Publications and Conference Presentations

Publications

S.-W. Bahk, "Highly Accurate Wavefront Reconstruction Algorithms over Broad Spatial-Frequency Bandwidth," Opt. Express **19**, 18,997 (2011).

T. R. Boehly, V. N. Goncharov, W. Seka, S. X. Hu, J. A. Marozas, D. D. Meyerhofer, P. M. Celliers, D. G. Hicks, M. A. Barrios, D. Fratanduono, and G. W. Collins, "Multiple Spherically Converging Shock Waves in Liquid Deuterium," Phys. Plasmas **18**, 092706 (2011).

J. Bromage, J. Rothhardt, S. Hädrich, C. Dorrer, C. Jocher, S. Demmler, J. Limpert, A. Tünnermann, and J. D. Zuegel, "Analysis and Suppression of Parasitic Processes in Noncollinear Optical Parametric Amplifiers," Opt. Express **19**, 16,797 (2011).

P. Y. Chang, G. Fiksel, M. Hohenberger, J. P. Knauer, R. Betti, F. J. Marshall, D. D. Meyerhofer, F. H. Séguin, and R. D. Petrasso, "Fusion Yield Enhancement in Magnetized Laser-Driven Implosions," Phys. Rev. Lett. **107**, 035006 (2011).

C. G. Freeman, G. Fiksel, C. Stoeckl, N. Sinenian, M. J. Canfield, G. B. Graeper, A. T. Lombardo, C. R. Stillman, S. J. Padalino, C. Mileham, T. C. Sangster, and J. A. Frenje, "Calibration of a Thomson Parabola Ion Spectrometer and Fujifilm Imaging Plate Detectors for Protons, Deuterons, and Alpha Particles," Rev. Sci. Instrum. **82**, 073301 (2011).

E. Głowacki, K. L. Marshall, C. W. Tang, and N. S. Sariciftci, "Doping of Organic Semiconductors Induced by Lithium Fluoride/Aluminum Electrodes Studied by Electron Spin Resonance and Infrared Reflection-Absorption Spectroscopy," Appl. Phys. Lett. **99**, 043305 (2011).

S. D. Jacobs, "MRF with Adjustable pH," in *Optical Fabrication, Testing, and Metrology IV*, edited by A. Duparré (SPIE, Bellingham, WA, 2011), Vol. 8169, Paper 816902.

K. L. Marshall, S. K.-H. Wei, M. Vargas, K. Wegman, C. Dorrer, P. Leung, J. Boule III, Z. Zhao, and S. H. Chen, "Liquid Crystal Beam–Shaping Devices Employing Patterned Photoalignment Layers for High-Peak-Power Laser Applications," in *Liquid Crystals XV*, edited by I. C. Khoo (SPIE, Bellingham, WA, 2011), Vol. 8114, Paper 81140P.

C. Miao, R. Shen, M. Wang, S. N. Shafrir, H. Yang, and S. D. Jacobs, "Rheology of Aqueous Magnetorheological Fluid Using Dual Oxide-Coated Carbonyl Iron Particles," J. Am. Ceram. Soc. **94**, 2386 (2011).

M. Mikulics, P. Kordoš, D. Gregušová, R. Adam, M. Kočan, S. Wu, J. Zhang, R. Sobolewski, D. Grützmacher, and M. Marso, "Monolithic Integration of Ultrafast Photodetector and MESFET in the GaN Material System," IEEE Photonics Technol. Lett. **23**, 1189 (2011).

R. Nora and R. Betti, "One-Dimensional Planar Hydrodynamic Theory of Shock Ignition," Phys. Plasmas **18**, 082710 (2011).

B. B. Pollock, C. E. Clayton, J. E. Ralph, F. Albert, A. Davidson, L. Divol, C. Filip, S. H. Glenzer, K. Herpoldt, W. Lu, K. A. Marsh, J. Meinecke, W. B. Mori, A. Pak, T. C. Rensink, J. S. Ross, J. Shaw, G. R. Tynan, C. Joshi, and D. H. Froula, "Demonstration of a Narrow Energy Spread, ~0.5 GeV Electron Beam from a Two-Stage Laser Wakefield Accelerator," Phys. Rev. Lett. **107**, 045001 (2011).

