-Nematic Systems with an Elevated Glass Transition Temperature," *Liq. Cryst.* **27**, 1239 (2000).

M. J. Guardalben and N. Jain, "Phase-Shift Error as a Result of Molecular Alignment Distortions in a Liquid-Crystal Point-Diffraction Interferometer," *Opt. Lett.* **25**, 1171 (2000).

S. D. Jacobs, "Take-Home Demo Excites Young People About Careers in Technology," *Opt. Photonics News*, 16 (July 2000).

S. D. Jacobs and A. B. Shorey, "Magnetorheological Finishing: New Fluids for New Materials," in *Optical Fabrication and Testing*, OSA Technical Digest (Optical Society of America, Washington, DC, 2000), pp. 142–144 (invited).

I. Kozhinova, S. Jacobs, S. Arrasmith, and L. Gregg, "Corrosion in Aqueous Cerium Oxide Magnetorheological Fluids," in *Optical Fabrication and Testing*, OSA Technical Digest (Optical Society of America, Washington, DC, 2000), pp. 151–153.

P. W. McKenty, M. D. Wittman, and V. N. Goncharov, "Characterization of Thick Cryogenic Fuel Layers Using Convergent-Beam Interferometry: a Numerical Investigation," *J. Appl. Phys.* **88**, 2928 (2000).

A. V. Okishev, R. Boni, M. Millecchia, B. Kubera, P. A. Jaanimagi, W. R. Donaldson, R. L. Keck, W. Seka, K. V. Dukelsky, M. A. Eronyan, G. A. Shevandin, and G. A. Ermolaev, "A Unique High-Bandwidth, Multimode UV Optical Fiber: Manufacturing, Testing, and Laser-Fusion Applications," in *Conference on Lasers and Electro-Optics*, 2000 Technical Digest Series (Optical Society of America, Washington, DC, 2000), pp. 292–293.

J. D. Schnittman and R. S. Craxton, "Three-Dimensional Modeling of Capsule Implosions in OMEGA Tetrahedral Hohlräume," *Phys. Plasmas* **7**, 2964 (2000).

A. B. Shorey and S. D. Jacobs, "Nanohardness of Abrasive Particles Used in Magnetorheological Finishing (MRF)," in *Optical Fabrication and Testing*, OSA Technical Digest (Optical Society of America, Washington, DC, 2000), pp. 145–147.

M. D. Skeldon, "A High-Bandwidth Electrical Waveform Generator Based on an Aperture-Coupled Stripline," *Rev. Sci. Instrum.* **71**, 3559 (2000).

R. Sobolewski, "Time-Resolved Nonequilibrium Phenomena in High-Temperature Superconductors," in *Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Quantum Systems*, Recountres du Vietnam, edited by N. Van Hieu, T. Thanh Van, and G. Xiao (Vietnam National University Press, Hanoi, 2000), pp. 55–66 (invited).

F.-Y. Tsai, E. L. Alfonso, S. H. Chen, and D. R. Harding, "Mechanical Properties and Gas Permeability of Polyimide

Shells Fabricated by the Vapor Deposition Method," *Fusion Technol.* **38**, 83 (2000).

B. Yaakobi, V. A. Smalyuk, J. A. Delettrez, F. J. Marshall, D. D. Meyerhofer, and W. Seka, "Measurement of Areal Density Modulation of Laser-Imploded Shells Through K-Edge Imaging," *Phys. Plasmas* **7**, 3727 (2000).

B. Yaakobi, C. Stoeckl, T. Boehly, D. D. Meyerhofer, and W. Seka, "Measurement of Preheat Due to Fast Electrons in Laser Implosions," *Phys. Plasmas* **7**, 3714 (2000).

### Forthcoming Publications

S. R. Arrasmith, S. D. Jacobs, I. A. Kozhinova, A. B. Shorey, D. Golini, W. I. Kordonski, S. Hogan, and P. Dumas, "Development and Characterization of Magnetorheological Fluids for Optical Finishing," to be published in the Proceedings of Fine Powder Processing '99, University Park, PA, 20–22 September 1999.

