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## Publications and Conference Presentations

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### Publications

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- S.-W. Bahk, C. Dorrer, R. G. Roides, and J. Bromage, "Chromatic-Aberration Diagnostic Based on a Spectrally Resolved Lateral-Shearing Interferometer," *Appl. Opt.* **55**, 2413 (2016).
- E. L. Dewald, F. Hartemann, P. Michel, J. Milovich, M. Hohenberger, A. Pak, O. L. Landen, L. Divol, H. F. Robey, O. A. Hurricane, T. Döppner, F. Albert, B. Bachmann, N. B. Meezan, A. J. MacKinnon, D. Callahan, and M. J. Edwards, "Generation and Beaming of Early Hot Electrons onto the Capsule in Laser-Driven Ignition Hohlraums," *Phys. Rev. Lett.* **116**, 075003 (2016).
- T. Döppner, D. A. Callahan, O. A. Hurricane, D. E. Hinkel, T. Ma, H.-S. Park, L. F. Berzak Hopkins, D. T. Casey, P. Celliers, E. L. Dewald, T. R. Dittrich, S. W. Haan, A. L. Kritcher, A. MacPhee, S. Le Pape, A. Pak, P. K. Patel, P. T. Springer, J. D. Salmonson, R. Tommasini, L. R. Benedetti, E. Bond, D. K. Bradley, J. Caggiano, J. Church, S. Dixit, D. Edgell, M. J. Edwards, D. N. Fittinghoff, J. Frenje, M. Gatu Johnson, G. Grim, R. Hatarik, M. Havre, H. Herrmann, N. Izumi, S. F. Khan, J. L. Kline, J. Knauer, G. A. Kyrala, O. L. Landen, F. E. Merrill, J. Moody, A. S. Moore, A. Nikroo, J. E. Ralph, B. A. Remington, H. F. Robey, D. Sayre, M. Schneider, H. Streckert, R. Town, D. Turnbull, P. L. Volegov, A. Wan, K. Widmann, C. H. Wilde, and C. Yeamans, "Demonstration of High Performance in Layered Deuterium-Tritium Capsule Implosions in Uranium Hohlraums at the National Ignition Facility," *Phys. Rev. Lett.* **115**, 055001 (2015).
- C. Dorrer, L. J. Waxer, A. Kalb, E. M. Hill, and J. Bromage, "Single-Shot, High-Resolution, Fiber-Based Phase-Diversity Photodetection of Optical Pulses," *Proc. SPIE* **9732**, 97320P (2016).
- A. J. Harvey-Thompson, A. B. Sefkow, T. N. Nagayama, M. S. Wei, E. M. Campbell, G. Fiksel, P.-Y. Chang, J. R. Davies, D. H. Barnak, V. Y. Glebov, P. Fitzsimmons, J. Fooks, and B. E. Blue, "Diagnosing Laser-Preheated Magnetized Plasmas Relevant to Magnetized Liner Inertial Fusion," *Phys. Plasmas* **22**, 122708 (2015).
- V. V. Ivanov, A. A. Anderson, and I. A. Begishev, "Four-Color Laser Diagnostics for Z-Pinch and Laser-Produced Plasma," *Appl. Opt.* **55**, 498 (2016).
- L. C. Jarrott, M. S. Wei, C. McGuffey, A. A. Solodov, W. Theobald, B. Qiao, C. Stoeckl, R. Betti, H. Chen, J. Delettrez, T. Döppner, E. M. Giraldez, V. Y. Glebov, H. Habara, T. Iwawaki, M. H. Key, R. W. Luo, F. J. Marshall, H. S. McLean, C. Mileham, P. K. Patel, J. J. Santos, H. Sawada, R. B. Stephens, T. Yabuuchi, and F. N. Beg, "Visualizing Fast Electron Energy Transport into Laser-Compressed High-Density Fast-Ignition Targets," *Nat. Phys.* **12**, 499 (2016).
- H. M. Johns, R. C. Mancini, T. Nagayama, D. C. Mayes, R. Tommasini, V. A. Smalyuk, S. P. Regan, and J. A. Delettrez, "Shell Stability and Conditions Analyzed Using a New Method of Extracting Shell Areal Density Maps from Spectrally Resolved Images of Direct-Drive Inertial Confinement Fusion Implosions," *Phys. Plasmas* **23**, 012709 (2016).
- J. D. Kilkenny, P. M. Bell, D. K. Bradley, D. L. Bleuel, J. A. Caggiano, E. L. Dewald, W. W. Hsing, D. H. Kalantar, R. L. Kauffman, D. J. Larson, J. D. Moody, D. H. Schneider, M. B. Schneider, D. A. Shaughnessy, R. T. Shelton, W. Stoeffl, K. Widmann, C. B. Yeamans, S. H. Batha, G. P. Grim, H. W. Herrmann, F. E. Merrill, R. J. Leeper, J. A. Oertel, T. C. Sangster, D. H. Edgell, M. Hohenberger, V. Yu. Glebov, S. P. Regan, J. A. Frenje, M. Gatu-Johnson, R. D. Petrasso, H. G. Rinderknecht, A. B. Zylstra, G. W. Cooper, and C. Ruiz, "The National Ignition Facility Diagnostic Set at the Completion of the National Ignition Campaign, September 2012," *Fusion Sci. Technol.* **69**, 420 (2016).

