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## Publications and Conference Presentations

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### Publications

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T. R. Boehly, T. J. B. Collins, O. Gotchev, T. J. Kessler, J. P. Knauer, T. C. Sangster, and D. D. Meyerhofer, "Observations of Modulated Shock Waves in Solid Targets Driven by Spatially Modulated Laser Beams," *J. Appl. Phys.* **92**, 1212 (2002).

H. Brunnader, W. T. Shmayda, D. R. Harding, L. D. Lund, and R. Janezic, "Advanced Tritium Recovery System," *Fusion Sci. Technol.* **41**, 840 (2002)

Y. Cao, H. Li, J. A. Szpunar, and W. T. Shmayda, "Effects of Textures on Hydrogen Diffusion in Nickel," in *Textures of Materials*, Materials Science Forum, Vols. 408–412, edited by D. N. Lee (Trans Tech Publications, Aedermannsdorf, Switzerland, 2002), Part 2, pp. 1139–1144.

I. V. Igumenshchev, "On Angular Momentum Transport in Convection-Dominated Accretion Flows," *Astrophys. J.* **577**, L31 (2002).

S. D. Jacobs and L. L. Gregg, "Making Waves with the Optics Suitcase," *Opt. Photonics News* **13**, 12 (2002).

T. Z. Kosc, K. L. Marshall, S. D. Jacobs, J. C. Lambropoulos, and S. M. Faris, "Electric-Field-Induced Motion of Polymer Cholesteric Liquid-Crystal Flakes in a Moderately Conductive Fluid," *Appl. Opt.* **41**, 5362 (2002).

M. V. Kozlov and C. J. McKinstrie, "Sound Waves in Two-Ion Plasmas," *Phys. Plasmas* **9**, 3783 (2002).

P. Kús, A. Plecenik, L. Satrapinsky, Y. Xu, and R. Sobolewski, "Superconducting Properties of MgB<sub>2</sub> Thin Films Prepared on Flexible Substrates," *Appl. Phys. Lett.* **81**, 2199 (2002).

S. Papernov and A. W. Schmid, "Establishing Links Between Single Gold Nanoparticles Buried Inside SiO<sub>2</sub> Thin Film and 351-nm Pulsed Laser Damage Morphology," in *Laser-Induced*

*Damage in Optical Materials: 2001*, edited by G. J. Exarhos, A. H. Guenther, K. L. Lewis, M. J. Soileau, and C. J. Stolz (SPIE, Bellingham, WA, 2002), Vol. 4679, pp. 282–292.

S. P. Regan, J. A. Delettrez, F. J. Marshall, J. M. Soures, V. A. Smalyuk, B. Yaakobi, R. Epstein, V. Yu. Glebov, P. A. Jaanimagi, D. D. Meyerhofer, P. B. Radha, T. C. Sangster, W. Seka, S. Skupsky, C. Stoeckl, R. P. J. Town, D. A. Haynes, Jr., I. E. Golovkin, C. F. Hooper, Jr., J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Shell Mix in Compressed Core of Spherical Implosions," *Phys. Rev. Lett.* **89**, 085003 (2002).

S. P. Regan, J. A. Delettrez, B. Yaakobi, V. A. Smalyuk, F. J. Marshall, R. Epstein, V. Yu. Glebov, P. A. Jaanimagi, D. D. Meyerhofer, P. B. Radha, W. Seka, S. Skupsky, J. M. Soures, C. Stoeckl, R. P. J. Town, D. A. Haynes, Jr., I. Golovkin, C. F. Hooper, Jr., J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "High-Density, Direct-Drive Implosions on OMEGA," in *Inertial Fusion Sciences and Applications 2001*, edited by K. A. Tanaka, D. D. Meyerhofer, and J. Meyer-ter-Vehn (Elsevier, Paris, 2002), pp. 89–95.

F. H. Séguin, C. K. Li, J. A. Frenje, S. Kurebayashi, R. D. Petrasso, F. J. Marshall, D. D. Meyerhofer, J. M. Soures, T. C. Sangster, C. Stoeckl, J. A. Delettrez, P. B. Radha, V. A. Smalyuk, and S. Roberts, "Measurements of  $\rho R$  Asymmetries at Burn Time in Inertial-Confinement-Fusion Capsules," *Phys. Plasmas* **9**, 3558 (2002).

C. R. Shmayda, W. T. Shmayda, and N. P. Kherani, "Monitoring Tritium Activity on Surfaces: Recent Developments," *Fusion Sci. Technol.* **41**, 500 (2002).

W. T. Shmayda, A. Bruggeman, J. Braet, and S. Vanderbiesen, "Treatment of Tritiated Solvents," *Fusion Sci. Technol.* **41**, 721 (2002).

