
Publications and Conference Presentations

Publications

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," *Laser Part. Beams* **18**, 11 (2000).

W. Göb, W. Liebich, W. Lang, I. Puica, R. Sobolewski, R. Rössler, J. D. Pedarnig, and D. Bäuerle, "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," *Phys. Rev. B* **62**, 9780 (2000).

K. Green and R. Sobolewski, "Extending Scattering-Parameter Approach to Characterization of Linear Time-Varying Microwave Devices," *IEEE Trans. Microw. Theory Tech.* **48**, 1725 (2000).

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," *Appl. Phys. Lett.* **77**, 2982 (2000).

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, S. Skupsky, 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, "OMEGA Experiments and Preparation for Moderate-Gain Direct-Drive Experiments on NIF," in *C. R. Acad. Sci. Paris*, t.1, Série IV (Elsevier, Amsterdam, 2000), pp. 681–691.

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," *J. Opt. Soc. Am. B* **17**, 1483 (2000).

A. B. Shorey, K. M. Kwong, K. M. Johnson, and S. D. Jacobs, "Nanoindentation Hardness of Particles Used in Magneto-rheological Finishing (MRF)," *App. Opt.* **39**, 5194 (2000).

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 Compressed Shells in Implosion Experiments on OMEGA," in *Atomic Processes in Plasmas: Twelfth Topical Conf.*, edited by R. C. Mancini and R. A. Phaneuf (American Institute of Physics, New York, 2000), pp. 15–24.

Forthcoming Publications

R. Adam, R. Sobolewski, and M. Darula, "Subpicosecond Dynamics of the Switching Process in Y-Ba-Cu-O Josephson Junctions," to be published in *Oxide Superconductors: Physics and Nano-engineering IV*.

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- β , Magnetohydrodynamic Tokamak Equilibria with Poloidal Transonic Flow," 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*.

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).

T. J. B. Collins and S. Skupsky, "Imprint Reduction Using an Intensity Spike in OMEGA Cryogenic Targets," to be published in *Physics of Plasmas*.

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*.

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*.

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

S. D. Jacobs, A. E. Marino, L. L. Gregg, G. Chen, and Y. Due, "Durable Phosphate Glasses with Lower Transition Temperatures," to be published in the *Journal of Non-Crystalline Solids*.

D. Katsis, D. U. Kim, H. P. Chen, L. J. Rothberg, S. H. Chen, and T. Tsutsui, "Circularly Polarized Photoluminescence from a Gradient-Pitch Chiral-Nematic Film," to be published in *Chemistry of Materials*.

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*.

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

M. D. Skeldon, "An Optical-Pulse-Shaping System Based on an Electrooptic Modulator Driven by an Aperture-Coupled-Stripline Electrical-Waveform Generator," to be published in the *Journal of the Optical Society of America B*.

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.

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.

E. A. Startsev and C. J. McKinstrie, "Relativistic Ponderomotive Dynamics of a Test Particle in a Plasma," to be published in Physical Review E.

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.

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

S. D. Jacobs and S. R. Arrasmith "Magnetorheological Finishing of Optics," ASME International Joint Tribology Conference, Seattle, WA, 1-4 October 2000.

R. L. McCrory, R. E. Bahr, R. Betti, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, J. Frenje, V. Yu. Glebov, V. N. Goncharov, O. V. Gotchev, R. Q. Gram, D. R. Harding, D. G. Hicks, P. A. Jaanimagi, R. L. Keck, J. Kelly, J. P. Knauer, C. K. Li, S. J. Loucks, L. D. Lund, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, R. D. Petrasso, P. B. Radha, S. P. Regan, S. Roberts, F. Séguin, W. Seka, S. Skupsky, V. A. Smalyuk, C. Sorce, J. M. Soures, C. Stoeckl, R. P. J. Town, M. D. Wittman, B. Yaakobi, and J. D. Zuegel, "OMEGA ICF Experiments and Preparation for Direct-Drive Ignition on NIF," 18th IAEA Fusion Energy Conference, Sorrento, Italy, 4-10 October 2000.

The following presentations were made at the 16th Interdisciplinary Laser Science Conference (ILS-XVI), Providence, RI, 22-26 October 2000:

M. J. Guardalben, L. Ning, N. Jain, and D. J. Battaglia, "Investigation of Error Sources in the Liquid Crystal Point Diffraction Interferometer (LCPDI)."

J. H. Kelly, A. Babushkin, R. Boni, W. R. Donaldson, P. A. Jaanimagi, R. L. Keck, R. L. McCrory, S. F. B. Morse, A. V. Okishev, R. G. Peck, R. G. Roides, W. Seka, M. D. Skeldon, and K. A. Thorp, "Safely Operating a Large-Scale Laser Facility for Fusion Research."

T. Z. Kosc, K. L. Marshall, and S. D. Jacobs, "Polymer Liquid Crystal Flakes for Switchable Optical Devices."

K. L. Marshall, M. J. Guardalben, S. M. Corsello, M. S. Moore, I. A. Lippa, and R. P. Brecker, "Device Applications of Highly Soluble Near-Infrared Transition Metal Dyes in Liquid Crystal Hosts."