F. J. Marshall, P. B. Radha, M. J. Bonino, J. A. Delettrez, R. Epstein, V. Yu. Glebov, D. R. Harding, C. Stoeckl, J. A. Frenje, M. Gatu Johnson, F. H. Séguin, H. Sio, A. Zylstra, and E. Giraldez, “Polar-Direct-Drive Experiments with Contoured-Shell Targets on OMEGA,” *Phys. Plasmas* **23**, 012711 (2016).

P. E. Masson-Laborde, M. C. Monteil, V. Tassin, F. Philippe, P. Gauthier, A. Casner, S. Depierreux, C. Neuville, B. Villette, S. Laffite, P. Seytor, P. Fremerye, W. Seka, D. Teychenné, A. Debayle, D. Marion, P. Loiseau, and M. Casanova, “Laser Plasma Interaction on Rugby Hohlräum on the Omega Laser Facility: Comparisons Between Cylinder, Rugby, and Elliptical Hohlräume,” *Phys. Plasmas* **23**, 022703 (2016).

Y. Ping, A. Fernandez-Panella, H. Sio, A. Correa, R. Shepherd, O. Landen, R. A. London, P. A. Sterne, H. D. Whitley, D. Fratanduono, T. R. Boehly, and G. W. Collins, “Differential Heating: A Versatile Method for Thermal Conductivity Measurements in High-Energy-Density Matter,” *Phys. Plasmas* **22**, 092701 (2015).

M. J. Rosenberg, A. B. Zylstra, F. H. Séguin, H. G. Rinderknecht, J. A. Frenje, M. Gatu Johnson, H. Sio, C. J. Waugh, N. Sinenian, C. K. Li, R. D. Petrasso, S. LePape, T. Ma, A. J. Mackinnon, J. R. Rygg, P. A. Amendt, C. Bellei, L. R. Benedetti, L. Berzak Hopkins, R. M. Bionta, D. T. Casey, L. Divol, M. J. Edwards, S. Glenn, S. H. Glenzer, D. G. Hicks, J. R. Kimbrough, O. L. Landen, J. D. Lindl, A. MacPhee, J. M. McNaney, N. B. Meezan, J. D. Moody, M. J. Moran, H.-S. Park, J. Pino, B. A. Remington, H. Robey, M. D. Rosen, S. C. Wilks, R. A. Zacharias, P. W. McKenty, M. Hohenberger, P. B. Radha, D. Edgell, F. J. Marshall, J. A. Delettrez, V. Yu. Glebov, R. Betti, V. N. Goncharov, J. P. Knauer, T. C. Sangster, H. W. Herrmann, N. M. Hoffman, G. A. Kyrala, R. J. Leeper, R. E. Olson, J. D. Kilkenny, and A. Nikroo, “A Direct-Drive Exploding-Pusher Implosion as the First Step in Development of a Monoenergetic Charged-Particle Backlighting Platform at the National Ignition Facility,” *High Energy Density Phys.* **18**, 38 (2016).