W. T. Shmayda and R. D. Gallagher, "Recovery of Tritium from Pharmaceutical Mixed Waste Liquids," *Fusion Sci. Technol.* **41**, 726 (2002).

R. W. Short and A. Simon, "Damping of Perturbations in Weakly Collisional Plasmas," *Phys. Plasmas* **9**, 3245 (2002).

S. Skupsky, R. Betti, T. J. B. Collins, V. N. Goncharov, D. R. Harding, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, and R. P. J. Town, "High-Gain Direct-Drive Target Designs for the National Ignition Facility," in *Inertial Fusion Sciences and Applications 2001*, edited by K. A. Tanaka, D. D. Meyerhofer, and J. Meyer-ter-Vehn (Elsevier, Paris, 2002), pp. 243–245.

R. P. J. Town, J. A. Delettrez, R. Epstein, V. N. Goncharov, C. K. Li, R. L. McCrory, P. W. McKenty, P. B. Radha, S. Skupsky, V. Yu. Glebov, D. R. Harding, D. D. Meyerhofer, F. J. Marshall, R. D. Petrasso, S. P. Regan, F. H. Séguin, W. Seka, V. A. Smalyuk, C. Stoeckl, J. M. Soures, and J. D. Zuegel, "OMEGA Direct-Drive Cryogenic Target Physics," in *Inertial Fusion Sciences and Applications 2001*, edited by K. A. Tanaka, D. D. Meyerhofer and J. Meyer-ter-Vehn (Elsevier, Paris, 2002), pp. 126–131.

L. J. Waxer, J. H. Kelly, J. Rothenberg, A. Babushkin, C. Bibeau, A. Bayramian, and S. Payne, "Precision Spectral Sculpting for Narrow-Band Amplification of Broadband Frequency-Modulated Pulses," *Opt. Lett.* **27**, 1427 (2002).

### Forthcoming Publications

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*.

Y. Geng, S. W. Culligan, A. Trajkovska, J. U. Wallace, and S. H. Chen, "Monodisperse Oligofluorenes Forming Glassy Nematic Films for Polarized Blue Emission," to be published in *Chemistry of Materials*.

R. K. Kirkwood, J. D. Moody, A. B. Langdon, B. I. Cohen, E. A. Williams, M. R. Dorr, J. A. Hittinger, R. Berger, P. E. Young, L. J. Suter, L. Divol, S. H. Glenzer, O. L. Landen, and W. Seka, "Observation of Saturation of Energy Transfer Between Copropagating Beams in a Flowing Plasma," to be published in *Physical Review Letters*.

J. A. Marozas and J. D. Zuegel, "The Smoothing Performance of Ultrafast Pickets on the NIF," to be published in the *Journal of the Optical Society of America B*.

R. L. McCrory, D. D. Meyerhofer, 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. H. Kelly, J. P. Knauer, S. J. Loucks, L. Lund, J. A. Marozas, P. W. McKenty, F. J. Marshall, S. F. B. Morse, P. B. Radha, S. P. Regan, S. Roberts, W. Seka, S. Skupsky, V. A. Smalyuk, C. Sorce, C. Stoeckl, C. Soures, R. P. J. Town, B. Yaakobi, J. A. Frenje, C. K. Li, R. D. Petrasso, F. H. Séguin, K. Fletcher,

S. Padalino, C. Freeman, and C. Sangster, "Direct-Drive Inertial Confinement Fusion Research at the Laboratory for Laser Energetics," to be published in the proceedings of *Current Trends in International Fusion Research: A Review*.

S. Papernov and A. W. Schmid, "Correlations Between Embedded Single Gold Nanoparticles in SiO<sub>2</sub> Thin Film and Nanoscale Crater Formation Induced by Pulsed-Laser Radiation," to be published in the *Journal of Applied Physics*.

G. Sabouret, C. Williams, and R. Sobolewski, "Resistive Switching Dynamics in Current-Biased YBa<sub>2</sub>Cu<sub>3</sub>O<sub>7-x</sub> Microbridges Excited by Nanosecond Electrical Pulses," to be published in *Physical Review B*.

W. Seka, H. A. Baldis, J. Fuchs, S. P. Regan, D. D. Meyerhofer, C. Stoeckl, B. Yaakobi, R. S. Craxton, and R. W. Short, "Multi-beam Stimulated Brillouin Scattering from Hot Solid-Target Plasmas," to be published in *Physical Review Letters*.

W. T. Shmayda, S. Zukotynski, D. Yeghikyan, and F. Gaspari, "Properties of Amorphous Carbon Films," to be published in *Fusion Science and Technology*.

