
Publications and Conference Presentations

Publications

S. R. Arrasmith, I. A. Kozhinova, L. L. Gregg, H. J. Romanofsky, A. B. Shorey, S. D. Jacobs, D. Golini, W. I. Kordonski, P. Dumas, and S. Hogan, "Details of the Polishing Spot in Magnetorheological Finishing (MRF)," in *Optical Manufacturing and Testing III*, edited by H. Stahl (SPIE, Bellingham, WA, 1999), Vol. 3782, pp. 92–100.

J. L. Chaloupka and D. D. Meyerhofer, "Observation of Electron Trapping in an Intense Laser Beam," *Phys. Rev. Lett.* **83**, 4538 (1999).

S.-H. Chen, J. C. Mastrangelo, and R. J. Jin, "Glassy Liquid-Crystal Films as Broadband Polarizers and Reflectors via Spatially Modulated Photorecimization," *Adv. Mater.* **11**, 1183 (1999).

F. Dahmani, J. C. Lambropoulos, A. W. Schmid, S. Papernov, and S. J. Burns, "Crack Arrest and Stress Dependence of Laser-Induced Surface Damage in Fused-Silica and Borosilicate Glass," *Appl. Opt.* **38**, 6892 (1999).

S. D. Jacobs, S. A. Arrasmith, I. A. Kozhinova, L. L. Gregg, A. B. Shorey, H. J. Romanofsky, D. Golini, W. I. Kordonski, P. Dumas, and S. Hogan, "Magnetorheological Finishing (MRF): Computer-Controlled Optics Manufacturing," *The American Ceramic Society Bulletin*, December 1999, pp. 42–48.

D. Katsis, P. H. M. Chen, J. C. Mastrangelo, S.-H. Chen, and T. N. Blanton, "Vitrified Chiral-Nematic Liquid Crystalline Films for Selective Reflection and Circular Polarization," *Chem. Mater.* **11**, 1590 (1999).

R. S. Knox, "Physical Aspects of the Greenhouse Effect and Global Warming," *Am. J. Phys.* **67**, 1227 (1999).

C. J. McKinstrie and E. A. Startsev, "Forward and Backward Stimulated Brillouin Scattering of Crossed Laser Beams," *Phys. Rev. E* **60**, 5978 (1999).

A. B. Shorey, L. L. Gregg, H. J. Romanofsky, S. R. Arrasmith, I. Kozhinova, J. Jubregsen, and S. D. Jacobs, "Study of Material Removal During Magnetorheological Finishing (MRF)," in *Optical Manufacturing and Testing III*, edited by H. Stahl (SPIE, Bellingham, WA, 1999), Vol. 3782, pp. 101–111.

A. B. Shorey, W. I. Kordonski, S. R. Gorodkin, S. D. Jacobs, R. F. Gans, K. M. Kwong, and C. H. Farny, "Design and Testing of a New Magnetorheometer," *Rev. Sci. Instrum.* **70**, 4200 (1999).

Forthcoming Publications

R. Adam, M. Currie, C. Williams, R. Sobolewski, O. Harnack, and M. Darula, "Direct Observation of Subpicosecond Single-Flux-Quantum in Pulse-Driven Y-Ba-Cu-O Josephson Junctions," to be published in *Applied Physics Letters*.

S. R. Arrasmith, S. D. Jacobs, I. A. Kozhinova, A. B. Shorey, D. Golini, W. I. Kordonski, S. Hogan, and P. Dumas, "Devel-

opment 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.

R. Betti, "Radial Discontinuities in Tokamak MHD Equilibria with Poloidal Flow," to be published in *Physics of Plasmas*.

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, 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. P. 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*.

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. L. Chaloupka and D. D. Meyerhofer, "Characterization of a Tunable Single-Beam Ponderomotive-Optical Trap," to be published in the *Journal of the Optical Society of America B*.