M. Rutkauskas, C. Farrell, C. Dorrer, K. L. Marshall, T. R. Lundquist, P. Vedagarbha, and D. T. Reid, “High-Resolution Subsurface Microscopy of CMOS Integrated Circuits Using Radially Polarized Light,” *Opt. Lett.* **40**, 5502 (2015).

S. Salzman, H. J. Romanofsky, L. J. Giannchini, S. D. Jacobs, and J. C. Lambropoulos, “Magnetorheological Finishing of Chemical-Vapor Deposited Zinc Sulfide via Chemically and Mechanically Modified Fluids,” *Appl. Opt.* **55**, 1481 (2016).

S. Salzman, H. J. Romanofsky, S. D. Jacobs, and J. C. Lambropoulos, “Surface-Texture Evolution of Different Chemical-Vapor-Deposited Zinc Sulfide Flats Polished with Various Magnetorheological Fluids,” *Prec. Eng.* **43**, 257 (2016).

J. Serafini, Y. Akbas, L. Crandall, R. Bellman, C. K. Williams, and R. Sobolewski, “Time-Resolved, Nonequilibrium Carrier Dynamics in Si-on-Glass Thin Films for Photovoltaic Cells,” *Semicond. Sci. Technol.* **31**, 045006 (2016).

W. Shang, J. Yang, W. Zhang, Z. Li, B. Deng, Y. Dong, T. Zhu, C. Huang, X. Zhan, Y. Mei, L. Guo, R. Yu, S. Li, S. Jiang, S. Liu, F. Wang, Y. Ding, B. Zhang, and R. Betti, “Experimental Demonstration of Laser to X-Ray Conversion Enhancements with Low Density Gold Targets,” *Appl. Phys. Lett.* **108**, 064102 (2016).

S. A. Slutz, W. A. Stygar, M. R. Gomez, K. J. Peterson, A. B. Sefkow, D. B. Sinars, R. A. Vesey, E. M. Campbell, and R. Betti, “Scaling Magnetized Liner Inertial Fusion on Z and Future Pulsed-Power Accelerators,” *Phys. Plasmas* **23**, 022702 (2016).

J. Wang, F. Coppari, R. F. Smith, J. H. Eggert, A. E. Lazicki, D. E. Frantanduono, J. R. Rygg, T. R. Boehly, G. W. Collins, and T. S. Duffy, “X-Ray Diffraction of Molybdenum Under Shock Compression to 450 GPa,” *Phys. Rev. B* **92**, 174114 (2015).

R. Yan, R. Betti, J. Sanz, H. Aluie, B. Liu, and A. Frank, “Three-Dimensional Single-Mode Nonlinear Ablative Rayleigh-Taylor Instability,” *Phys. Plasmas* **23**, 022701 (2016).

### Forthcoming Publications

B. P. Chock, T. B. Jones, and D. R. Harding, “Effect of a Surfactant on the Electric-Field Assembly of Oil/Water Emulsions for Making Foam Targets,” to be published in *Fusion Science and Technology*.

T. J. B. Collins, J. A. Marozas, S. Skupsky, D. Cao, P. W. McKenty, J. A. Delettrez, and G. Moses, “Design Options for Polar-Direct-Drive Targets—From Alpha Heating to Ignition,” to be published in the *Journal of Physics: Conference Series*.

A. K. Davis, D. Cao, D. T. Michel, M. Hohenberger, R. Epstein, V. N. Goncharov, S. X. Hu, I. V. Igumenshchev, J. A. Marozas, A. V. Maximov, J. F. Myatt, P. B. Radha, S. P. Regan, T. C. Sangster, and D. H. Froula, “Isolating and Quantifying Cross-Beam Energy Transfer in Direct-Drive Implosions,” to be published in *Physics of Plasmas* (invited).