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

V. A. Smalyuk, S. B. Dumanis, F. J. Marshall, J. A. Delettrez, D. D. Meyerhofer, T. C. Sangster, and B. Yaakobi, "Radial Structure of Shell Modulations Near Peak Compression of Spherical Implosions," to be published in *Physics of Plasmas*.

V. A. Smalyuk, P. B. Radha, J. A. Delettrez, V. Yu. Glebov, V. N. Goncharov, D. D. Meyerhofer, S. P. Regan, S. Roberts, T. C. Sangster, J. M. Soures, C. Stoeckl, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Time-Resolved Areal-Density Measurements with Proton Spectroscopy in Spherical Implosions," to be published in *Physical Review Letters*.

C. Stoeckl, V. Yu. Glebov, J. D. Zuegel, and D. D. Meyerhofer, "Wide-Dynamic-Range 'Neutron Bang Time' Detector on OMEGA," to be published in *Review of Scientific Instruments*.

A. Sunahara, J. A. Delettrez, C. Stoeckl, R. W. Short, and S. Skupsky, "Time-Dependent Electron-Thermal-Flux Inhibition in Direct-Drive Laser Implosion," to be published in *Physical Review Letters*.

B. Yaakobi, F. J. Marshall, T. R. Boehly, R. P. J. Town, and D. D. Meyerhofer, "Extended X-Ray Absorption Fine Structure Experiments Using a Laser-Imploded Target as a Radiation Source," to be published in the *Journal of the Optical Society of America B*.

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

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### Conference Presentations

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T. Z. Kosc, K. L. Marshall, S. D. Jacobs, and J. C. Lambropoulos, "Electric Field-Induced Rotation of Polymer Cholesteric Liquid Crystal Flakes: Mechanisms and Applications," International Symposium on Optical Science and Technology, Seattle, WA, 7–11 July 2002.

The following presentations were made at the 14th Topical Conference on High-Temperature Plasma Diagnostics, Madison, WI, 8–11 July 2002:

V. Yu. Glebov, C. Stoeckl, T. C. Sangster, D. D. Meyerhofer, P. B. Radha, S. Padalino, L. Baumgart, R. Coburn, and J. Fuschino, "Carbon Activation Diagnostic for Tertiary Neutron Measurements."

O. V. Gotchev, P. A. Jaanimagi, J. P. Knauer, F. J. Marshall, D. D. Meyerhofer, N. Bassett, and J. B. Oliver, "High-Throughput, High-Resolution, Kirkpatrick-Baez Microscope for Advanced Streaked Imaging of ICF Experiments on OMEGA."

D. L. McCrorey, R. C. Mancini, V. A. Smalyuk, S. P. Regan, and B. Yaakobi, "Spectroscopic Determination of Compressed-Shell Conditions in OMEGA Implosions Based on Ti *K*-Shell Line Absorption Analysis."

C. Stoeckl, V. Yu. Glebov, S. Roberts, T. C. Sangster, R. A. Lerche, and C. Sorce, "A TIM-Based Neutron Diagnostic for Cryogenic Experiments on OMEGA."

The following presentations were made at the 32nd Anomalous Absorption Conference, Oahu, HI, 21–26 July 2002:

J. A. Delettrez, J. P. Knauer, P. A. Jaanimagi, W. Seka, and C. Stoeckl, "Numerical Investigation of Recent Laser Absorption and Drive Experiments of CH Spherical Shells on the OMEGA Laser."

V. N. Goncharov, J. P. Knauer, P. W. McKenty, S. Skupsky, T. C. Sangster, R. Betti, and D. D. Meyerhofer, "Adiabatic Shaping of Direct-Drive Inertial Confinement Fusion (ICF) Implosions Using a High-Intensity Picket."

C. K. Li, F. H. Séguin, J. A. Frenje, S. Kurebayashi, R. D. Petrasso, D. D. Meyerhofer, J. M. Soures, J. A. Delettrez, V. Yu. Glebov, F. J. Marshall, P. B. Radha, S. P. Regan, S. Roberts, T. C. Sangster, and C. Stoeckl, "Effects of Fuel-Shell Mix on Direct-Drive, Spherical Implosions on OMEGA."

A. Maximov, J. Myatt, and R. W. Short, "Nonlinear Propagation of Laser Beams in Plasmas Near a Critical-Density Surface."

J. Myatt, A. Maximov, and R. W. Short, "Modeling Laser-Plasma Interaction Physics Under Direct-Drive Inertial Confinement Fusion Conditions."