S.-H. Chen, R. J. Jin, D. Katsis, J. C. Mastrangelo, S. Papernov, and A. W. Schmid, "Selective Reflection and Polarization Band of Glassy Chiral-Nematic Films Broadened by Photoracemization," to be published in *Liquid Crystals*.

T. J. B. Collins, H. L. Helfer, and H. M. VanHorn, "Oscillations of Accretion Disks and Boundary Layers in Cataclysmic Variables: I. Unperturbed, Steady-Flow Models," to be published in *Astrophysical Journal*.

T. J. B. Collins, H. L. Helfer, and H. M. VanHorn, "Oscillations of Accretion Disks and Boundary Layers in Cataclysmic Variables: II. A Local, Linear Stability Analysis of Accretion Disk Boundary Layers," to be published in *Astrophysical Journal*.

M. Currie, C.-C. Wang, R. Sobolewski, and T. Y. Hsiang, "Picosecond Nodal Testing of Centimeter-Size Superconducting Nb Microstrip Interconnects," to be published in *Applied Superconductivity*.

F. Dahmani, A. W. Schmid, J. C. Lambropoulos, and S. J. Burns, "Lifetime Prediction of Laser-Pre-cracked Fused Silica Subjected to Subsequent Cyclic Laser Pulses," to be published in the *Journal of Materials Science*.

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," to be published in *Liquid Crystals*.

R. E. Giacone, C. J. McKinstrie, and T. Kolber, "Angular Dependence of Stimulated Brillouin Scattering in a Homogeneous Two-Dimensional Plasma," to be published in *Physics of Plasmas*.

V. N. Goncharov, S. Skupsky, P. W. McKenty, J. A. Delettrez, R. P. J. Town, and C. Cherfils-Clérouin, "Stability Analysis of Directly Driven OMEGA and NIF Capsules," to be published in the *Proceedings of the 1999 Inertial Fusion Sciences and Applications Conference*, Bordeaux, France, 12–17 September 1999.

V. N. Goncharov, S. Skupsky, P. W. McKenty, R. P. J. Town, T. R. Boehly, D. D. Meyerhofer, and O. V. Gotchev, "A Model of Laser Imprinting," to be published in *Physics of Plasmas* (invited).

V. N. Goncharov, J. A. Delettrez, S. Skupsky, and R. P. J. Town, "Modeling Laser Imprint for Inertial Confinement Fusion Targets," to be published in *Physical Review Letters*.

K. Green and R. Sobolewski, "Extending the S-Parameter Approach to Linear Time-Varying Microwave Devices: Part I. Analysis," to be published in *IEEE Microwave Theory and Techniques*.

K. S. Il'in, M. Lindgren, M. Currie, A. D. Semenov, G. N. Gol'tsman, R. Sobolewski, S. I. Cherednichenko, and E. M. Gershenson, "Picosecond Hot-Electron Energy Relaxation in NbN Superconducting Photodetectors," to be published in *Applied Physics Letters*.

J. P. Knauer, R. Betti, D. K. Bradley, T. R. Boehly, T. J. B. Collins, V. N. Goncharov, P. W. McKenty, D. D. Meyerhofer, V. A. Smalyuk, C. P. Verdon, S. G. Glendinning, D. H. Kalantar, and R. G. Watt, "Single-Mode Rayleigh–Taylor Growth-Rate Measurements on the OMEGA Laser System," to be published in *Physics of Plasmas*.

C. K. Li, D. G. Hicks, F. H. Séguin, R. D. Petrasso, J. M. Soures, P. B. Radha, V. Yu. Glebov, C. Stoeckl, J. P. Knauer, R. Kremens, F. J. Marshall, D. D. Meyerhofer, S. Skupsky, S. Roberts, C. Sorce, T. C. Sangster, T. W. Phillips, and M. D. Cable, “D-³He Proton Spectra for Diagnosing Shell ρR and Fuel T_i of Imploded Capsules at OMEGA,” to be published in the *Journal of Plasma Physics*.