B. Delorme, M. Olzazbal-Loumé, A. Casner, Ph. Nicolaï, D. T. Michel, G. Riazuelo, N. Borisenko, J. Breil, S. Fujioka, M. Grech, A. Orekhov, W. Seka, A. Sunahara, D. H. Froula, V. Goncharov, and V. T. Tikhonchuk, “Experimental Demonstration of Laser Imprint Reduction Using Underdense Foams,” to be published in *Physics of Plasmas*.

W. R. Donaldson, J. Katz, R. Huff, E. M. Hill, J. H. Kelly, J. Kwiatkowski, R. Brannon, and R. Boni, “Picosecond Beam-Timing System for the OMEGA Laser,” submitted to *Review of Scientific Instruments*.

R. Epstein, S. P. Regan, B. A. Hammel, L. J. Suter, H. A. Scott, M. A. Barrios, D. K. Bradley, D. A. Callahan, C. Cerjan, G. W. Collins, S. N. Dixit, T. Döppner, M. J. Edwards, D. R. Farley, K. B. Fournier, S. Glenn, S. H. Glenzer, I. E. Golovkin, A. Hamza, D. G. Hicks, N. Izumi, O. S. Jones, M. H. Key, J. D. Kilkenny, J. L. Kline, G. A. Kyrala, O. L. Landen, T. Ma, J. J. MacFarlane, A. J. Mackinnon, R. C. Mancini, R. L. McCrory, D. D. Meyerhofer, N. B. Meezan, A. Nikroo, H.-S. Park, P. K. Patel, J. E. Ralph, B. A. Remington, T. C. Sangster, V. A. Smalyuk, P. T. Springer, R. P. J. Town, and J. L. Tucker, “Applications and Results of X-Ray Spectroscopy in Implosion Experiments at the National Ignition Facility,” to be published in *Proceedings of Atomic Processes in Plasmas* (invited).

R. K. Follett, J. A. Delettrez, D. H. Edgell, V. N. Goncharov, R. J. Hennen, J. Katz, D. T. Michel, J. F. Myatt, J. G. Shaw, A. A. Solodov, C. Stoeckl, B. Yaakobi, and D. H. Froula, “Two-Plasmon–Decay Mitigation in Direct-Drive Inertial Confinement Fusion Experiments Using Multilayer Targets,” to be published in *Physical Review Letters*.

D. R. Harding, D. C. Whitaker, and C. Fella, “Growth of a Solid DT Crystal from the Liquid Inside Inertial Confinement Fusion Targets,” to be published in *Fusion Science and Technology*.

S. X. Hu, L. A. Collins, V. N. Goncharov, J. D. Kress, T. R. Boehly, R. Epstein, R. L. McCrory, and S. Skupsky, “First-Principles Studies on the Equation-of-State, Thermal-Conductivity, and Opacity of Deuterium–Tritium and Polystyrene (CH) for

Inertial Confinement Fusion Applications,” to be published in the *Journal of Physics: Conference Series*.

S. X. Hu, L. A. Collins, V. N. Goncharov, J. D. Kress, R. L. McCrory, and S. Skupsky, “First-Principles Investigations on Ionization and Thermal Conductivity of Polystyrene (CH) for Inertial Confinement Fusion Applications,” to be published in *Physics of Plasmas*.

I. V. Igumenshchev, V. N. Goncharov, F. J. Marshall, J. P. Knauer, E. M. Campbell, D. H. Froula, R. L. McCrory, S. P. Regan, T. C. Sangster, and S. Skupsky, “Three-Dimensional Modeling of Direct-Drive Cryogenic Implosions on OMEGA,” to be published in *Physics of Plasmas*.