J. E. Schoenly, W. D. Seka, and P. Rechmann, "Near-Ultraviolet Removal Rates for Subgingival Dental Calculus at Different Irradiation Angles," J. Biomed. Opt. **16**, 071404 (2011).

R. Xin and J. D. Zuegel, "Amplifying Nanosecond Optical Pulses at 1053 nm with an All-Fiber Regenerative Amplifier," Opt. Lett. **36**, 2605 (2011).

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J.-H. Yang and R. S. Craxton, "An Empirical Model of Collective Electrostatic Effects for Laser-Beam Channeling in Long-Scale-Length Relativistic Plasmas," Phys. Plasmas **18**, 082703 (2011).

Forthcoming Publications

S. H. Chen and S. K.-H. Wei, "Modification of the Stokes–Einstein Equation with a Semi-Empirical Microfriction Factor for Correlation of Tracer Diffusivities in Organic Solvents," to be published in Industrial and Engineering Chemistry Research.

C. Dorrer, S. K.-H. Wei, P. Leung, M. Vargas, K. Wegman, J. Boulé, Z. Zhao, K. L. Marshall, and S. H. Chen, "High-Damage-Threshold Static Laser Beam Shaping Using Optically Patterned Liquid-Crystal Devices," to be published in Optics Letters.

I. Íñiguez-de-la-Torre, S. Purohit, V. Kaushal, M. Margala, M. Gong, R. Sobolewski, D. Wolpert, P. Ampadu, T. González, and J. Mateos, "Exploring Digital Logic Design Using Nanometer-Scale Devices Through Monte Carlo Simulations," to be published in IEEE Transactions on Nanotechnology.

S. K.-H. Wei, S. H. Chen, K. L. Marshall, C. Dorrer, and S. D. Jacobs, "Azimuthal Anchoring Energy and Pixel Resolution in a Photopatterned Liquid Crystal Cell Using Coumarin-Based Photoalignment Layers," to be published in the Japanese Journal of Applied Physics.

J.-H. Yang, R. S. Craxton, and M. G. Haines, "Explicit General Solutions to Relativistic Electron Dynamics in Plane-Wave Electromagnetic Fields and Simulations of Ponderomotive Acceleration," to be published in Plasma Physics and Controlled Fusion.

Conference Presentations

The following presentations were made at the NAS/NAE ICF Targets Panel, Rochester, NY, 6–8 July 2011:

D. H. Froula, "Laser–Plasma Interaction in Direct-Drive Implosions."

R. L. McCrory, "Overview of LLE's ICF Program."

D. D. Meyerhofer, "Facilitating NIF Polar Drive."

D. D. Meyerhofer, "Shock and Fast Ignition."

P. B. Radha, "Polar-Drive Target Design."

T. C. Sangster, "Direct-Drive Progress on OMEGA."

M. J. Grosskopf, R. P. Drake, C. C. Kuranz, E. M. Rutter, H. S. Park, N. Kugland, S. Pollaine, S. Ross, B. A. Remington, D. Ryutov, A. Spikovsky, L. Gargate, G. Gregori, A. Bell, C. Murphy, Y. Sakawa, Y. Kuramitsu, H. Takabe, D. Froula, G. Fiksel, F. Miniati, M. Koenig, A. Ravasio, E. Liang, and N. Woolsey, "Hydrodynamic Simulation of Laboratory Astrophysics Experiments Generating Collisionless Shocks with Intense Lasers," Interrelationship Between Plasma Experiments in Laboratory and Space, Whistler, Canada, 10–15 July 2011.

D. D. Meyerhofer, "Diagnostics for High-Energy-Density Physics," HEDP Summer School, San Diego, CA, 10–16 July 2011.

P. W. McKenty, "ICF Research at the Laboratory for Laser Energetics: The Path to Polar-Drive Ignition," JOWOG 37, Aldermaston, United Kingdom, 11–15 July 2011.

S. P. Regan, R. Epstein, B. A. Hammel, L. J. Suter, J. Ralph, H. Scott, M. A. Barrios, D. K. Bradley, D. A. Callahan, G. W. Collins, S. Dixit, M. J. Edwards, D. R. Farley, S. H. Glenzer,

I. E. Golovkin, S. W. Haan, A. Hamza, D. G. Hicks, N. Izumi, J. D. Kilkenny, J. L. Kline, G. A. Kyrala, O. L. Landen, T. Ma, J. J. MacFarlane, A. J. MacKinnon, R. C. Mancini, F. J. Marshall, R. L. McCrory, N. B. Meezan, D. D. Meyerhofer, A. Nikroo, K. J. Peterson, T. C. Sangster, P. Springer, and R. P. J. Town, "Diagnosing Implosions at the National Ignition Facility with X-Ray Spectroscopy," 17th International Conference on Atomic Processes and Plasmas, Belfast, Ireland, 19–22 July 2011.