A. Babushkin, M. J. Harvey, and M. D. Skeldon, "The Output Signal-to-Noise Ratio of a Nd:YLF Regenerative Amplifier," to be published in *Applied Optics*.

R. Betti and J. P. Freidberg, "Low- $\beta$ , Magnetohydrodynamic Tokamak Equilibria with Poloidal Transonic Flow," to be published in *Physical Review Letters*.

T. R. Boehly, A. Babushkin, D. K. Bradley, R. S. Craxton, J. A. Delettrez, R. Epstein, T. J. Kessler, J. P. Knauer, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, S. Regan, W. Seka, S. Skupsky, V. A. Smalyuk, R. P. J. Town, and B. Yaakobi, "Laser-Uniformity and Hydrodynamic-Stability Experiments at the OMEGA Laser Facility," to be published in *Laser and Particle Beams*.

T. R. Boehly, J. A. Delettrez, J. P. Knauer, D. D. Meyerhofer, B. Yaakobi, R. P. J. Town, and D. Hoarty, "The Effect of Target Isentrope on the Stability of Laser-Driven Targets," to be published in *Physical Review Letters*.

T. R. Boehly, Y. Fisher, D. D. Meyerhofer, W. Seka, J. M. Soures, and D. K. Bradley, "The Effect of Optical Prepulse on Direct-Drive Inertial Confinement Fusion Target Performance," to be published in *Physics of Plasmas*.

T. R. Boehly, V. N. Goncharov, O. Gotchev, J. P. Knauer, D. D. Meyerhofer, D. Oron, S. P. Regan, Y. Srebro, W. Seka, D. Shvarts, S. Skupsky, and V. A. Smalyuk, "The Effect of Plasma Formation Rate and Beam Smoothing on Laser Imprinting," to be published in *Physical Review Letters*.

B. Buerke and D. D. Meyerhofer, "Accurate Measurement of Hydrogenic Tunneling Rates in a High-Intensity Laser Focus," to be published in *Physical Review Letters*.

D. P. Butler, Z. Celik-Butler, and R. Sobolewski, "Y-Ba-Cu-O as an Infrared Radiation Sensing Material," to be published in the *Handbook of Advanced Electronic and Photonic Materials* (Academic Press, NY).

J. A. Frenje, D. G. Hicks, C. K. Li, F. H. Séguin, R. D. Petrasso, K. Fletcher, H. Olliver, S. Padalino, S. Thompson, J. M. Soures, S. Roberts, C. Sorce, T. C. Sangster, and T. W. Phillips, "CR-39 Tract Detector Response to Charged Particles and Neutrons," to be published in the *Review of Scientific Instruments*.

V. Yu. Glebov, D. D. Meyerhofer, C. Stoeckl, and J. D. Zuegel, "Secondary Neutron Yield Measurements by Current Mode Detectors," to be published in the Review of Scientific Instruments.

W. Göb, W. Liebich, W. Lang, I. Puica, R. Sobolewski, R. Rossler, J. D. Pedarnig, and D. Bauerle, "Double Sign Reversal of the Vortex Hall Effect in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  Thin Films in the Strong Pinning Limit of Low Magnetic Fields," to be published in Physical Review B.

G. N. Gol'tsman, O. Okunev, G. Chulkova, A. Dzardanov, A. Lipatov, A. Semenov, K. Smirnov, B. Voronov, G. Chulkova, C. Williams, and R. Sobolewski, "Picosecond Superconducting Single-Photon Optical Detector," to be published in Applied Physics Letters.

V. N. Goncharov, P. W. McKenty, S. Skupsky, R. P. J. Town, R. Betti, and C. Cherfils-Clérouin, "Modeling Hydrodynamic Instabilities in Inertial Confinement Fusion Targets," to be published in Physics of Plasmas.

K. Green and R. Sobolewski, "Extending Scattering Parameter Approach to Characterization of Linear Time-Varying Microwave Devices," to be published in IEEE Transactions on Microwave Theory and Techniques.