F. J. Marshall, J. A. Delettrez, R. Epstein, V. Yu. Glebov, D. R. Harding, P. W. McKenty, D. D. Meyerhofer, R. D. Petrasso, P. B. Radha, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, B. Yaakobi, D. G. Hicks, C. K. Li, and F. H. Séguin, “Direct-Drive, High-Convergence-Ratio Implosion Studies on the OMEGA Laser System,” to be published in *Physics of Plasmas*.

F. J. Marshall, “Direct-Drive, Hollow-Shell Implosion Studies on the 60-Beam, UV OMEGA Laser System,” to be published in *Physics of Plasmas*.

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 Direct-Drive Ignition on the National Ignition Facility,” to be published in the *Proceedings of the 1999 Inertial Fusion Sciences and Applications Conference*, Bordeaux, France, 12–17 September 1999.

P. W. McKenty, M. D. Wittman, and V. N. Goncharov, “Characterization of Thick Cryogenic Fuel Layers Using Convergent-Beam Interferometry: a Numerical Investigation,” to be published in the *Journal of Applied Physics*.

P. B. Radha, S. Skupsky, R. D. Petrasso, and J. M. Soures, “A Novel Charged-Particle Diagnostic for Compression in ICF Targets,” to be published in *Physics of Plasmas*.

D. J. Smith, J. A. Warner, N. E. LeBarron, T. J. Kessler, S. LaDelia, J. P. Knauer, D. D. Meyerhofer, D. Oron, and D. Shvarts, “The Development of Ion-Etched Phase Plates,” to be published in *Applied Optics*.

R. Sobolewski, “Time-Resolved Nonequilibrium Phenomena in High-Temperature Superconductors,” to be published in the *Proceedings of the International Workshop on Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Quantum Systems, Recountres du Vietnam, June 1999* (invited).

J. M. Soures, R. L. McCrory, R. Betti, W. Bittle, T. R. Boehly, R. Boni, D. K. Bradley, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, V. Glebov, V. N. Goncharov, D. R. Harding, P. A. Jaanimagi, R. L. Keck, J. H. Kelly, T. J. Kessler, J. P. Knauer, C. K. Li, S. J. Loucks, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, S. Padalino, R. Petrasso, P. B. Radha, S. P. Regan, W. Seka, R. W. Short, A. Simon, S. Skupsky, D. J. Smith, R. P. J. Town, B. Yaakobi, and J. D. Zuegel, “Recent Advances in Direct-Drive ICF Target Physics at the Laboratory for Laser Energetics,” to be published in the *Proceedings of the 1998 IAEA Conference*, Yokohama, Japan, 19–24 October 1998.

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

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, V. A. Smalyuk, J. A. Delettrez, R. P. J. Town, F. J. Marshall, V. Yu. Glebov, R. D. Petrasso, J. M. Soures, D. D. Meyerhofer, and W. Seka, “Spherical Implosion Experiments on OMEGA: Measurements of the Cold, Compressed Shell,” to be published in the *Proceedings of the 1999 Inertial Fusion Sciences and Applications Conference*, Bordeaux, France, 12–17 September, 1999.

Conference Presentations

J. L. Chaloupka and D. D. Meyerhofer, "Observation of Electron Trapping in an Intense Laser Beam," International Conference on Multiphoton Processes, Monterey, CA, 3–8 October 1999.

A. V. Okishev, M. D. Skeldon, J. H. Kelly, A. Babushkin, J. D. Zuegel, R. G. Roides, S. F. B. Morse, and W. Seka, "Front-End Laser System for the OMEGA Laser Fusion Facility," Optics '99, St. Petersburg, Russia, 19–21 October 1999.

The following presentations were made at the 13th Annual Target Fabrication Meeting, Catalina Island, CA, 8–11 November 1999:

E. L. Alfonso, I. Anteby, and D. R. Harding, "Temperature and Ice-Thickness Profiles Within Cryogenic ICF Targets."

M. Bonino, L. Elasky, R. Q. Gram, S. Noyes, and D. R. Harding, "Stress–Strain Performance of Spider Silk."

R. Q. Gram, J. Hobler, L. Lund, and D. R. Harding, "Initial Performance of the High-Pressure DT Filling Portion of the Cryogenic Target-Handling System."