K. L. Marshall, S. K.-H. Wei, M. Vargas, K. Wegman, C. Dorrer, P. Leung, J. Boule III, Z. Zhao, and S. H. Chen, "Liquid Crystal Beam-Shaping Devices Employing Patterned Photoalignment Layers for High-Peak-Power Laser Applications," SPIE Optics and Photonics, Liquid Crystals XV, San Diego, CA, 21–25 August 2011.

S. D. Jacobs, "MRF with Adjustable pH," Optical Fabrication, Testing and Metrology IV, Marseille, France, 5–8 September 2011.

The following presentations were made at the 7th International Conference on Inertial Fusion Sciences and Applications, Bordeaux, France, 12–16 September 2011:

R. L. McCrory, D. D. Meyerhofer, R. Betti, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, D. H. Edgell, R. Epstein, D. H. Froula, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, S. X. Hu, I. V. Igumenshchev, J. P. Knauer, S. J. Loucks, J. A. Marozas, F. J. Marshall, P. W. McKenty, T. Michel, P. M. Nilson, P. B. Radha, S. P. Regan, T. C. Sangster, W. Seka, R. W. Short, D. Shvarts, S. Skupsky, V. A. Smalyuk, J. M. Soures, C. Stoeckl, W. Theobald, B. Yaakobi, J. A. Frenje, D. T. Casey, C. K. Li, R. D. Petrasso, F. H. Séguin, S. P. Padalino, K. A. Fletcher, P. M. Celliers, G. W. Collins, and H. F. Robey, "Progress in Direct-Drive Inertial Confinement Fusion."

P. W. McKenty, T. J. B. Collins, J. A. Marozas, T. J. Kessler, J. D. Zuegel, M. J. Shoup III, R. S. Craxton, F. J. Marshall, A. Shvydky, S. Skupsky, V. N. Goncharov, P. B. Radha, R. Epstein, T. C. Sangster, D. D. Meyerhofer, R. L. McCrory, J. D. Kilkenny, A. Nikroo, M. L. Hoppe, M. M. Marinak, A. J. MacKinnon, M. J. Schmitt, P. A. Bradley, G. R. Magelssen, and T. J. Murphy, "Preparing for Polar-Drive Ignition on the NIF."

H.-S. Park, N. Kugland, S. Ross, B. Remington, S. Pollaine, D. Ryutov, A. Spitkovsky, L. Gargate, G. Gregori, A. Bell, C. Murphy, Y. Sakawa, Y. Kuramitsu, H. Takabe, D. Froula, G. Fiksel, F. Miniati, M. Koenig, A. Ravasio, E. Liang, N. Woolsey, and M. Grosskopf, "Collisionless Shocks in Laser Driven Laboratory High Energy Density Plasmas."

P. B. Radha, F. J. Marshall, T. R. Boehly, T. J. B. Collins, R. S. Craxton, D. H. Edgell, R. Epstein, J. A. Frenje, V. N. Goncharov, J. A. Marozas, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, R. D. Petrasso, T. C. Sangster, A. Shvydky, and S. Skupsky, "Polar Drive on OMEGA."

S. P. Regan, R. Epstein, B. A. Hammel, L. J. Suter, J. Ralph, H. Scott, M. A. Barrios, D. K. Bradley, D. Callahan, C. Cerjan, G. W. Collins, S. N. Dixit, J. Edwards, D. R. Farley, S. Glenn, S. H. Glenzer, I. E. Golovkin, S. W. Haan, A. Hamza, D. G. Hicks, N. Izumi, J. D. Kilkenny, J. L. Kline, G. A. Kyrala, O. L. Landen, T. Ma, J. J. MacFarlane, R. C. Mancini, R. L. McCrory, N. B. Meezan, D. D. Meyerhofer, A. Nikroo, K. J. Peterson, T. C. Sangster, P. Springer, and R. P. J. Town, "Diagnosing Implosions at the National Ignition Facility with X-Ray Spectroscopy."