P. A. Jaanimagi, R. Boni, and R. L. Keck, "Neutron-Induced Background in CCD Detectors," to be published in the Review of Scientific Instruments.

D. Katsis, H. P. Chen, S. H. Chen, L. J. Rothberg, and T. Tsutsui, "Polarized Photoluminescence from Solid Films of Nematic and Chiral-Nematic Poly(*p*-phenylene)s," to be published in Applied Physics Letters.

C. K. Li, D. G. Hicks, F. H. Séguin, J. Frenje, R. D. Petrasso, J. M. Soures, P. B. Radha, V. Yu. Glebov, C. Stoeckl, J. P. Knauer, F. J. Marshall, D. D. Meyerhofer, S. Skupsky, S. Roberts, C. Sorce, T. C. Sangster, T. W. Phillips, and M. D. Cable, "Measuring Fusion Yields, Areal Densities, and Ion Temperatures of Imploded Capsules at OMEGA," to be published in the Review of Scientific Instruments.

V. Lobatchev and R. Betti, "Ablative Stabilization of the Deceleration Phase Rayleigh–Taylor Instability," to be published in Physical Review Letters.

F. J. Marshall, T. A. Ohki, D. McInnis, Z. Ninkov, and J. Carbone, "Imaging of Laser-Plasma X-Ray Emission with Charge Injection Devices (CID)," to be published in the Review of Scientific Instruments.

A. V. Okishev, R. Boni, M. Millecchia, P. A. Jaanimagi, W. R. Donaldson, R. L. Keck, W. Seka, K. V. Dukelsky, M. A. Eronyan, V. S. Shevandin, G. A. Ermolaeva, G. Nikolaev, and V. B. Shilov, "Unique High-Bandwidth, UV Fiber Delivery System for the OMEGA Diagnostic Applications," to be published in the IEEE Journal on Selected Topics in Quantum Electronics.

A. V. Okishev, M. D. Skeldon, R. L. Keck, and W. Seka, "A New High-Bandwidth, All Solid-State Pulse-Shaping System for the OMEGA Laser Facility," to be published in SPIE's Proceedings of Laser Optics 2000.

S. P. Regan, J. A. Marozas, J. H. Kelly, T. R. Boehly, W. R. Donaldson, P. A. Jaanimagi, R. L. Keck, T. J. Kessler, D. D. Meyerhofer, W. Seka, S. Skupsky, and V. A. Smalyuk, "Experimental Investigation of Smoothing by Spectral Dispersion," to be published in the Journal of the Optical Society of America B.

F. H. Séguin, C. K. Li, D. G. Hicks, J. A. Frenje, R. D. Petrasso, J. M. Soures, V. Yu. Glebov, C. Stoeckl, P. B. Radha, D. D. Meyerhofer, S. Roberts, C. Sorce, T. C. Sangster, and M. D. Cable, "Diagnostic Use of Secondary D-<sup>3</sup>He Proton Spectra for D-D OMEGA Targets," to be published in Physics of Plasmas.

A. B. Shorey, S. D. Jacobs, W. I. Kordonski, and R. F. Gans, "Understanding the Mechanism of Glass Removal in Magnetorheological Finishing (MRF)," to be published in Applied Optics.

A. B. Shorey, K. M. Kwong, K. M. Johnson, and S. D. Jacobs, "Nanoindentation Hardness of Particles Used in Magnetorheological Finishing (MRF)," to be published in Applied Optics.

R. W. Short, "Stability of Self-Focused Filaments in Laser-Produced Plasmas," to be published in Physical Review Letters.

S. Skupsky, R. L. McCrory, R. E. Bahr, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, V. N. Goncharov, R. Q. Gram, D. R. Harding, P. A. Jaanimagi, R. L. Keck, J. P. Knauer, S. J. Loucks, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, O. V. Gotchev, P. B. Radha, S. P. Regan, W. Seka, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, M. D. Wittman, B. Yaakobi, J. D. Zuegel, R. D. Petrasso, D. G. Hicks, and C. K. Li, "Recent Progress in Direct-Drive ICF Research at the Laboratory for Laser Energetics," to be published in SPIE's Proceedings of the XXVI European Conference on Laser Interaction with Matter.