The following presentations were made at the 42nd Annual Meeting of the APS Division of Plasma Physics, Quebec City, Canada, 23–27 October 2000:

R. Betti, M. Umansky, and V. Lobatchev, "Theory of the Deceleration-Phase Rayleigh–Taylor Instability."

T. R. Boehly, "Optical and Plasma Smoothing of Laser Imprinting in Targets Driven by Lasers with SSD Bandwidths up to 1 THz" (invited).

T. R. Boehly, B. Yaakobi, J. P. Knauer, D. D. Meyerhofer, R. P. J. Town, D. Hoarty, and O. Willi, "Measurements of Shock Heating Al Absorption Spectroscopy in Planar Targets."

T. J. B. Collins and S. Skupsky, "Imprint Reduction with Shaped Pulses."

R. S. Craxton, J. A. Marozas, and S. Skupsky, "Two-Dimensional Hydrodynamic Simulations of SSD Laser Imprint."

J. A. Delettrez, S. P. Regan, P. B. Radha, and R. P. J. Town, "A New Model for the Analysis of Burnthrough Experiments on OMEGA."

R. Epstein, J. A. Delettrez, P. B. Radha, T. R. Boehly, S. P. Regan, B. Yaakobi, and J. J. MacFarlane, "Two-Dimensional Simulations of X-Ray Absorption Spectra from Nonuniformly Driven Planar Targets."

J. A. Frenje, K. M. Green, D. G. Hicks, C. K. Li, F. H. Séguin, R. D. Petrasso, T. C. Sangster, T. W. Phillips, V. Yu. Glebov, D. D. Meyerhofer, S. Roberts, J. M. Soures, C. Stoeckl, K. Fletcher, and S. Padalino, "A Neutron Spectrometer for Precise Measurements of DT Neutrons from 10 to 18 MeV at OMEGA and the National Ignition Facility."

V. Yu. Glebov, D. D. Meyerhofer, and C. Stoeckl, "Measurement of Secondary Neutron Yield by Copper Activation."

O. V. Gotchev, P. A. Jaanimagi, J. P. Knauer, F. J. Marshall, and D. D. Meyerhofer, "A High-Throughput, High-Resolution,

Streaked Kirkpatrick-Baez Microscope for Planar Direct-Drive Experiments on OMEGA."

D. G. Hicks, C. K. Li, F. H. Séguin, A. K. Ram, J. A. Frenje, R. D. Petrasso, J. M. Soures, V. Yu. Glebov, D. D. Meyerhofer, S. Roberts, C. Sorce, C. Stoeckl, T. C. Sangster, and T. W. Phillips, "Charged-Particle Acceleration and Energy Loss Measurements on OMEGA."

A. V. Kanaev and C. J. McKinstrie, "Numerical Simulations of the SSD- and DPP-Smoothed Laser Beam Filamentation and Forward Stimulated Brillouin Scattering in Plasmas."

R. L. Keck, W. R. Donaldson, P. A. Jaanimagi, W. Seka, and R. Boni, "Beam Power Matching on the OMEGA Laser."

D. Keller, T. J. B. Collins, J. A. Delettrez, R. Epstein, P. W. McKenty, P. B. Radha, R. P. J. Town, G. A. Moses, P. P. H. Wilson, and J. J. MacFarlane, "Modeling Planar Burnthrough and Adiabatic Experiments Using DRACO."

J. P. Knauer, R. Betti, T. R. Boehly, T. J. B. Collins, D. D. Meyerhofer, R. P. J. Town, and V. A. Smalyuk, "Measured Reduction of RT Growth at the Ablation Interface by Modification of the Isentrope."

M. V. Kozlov and C. J. McKinstrie, "Nonlinear Sound Waves in Two-Ion Plasmas."

C. K. Li, D. G. Hicks, F. H. Séguin, J. A. Frenje, K. M. Green, R. D. Petrasso, J. M. Soures, D. D. Meyerhofer, V. Yu. Glebov, C. Stoeckl, S. Roberts, T. C. Sangster, and T. W. Phillips, "Measurements of Areal Densities and Temperatures from DT Capsule Implosions on OMEGA."

V. Lobatchev, M. Umansky, and R. Betti, "Growth Rates of the Deceleration-Phase Rayleigh–Taylor Instability."

J. A. Marozas and J. D. Zuegel, "The Smoothing Performance of Various Picket-Fence Schemes on NIF."

F. J. Marshall, J. A. Delettrez, D. D. Meyerhofer, T. A. Ohki, S. P. Regan, V. A. Smalyuk, B. Yaakobi, and J. A. Oertel, "Monochromatic Imaging of Direct-Drive Implosions on OMEGA."

P. W. McKenty, V. N. Goncharov, R. P. J. Town, S. Skupsky, R. Betti, and R. L. McCrory, "Analysis of a Direct-Drive Ignition Capsule Designed for the NIF."