J. D. Kilkenny, J. A. Caggiano, R. Hatarik, J. P. Knauer, D. B. Sayre, B. K. Spears, S. V. Weber, C. B. Yeaman, C. J. Cerjan, L. Divol, M. J. Eckart, V. Yu. Glebov, H. W. Herrmann, S. Le. Pape, D. H. Munro, G. P. Grim, O. S. Jones, L. Berzak-Hopkins, M. Gatu-Johnson, A. J. Mackinnon, N. B. Meezan, D. T. Casey, J. A. Frenje, J. M. Mcnaney, R. Petrasso, H. Rinderknecht, W. Stoeffl, and A. B. Zylstra, “Understanding the Stagnation and Burn of Implosions on NIF,” to be published in the *Journal of Physics: Conference Series*.

J. A. Marozas, T. J. B. Collins, J. D. Zuegel, P. W. McKenty, D. Cao, S. Fochs, and P. B. Radha, “Continuous Distributed Phase Plate Design Advances for High-Energy Laser Systems,” to be published in the *Journal of Physics: Conference Series*.

J. F. Myatt, J. G. Shaw, V. N. Goncharov, J. Zhang, A. V. Maximov, R. W. Short, R. K. Follett, W. Seka, D. H. Edgell, and D. H. Froula, “Laser–Plasma Interaction in Direct-Drive Inertial Confinement Fusion,” to be published in the *Journal of Physics: Conference Series*.

B. W. Plansinis, W. R. Donaldson, and G. P. Agrawal, “Temporal Waveguides for Optical Pulses,” to be published in the *Journal of the Optical Society of America B*.

P. B. Radha, V. N. Goncharov, M. Hohenberger, T. C. Sangster, R. Betti, R. S. Craxton, D. H. Edgell, R. Epstein, D. H. Froula, J. A. Marozas, F. J. Marshall, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, D. T. Michel, S. X. Hu, W. Seka, A. Shvydky, S. Skupsky, J. A. Frenje, M. Gatu Johnson, R. D. Petrasso, T. Ma, S. Le Pape, and A. J. Mackinnon, “Direct-Drive-Implosion Physics: Results from OMEGA and the National Ignition Facility,” to be published in the *Journal of Physics: Conference Series*.

P. B. Radha, M. Hohenberger, D. H. Edgell, J. A. Marozas, F. J. Marshall, D. T. Michel, M. J. Rosenberg, W. Seka, A. Shvydky, J. W. Bates, T. R. Boehly, T. J. B. Collins, E. M. Campbell, R. S. Craxton, J. A. Delettrez, S. N. Dixit, J. A. Frenje, D. H. Froula, V. N. Goncharov, S. X. Hu, M. Karasik, J. P. Knauer, S. Le Pape, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, J. F. Myatt, S. P. Obenschain, R. D. Petrasso, S. P. Regan, T. C. Sangster, H. Sio, S. Skupsky, and A. B. Zylstra, "Direct Drive: Simulations and Results from the National Ignition Facility," to be published in *Physics of Plasmas* (invited).

P. B. Radha, M. Hohenberger, F. J. Marshall, D. T. Michel, J. W. Bates, T. R. Boehly, T. J. B. Collins, R. S. Craxton, J. A. Delettrez, S. N. Dixit, D. H. Edgell, J. A. Frenje, D. H. Froula, V. N. Goncharov, S. X. Hu, M. Karasik, J. P. Knauer, S. Le Pape, J. A. Marozas, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, J. F. Myatt, S. P. Obenschain, R. D. Petrasso, S. P. Regan, M. J. Rosenberg, T. C. Sangster, W. Seka, A. Shvydky, H. Sio, S. Skupsky, and A. B. Zylstra, "Polar-Direct-Drive Experiments at the National Ignition Facility," to be published in the *Journal of Physics: Conference Series*.

M. Sharpe, W. T. Shmayda, and W. U. Schröder, "Tritium Migration to the Surfaces of Stainless-Steel 316, Aluminum 6061, and Oxygen-Free, High-Conductivity Copper," to be published in *Fusion Science and Technology*.