P. W. McKenty and M. D. Wittman, "Characterization of Thick Cryogenic Layers Using an Interferometric Imaging System and Legendre Mode Decomposition."

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."

The following presentations were made at the 41st Annual Meeting of the American Physical Society Division of Plasma Physics, Seattle, WA, 15–19 November 1999:

T. R. Boehly, O. Gotchev, V. N. Goncharov, J. P. Knauer, D. D. Meyerhofer, S. Skupsky, V. A. Smalyuk, R. P. J. Town, Y. Srebro, and D. Shvarts, "Measurements of Laser Imprinting on the OMEGA Laser System."

T. J. B. Collins and S. Skupsky, "The Effects of Pulse Shaping on Imprint."

R. S. Craxton and S. Skupsky, "Pulse Shapes and Beam Smoothing for OMEGA and the NIF."

J. A. Delettrez, V. Yu. Glebov, F. J. Marshall, C. Stoeckl, B. Yaakobi, and D. D. Meyerhofer, "Effect of Beam Smoothing and Pulse Shape on the Implosion of DD-Filled CH Shell Targets on OMEGA."

R. Epstein, J. A. Delettrez, V. N. Goncharov, P. W. McKenty, P. B. Radha, and S. Skupsky, "One-Dimensional Simulation of the Effects of Unstable Mix on Neutron and Charged-Particle Spectra from Laser-Driven Implosion Experiments."

V. Yu. Glebov, J. A. Delettrez, R. Epstein, P. W. McKenty, F. J. Marshall, D. D. Meyerhofer, P. B. Radha, V. A. Smalyuk, and C. Stoeckl, "Evidence for Fuel-Pusher Mixing in OMEGA Direct-Drive Implosions by Neutron Diagnostic."

V. N. Goncharov, S. Skupsky, P. W. McKenty, R. P. J. Town, T. R. Boehly, D. D. Meyerhofer, and O. V. Gotchev, "A Model of Laser Imprinting" (invited).

O. V. Gotchev, J. P. Knauer, D. D. Meyerhofer, and V. A. Smalyuk, "Characterization of an X-Ray Radiographic System for Measuring the Evolution of Broadband Imprint in Laser-Driven Planar Targets."

D. R. Harding, L. D. Lund, S. J. Loucks, D. J. Lonobile, R. Q. Gram, M. D. Wittman, M. J. Shoup III, G. Gerspacher, U. Kamal, L. Folsbee, A. Nobile, G. Besenbruch, K. Schultz, and I. Anteby, "The OMEGA Cryogenic Target-Handling System."

D. G. Hicks, C. K. Li, F. H. Séguin, R. D. Petrasso, J. M. Soures, C. Stoeckl, J. P. Knauer, D. D. Meyerhofer, W. Seka, R. W. Short, A. Simon, T. W. Phillips, T. C. Sangster, and M. D. Cable, "Measurement of Accelerated Ions from OMEGA Targets."