A. Richard, V. Allouche, E. Alozy, F. Aubard, S. Bazzoli, T. Beck, J. Baggio, J. L. Bourgade, J. Y. Boutin, M. Briat, S. Brygoo, T. Caillaud, C. Cherfils, C. Chollet, P. Combis, S. Darbon, D. Dennettière, J. L. Desmeuzes, A. Duval, J. Fariat, J. Favier, S. Gary, J. Gazave, S. Girard, V. Glebov, J. C. Gomme, D. Gontier, O. Henry, S. Huevlan, H. P. Jacquet, J. P. Jadaud, O. Landoas, P. Llavador, B. Marchet, R. Marmoret, R. Maroni, I. Masclet-Gobin, D. D. Meyerhofer, J. P. Le Breton, G. Oudot, S. Perez, G. Pien, J. Raimbourg, C. Reverdin, P. Romary, R. Rosch, B. Rosse, A. Rousseau, D. Rubin de Cervens, T. C. Sangster, C. Schoech, P. Semécurbe, G. Souillé, P. Stemmler, C. Stoeckl, I. Thfoin, C. Trosseille, P. Troussel, J. L. Ulmer, L. Videau, B. Villette, R. Wrobel, and C. Zuber, "Diagnosis Development for Plasma Experiments on LMJ."

T. C. Sangster, E. J. Bond, J. A. Caggiano, D. T. Casey, M. J. Eckart, J. A. Frenje, S. Friedrich, M. Gatu-Johnson, V. Yu. Glebov, E. P. Hartouni, R. Hatarik, S. P. Hatchett, H. W. Herrmann, C. J. Horsfield, M. Hutton, J. D. Kilkenny, J. P. Knauer, R. A. Lerche, J. McNaney, M. J. Moran, D. H. Munro, S. J. Padalino, P. K. Patel, D. Schneider, and C. Stoeckl, "High-Accuracy Ion-Temperature and Areal-Density Measurements with the NIF nTOF Suite."

W. Theobald, A. Casner, R. Nora, X. Ribeyre, K. S. Anderson, R. Betti, R. S. Craxton, J. A. Delettrez, J. A. Frenje, V. Yu. Glebov, O. V. Gotchev, M. Hohenberger, M. Lafon, F. J. Marshall, R. L. McCrory, D. D. Meyerhofer, L. J. Perkins, T. C. Sangster, G. Schurtz, W. Seka, V. A. Smalyuk, C. Stoeckl, and B. Yaakobi, "Progress in the Shock-Ignition Inertial Confinement Fusion Concept."

J. D. Zuegel, C. Dorrer, I. A. Begishev, R. Cuffney, T. J. B. Collins, E. Hill, J. H. Kelly, B. E. Kruschwitz, J. A. Marozas, P. W. McKenty, A. V. Okishev, R. G. Roides, D. F. Browning, G. V. Erbert, and M. W. Bowers, "Polar-Drive Beam Smoothing for Direct-Drive Ignition on the National Ignition Facility."

D. H. Froula, "Laser–Plasma Interactions in Direct-Drive Implosions," Assessment of Inertial Confinement Fusion Targets, Washington, DC, 20–21 September 2011.

The following presentations were made at Ultrafast Optics 2011, Monterey, CA, 26–30 September 2011:

J. Bromage, C. Dorrer, and R. K. Jungquist, "Temporal Contrast Degradation at the Focus of Ultrafast Pulses from High-Frequency Spectral Phase Modulation."

J. Bromage, M. Millecchia, J. Bunkenburg, R. K. Jungquist, C. Dorrer, and J. D. Zuegel, "A Cylindrical Öffner Stretcher Design for Reduced Chromatic Aberrations and Improved Temporal Contrast in Ultrafast Laser Systems."

C. Dorrer, "Interferometric Techniques for Optical-Pulse Characterization."

J. Qiao, P. A. Jaanimagi, R. Boni, J. Bromage, and E. Hill, "Measuring Short Pulse Using a High-Speed Streak Camera on Kilojoule, Petawatt-Class Laser Systems."

R. Xin and J. D. Zuegel, "All-Fiber Directly Chirped Laser Source (DCLS) for Chirped-Pulse Amplification."