R. D. Petrasso, R. Rygg, J. A. Frenje, C. K. Li, F. H. Séguin, S. Kurebayashi, B. Schwartz, P. B. Radha, J. M. Soures, J. A. Delettrez, V. Yu. Glebov, D. D. Meyerhofer, S. Roberts, T. C. Sangster, C. Stoeckl, and S. Hatchett, "Capsule Areal-Density Nonuniformities and Evolution Inferred from 14.7-MeV Proton Line Structure in OMEGA D<sup>3</sup>He Implosions."

S. P. Regan, R. S. Craxton, J. A. Delettrez, D. D. Meyerhofer, T. C. Sangster, W. Seka, and B. Yaakobi, "Experimental Investigation of Expansion Velocity and Gradients in Long-Scale-Length Plasmas on OMEGA."

W. Seka, C. Stoeckl, B. Yaakobi, R. S. Craxton, R. W. Short, and H. Baldis, "Fast-Electron Preheat of Direct-Drive Targets Due to the Two-Plasmon-Decay Instability."

R. W. Short, "A Linear Model of Anomalous Stimulated Raman Scattering and Electron-Acoustic Waves in Laser-Produced Plasmas."

V. A. Smalyuk, J. A. Delettrez, R. Epstein, V. N. Goncharov, F. J. Marshall, D. D. Meyerhofer, S. P. Regan, T. C. Sangster, B. Yaakobi, D. L. McCrorey, and R. C. Mancini, "Measurements of Heat Propagation in Compressed Shells in Direct-Drive Spherical Implosions on OMEGA."

V. A. Smalyuk, P. B. Radha, J. A. Delettrez, V. Yu. Glebov, V. N. Goncharov, J. P. Knauer, D. D. Meyerhofer, S. P. Regan, S. Roberts, T. C. Sangster, S. Skupsky, J. M. Soures, C. Stoeckl, R. P. J. Town, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Areal-Density-Growth Measurements with Proton Spectroscopy in Spherical Implosions on OMEGA."

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S. G. Lukishova, A. W. Schmid, and R. W. Boyd, "Near-Field Optical Microscopy of Cholesteric Oligomer Liquid Crystal Layers," 7th International Conference on Near-Field Optics and Related Techniques, Rochester, NY, 11–15 August 2002.

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D. W. Griffin and K. L. Marshall, "Phase-Shifting Liquid Crystal Interferometers for Microgravity Fluid Physics," 6th Microgravity Fluid Physics and Transport Phenomena Conference, Cleveland OH, 14–16 August 2002.

S. Papernov and A. W. Schmid, "Damage Behavior of SiO<sub>2</sub> Thin Films Containing Gold Nanoparticles Lodged on a Pre-determined Distance from the Film Surface," XXXIV Annual Symposium on Optical Materials for High-Power Lasers, Boulder, CO, 16–19 September 2002.

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S. P. Regan, J. A. Delettrez, F. J. Marshall, J. M. Soures, V. A. Smalyuk, B. Yaakobi, R. Epstein, V. Yu. Glebov, P. A. Jaanimagi, D. D. Meyerhofer, P. B. Radha, T. C. Sangster, W. Seka, S. Skupsky, C. Stoeckl, D. A. Haynes, Jr., I. E. Golovkin, J. A. Frenje, C. K. Li, R. D. Petrasso, and F. H. Séguin, "Experimental Investigation of Shell Mix in the Compressed Core of Spherical Implosions Involving Hot, Dense Spectroscopy," 10th International Workshop on Radiative Properties of Hot Dense Matter, Saint-Malo, Brittany, France, 16–20 September 2002.

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S. D. Jacobs, H. M. Pollicove, E. M. Fees, and J. Schoen, "Aspheric Optics Manufacturing for Commercial and Military Systems," First Symposium for Explosive Materials, Weapons, and Military Technology, Ohrid, Republic of Macedonia, 25–28 September 2002.

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The following presentations were made at the 2002 OSA Annual Meeting, Orlando, FL, 29 September–3 October 2002:

M. J. Guardalben, J. Keegan, L. J. Waxer, and J. D. Zuegel, "Stability of Optical Parametric Amplification: Spatiotemporal Considerations in the Design of an OPCPA System."

S. G. Lukishova, R. W. Boyd, N. Lepeshkin, A. W. Schmid, and K. L. Marshall, "Feedback-Free Pattern Formation in Dye-Doped Liquid Crystals and Isotropic Liquids."

L. J. Waxer, V. Bagnoud, I. A. Begishev, M. J. Guardalben, J. Puth, and J. D. Zuegel, "Development of a High-Conversion-Efficiency OPCPA System for the OMEGA EP Laser System."