V. A. Smalyuk, T. R. Boehly, L. S. Iwan, T. J. Kessler, J. P. Knauer, F. J. Marshall, D. D. Meyerhofer, C. Stoeckl, B. Yaakobi, and D. K. Bradley, "Fourier-Space Image Processing for Spherical Experiments on OMEGA," to be published in the Review of Scientific Instruments.

V. A. Smalyuk, B. Yaakobi, J. A. Delettrez, F. J. Marshall, and D. D. Meyerhofer, "Compressed-Shell Integrity Measurements in Spherical Implosion Experiments," to be published in Physics of Plasmas.

V. A. Smalyuk, B. Yaakobi, F. J. Marshall, and D. D. Meyerhofer, "X-Ray Spectroscopic Measurements of Areal Density and Modulations in Areal Density of Cold Compressed Shells in Implosion Experiments on OMEGA," to be published in the Proceedings of the 12th Topical Conference on Atomic Processes in Plasmas, Reno, NV, 19–23 March 2000.

D. J. Smith, J. A. Warner, N. E. LeBarron, T. J. Kessler, and S. LaDelia, "The Development of Ion-Etched Phase Plates," to be published in Applied Optics.

C. Stoeckl, V. Yu Glebov, D. D. Meyerhofer, W. Seka, B. Yaakobi, R. P. J. Town, and J. D. Zuegel, "Hard X-Ray Detectors for OMEGA and NIF," to be published in the Review of Scientific Instruments.

F.-Y. Tsai, E. L. Alfonso, S. H. Chen, and D. R. Harding, "Mechanical Properties and Gas Permeability of Polyimide Shells Fabricated by the Vapor Deposition Method," to be published in Fusion Technology.

B. Yaakobi, C. Stoeckl, T. R. Boehly, D. D. Meyerhofer, and W. Seka, "Measurement of Preheat due to Fast Electrons in Laser Implosions," to be published in SPIE's Proceedings of the XXVI European Conference on Laser Interaction with Matter.

J. D. Zuegel and D. W. Jacobs-Perkins, "An Efficient, High-Frequency Bulk Phase Modulator," to be published in Applied Optics.

J. D. Zuegel and S. A. Letzring, "Bulk Microwave Phase Modulators for Smoothing by Spectral Dispersion," to be published in Applied Optics.

### Conference Presentations

R. Sobolewski, D. P. Butler, and Z. Celik-Butler, "Cooled and Uncooled Infrared Detectors Based on Yttrium Barium Copper Oxide," SPIE Baltic States Conference on Advanced Optical Materials (ADOM-2), Vilnius, Lithuania, 16–19 August 2000 (invited).

The following presentations were made at the Applied Superconductivity Conference (ASC), Virginia Beach, VA, 17–22 September 2000:

R. Adam, C. Williams, R. Sobolewski, J. Scherbel, M. Darula, and M. Siegel, "Experiments and Simulations of Subpicosecond SFQ Pulse Propagation in Y-Ba-Cu-O Josephson Transmission Lines."

G. Gol'tsman, O. Okunev, G. Chulkova, A. Lipatov, A. Dzardanov, K. Smirnov, A. Semenov, B. Voronov, C. Williams, and R. Sobolewski, "Fabrication and Properties of an Ultrafast NbN Hot-Electron Single-Photon Detector."

R. Sobolewski and J.-R. Park, "Magneto-Optical Modulator for Superconducting Digital Output Interface."

C. Williams, R. Adam, Y. Xu, R. Sobolewski, J. Scherbel, O. Harnack, M. Darula, and F. A. Hegmann, "Ultrafast Y-Ba-Cu-O Photodetector Based on the Nonequilibrium Kinetic Inductive Effect."