W. T. Shmayda, M. D. Wittman, R. F. Earley, J. L. Reid, and N. P. Redden, "The Laboratory for Laser Energetics' Hydrogen Isotope Separation System," to be published in *Fusion Engineering and Design* (invited).

C. Stoeckl, R. Boni, F. Ehrne, C. J. Forrest, V. Yu. Glebov, J. Katz, D. J. Lonobile, J. Magoon, S. P. Regan, M. J. Shoup III, A. Sorce, T. C. Sangster, and D. Weiner, "A Neutron Temporal Diagnostic for High-Yield DT Cryogenic Implosions on OMEGA," to be published in *Review of Scientific Instruments*.

N. D. Viza, M. H. Romanofsky, M. J. Moynihan, and D. R. Harding, "The Effect of a Surfactant on the Operation of T-Junctions for Mass-Producing Foam Targets," to be published in *Fusion Science and Technology*.

### Conference Presentations

M. J. Rosenberg, A. A. Solodov, W. Seka, R. Epstein, J. F. Myatt, S. P. Regan, M. Hohenberger, T. J. B. Collins, P. Michel, D. P. Turnbull, J. D. Moody, J. E. Ralph, M. A. Barrios, and J. W. Bates, "Planar Laser-Plasma Interaction Experiments at Direct-Drive Ignition-Relevant Scale Lengths at the National Ignition Facility," NIF User Group Meeting, Livermore, CA, 1–3 February 2016.

J. D. Zuegel, A. Agliata, S.-W. Bahk, I. A. Begishev, W. A. Bittle, T. Buczek, J. Bunkenburg, D. Canning, A. Consentino, D. Coppenbarger, R. Cuffney, C. Dorrer, J. Fini, D. H. Froula, G. Gates, M. J. Guardalben, D. Haberberger, S. Hadrich, C. Hall, H. Huang, R. K. Jungquist, C. Kellogg, T. J. Kessler, G. Kick, E. Kowaluk, B. E. Kruschwitz, T. Lewis, J. Magoon, J. Marciante, D. D. Meyerhofer, C. Mileham, M. Millecchia, S. F. B. Morse, P. M. Nilson, A. Okishev, J. B. Oliver, R. G. Peck, C. Rees, B. S. Rice, E. Riedle, A. L. Rigatti, C. Robillard, R. G. Roides, M. H. Romanofsky, J. Rothhardt, M. J. Shoup III, C. Smith, C. Stoeckl, R. Taylor, L. J. Waxer, and D. Weiner, "Technology Development and Prospects for 100-PW-Class

Optical Parametric Chirped-Pulse Amplification Pumped by OMEGA EP," the 2nd International Symposium on High Power Laser Science and Engineering, Suzhou, China, 15–18 March 2016.

The following presentations were made at Industrial Associates, Rochester, NY, 21–22 March 2016:

L. E. McIntire, M. Divoky, W. H. Knox, S.-W. Bahk, and J. D. Zuegel, "High-Contrast, Closed-Loop Control of Continuous-Wave Laser Beam Profiles."

B. W. Plansinis, W. R. Donaldson, and G. P. Agrawal, "Controlling the Optical Pulse Spectrum with an Electro-Optic Phase Modulator."

B. W. Plansinis, W. R. Donaldson, and G. P. Agrawal, "Temporal Waveguiding Caused by Time Reflection and Refraction."

R. Betti, A. R. Christopherson, A. Bose, K. M. Woo, J. Howard, K. S. Anderson, E. M. Campbell, J. A. Delettrez, V. N. Goncharov, F. J. Marshall, R. L. McCrory, S. P. Regan, T. C. Sangster, C. Stoeckl, W. Theobald, M. J. Edwards,

R. Nora, B. K. Spears, and J. Sanz, “The Most Unsolved Problem in Plasma Physics: Demonstrating a Burning Plasma in the Laboratory,” *Solved and Unsolved Problems in Plasma Physics*, Princeton, NJ, 28–30 March 2016 (invited).