C. J. McKinstrie and M. V. Kozlov, "SBS from Fast and Slow Waves in Two-Ion Plasmas."

D. D. Meyerhofer, J. A. Delettrez, R. Epstein, V. Yu Glebov, V. N. Goncharov, R. L. Keck, R. L. McCrory, P. W. McKenty, F. J. Marshall, P. B. Radha, S. P. Regan, S. Roberts, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, C. Sorce, R. P. J. Town, B. Yaakobi, J. D. Zuegel, R. D. Petrasso, S. Padalino, J. A. Frenje, D. G. Hicks, F. H. Séguin, C. K. Li, N. Izumi, R. Lerche, T. C. Sangster, and T. W. Phillips, "Core Performance and Mix in Direct-Drive Spherical Implosions with High Uniformity" (invited).

P. B. Radha, V. Yu. Glebov, F. J. Marshall, D. D. Meyerhofer, R. D. Petrasso, S. P. Regan, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, and B. Yaakobi, "A Measurement-Based Picture of Core Conditions in OMEGA Implosions."

S. P. Regan, J. A. Delettrez, B. Yaakobi, R. Epstein, D. D. Meyerhofer, W. Seka, P. B. Radha, and R. P. J. Town, "Laser-Driven Burnthrough Experiments on OMEGA with 1-THz SSD."

F. H. Séguin, J. A. Frenje, C. K. Li, D. G. Hicks, K. M. Green, R. D. Petrasso, V. Yu. Glebov, C. Stoeckl, P. B. Radha, J. M. Soures, D. D. Meyerhofer, S. Roberts, C. Sorce, T. C. Sangster, M. D. Cable, S. Padalino, and K. Fletcher, "Secondary-Proton Spectra from D₂-Filled OMEGA Targets."

W. Seka, D. D. Meyerhofer, R. S. Craxton, S. P. Regan, R. E. Bahr, R. W. Short, B. Yaakobi, J. Fuchs, D. Montgomery, and B. Afeyan, "Stimulated Brillouin Scattering in Very Long Velocity Scale-Length NIF Plasmas."

R. W. Short, "The Effects of Beam-Intensity Structure on Two-Plasmon Decay in Direct-Drive Laser Fusion Targets."

R. W. Short and A. Simon, "Propagation of Plasma Waves in Weakly Collisional Plasmas."

A. Simon, R. W. Short, R. Betti, and V. N. Goncharov, "The Effect of Weak Collisions on Plasma Oscillations."

V. A. Smalyuk, J. A. Delettrez, F. J. Marshall, D. D. Meyerhofer, S. P. Regan, R. P. J. Town, and B. Yaakobi, "Time-Resolved Measurements of Compressed Shell Temperature and Areal Density with Titanium-Doped Targets on OMEGA."

C. Stoeckl, J. A. Delettrez, V. Yu Glebov, P. W. McKenty, and D. D. Meyerhofer, "Comparison of Neutron Burn History Measurements with One- and Two-Dimensional Hydrodynamic Simulations."

R. P. J. Town, J. A. Delettrez, V. N. Goncharov, D. R. Harding, P. W. McKenty, and R. L. McCrory, "The Effect of Elevated Internal Gas Pressure on Direct-Drive Cryogenic Target Performance."

M. Umansky, J. P. Freidberg, and R. Betti, "Stability of the Resistive Wall Mode in the Presence of Moving Walls."

The following presentations were made at the Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 16–18 October 2000:

S. Papernov, A. W. Schmid, R. Krishnan, and L. Tsybeskov, "Using Colloidal Gold Nanoparticles for Studies of Laser Interaction with Defects in Thin Films."

A. L. Rigatti, D. J. Smith, G. L. Mitchell, J. Dirmyer, A. W. Schmid, and S. Papernov, "Moisture Barrier Coatings to Prevent Environmental Degradation of KDP Crystals."

D. J. Smith, J. B. Oliver, J. Howe, C. Stolz, and A. Rigatti, "The Use of Hafnia/Silica Multilayer Coatings on Large Mirrors and Polarizers for the National Ignition Facility."

J. Taniguchi, N. LeBarron, J. Howe, D. Smith, C. Stolz, C. Weinzapfel, and J. Kimmons, "Functional Damage Thresholds of Hafnia/Silica Coating Designs for the NIF Laser."

A. V. Okishev, "High-Energy Solid-State Lasers for ICF Applications" International Congress on "Optics-XXI Century," St. Petersburg, Russia, 16–18 October 2000.

S. P. Regan, J. A. Delettrez, B. Yaakobi, V. A. Smalyuk, F. J. Marshall, D. D. Meyerhofer, W. Seka, D. A. Haynes, Jr., and C. F. Hooper, Jr., "Characterization of Direct-Drive-Implosion Core Conditions on OMEGA with Time-Resolved Ar *K*-Shell Spectroscopy Radiative Properties of Hot Dense Matter," Santa Barbara, CA, 30 October–3 November 2000.