P. A. Jaanimagi, R. Boni, and R. L. Keck, "Neutron-Induced Background in CCD Detectors."

- A. V. Kanaev and C. J. McKinstrie, "Numerical Two-Dimensional Studies of Near-Forward Stimulated Brillouin Scattering of a Laser Beam in Plasmas."
- D. Keller, T. J. B. Collins, J. A. Delettrez, P. W. McKenty, P. B. Radha, R. P. J. Town, B. Whitney, and G. A. Moses, "DRACO—A New Multidimensional Hydrocode."
- J. P. Knauer, R. Betti, T. R. Boehly, V. N. Goncharov, D. D. Meyerhofer, and R. P. J. Town, "Feed-Out of Rear-Surface Perturbations to the Ablation Interface and Subsequent Growth."
- M. V. Kozlov and C. J. McKinstrie, "Numerical Simulation of Sound-Wave Generation in Two-Ion Plasma."
- C. K. Li, R. D. Petrasso, D. G. Hicks, F. H. Séguin, J. M. Soures, P. B. Radha, V. Yu. Glebov, J. P. Knauer, F. J. Marshall, S. Roberts, S. Skupsky, C. Sorce, C. Stoeckl, T. C. Sangster, T. W. Phillips, and M. D. Cable, "T-³He Deuterons as a Diagnostic for Capsule Implosions on OMEGA."
- V. Lobatchev and R. Betti, "Numerical Study of Feed-Out of Short-Wavelength Rear-Surface Perturbations in Planar Targets."
- F. J. Marshall, J. A. Delettrez, R. Epstein, V. Yu. Glebov, D. R. Harding, P. W. McKenty, D. D. Meyerhofer, R. D. Petrasso, P. B. Radha, W. Seka, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, B. Yaakobi, D. G. Hicks, C. K. Li, and F. H. Séguin, "Direct-Drive, High-Convergence-Ratio Implosion Studies on the OMEGA Laser System."
- D. D. Meyerhofer, P. W. McKenty, V. N. Goncharov, J. A. Delettrez, V. Yu. Glebov, F. J. Marshall, P. B. Radha, S. P. Regan, V. A. Smalyuk, J. M. Soures, C. Stoeckl, R. P. J. Town, B. Yaakobi, and R. D. Petrasso, "Performance of Spherical Target Implosions on the OMEGA Laser System."
- P. B. Radha, S. Cremer, J. A. Delettrez, R. Epstein, R. D. Petrasso, S. Skupsky, and J. M. Soures, "Charged-Particle Spectra Using Particle Tracking on a Two-Dimensional Grid."
- S. P. Regan, J. A. Delettrez, D. K. Bradley, V. Yu. Glebov, D. D. Meyerhofer, and C. Stoeckl, "Burnthrough Experiments on OMEGA to Study Effects of Laser Irradiation Uniformity and Shinethrough Layers on Spherical Target Performance."
- F. H. Séguin, R. D. Petrasso, C. K. Li, D. G. Hicks, J. M. Soures, P. B. Radha, V. Yu. Glebov, F. J. Marshall, D. D. Meyerhofer, C. Stoeckl, S. Roberts, C. Sorce, T. C. Sangster, T. W. Phillips, M. D. Cable, S. Padalino, and K. Fletcher, "Diagnostic Use of Secondary D-³He Proton Spectra for DD OMEGA Targets."
- W. Seka, D. D. Meyerhofer, S. P. Regan, B. Yaakobi, R. E. Bahr, R. S. Craxton, R. W. Short, and A. Simon, "Interaction Experiments Under Direct-Drive NIF Conditions."
- R. W. Short, "Stability of Self-Focused Filaments in Laser-Produced Plasmas."
- A. Simon, "Relativistic Electron Beams, Forward Thomson Scattering, and Raman Scattering."
- V. A. Smalyuk, B. Yaakobi, V. N. Goncharov, J. A. Delettrez, F. J. Marshall, and D. D. Meyerhofer, "Imaging of Compressed Pure-CH Shells and CH Shells with Titanium-Doped Layers on OMEGA."
- E. A. Startsev and C. J. McKinstrie, "Particle-in-Cell Simulations of Particle Acceleration."
- C. Stoeckl, J. A. Delettrez, V. Yu. Glebov, D. D. Meyerhofer, W. Seka, V. A. Smalyuk, S. Sublett, and J. D. Zuegel, "Measurements of Hard X-Ray Emission from Laser-Plasma Instabilities on OMEGA."
- R. P. J. Town, J. A. Delettrez, R. Epstein, V. N. Goncharov, P. W. McKenty, P. B. Radha, and S. Skupsky, "OMEGA Cryogenic Target Design."

