
Publications and Conference Presentations

Publications

- R. Adam, G. Chen, D. E. Bürgler, T. Shou, I. Komissarov, S. Heidtfield, H. Hardtdegen, M. Mikulics, C. M. Schneider, and R. Sobolewski, “Magnetically and Optically Tunable Terahertz Radiation from Ta/NiFe/Pt Spintronic Nanolayers Generated by Femtosecond Laser Pulses,” *Appl. Phys. Lett.* **114**, 212405 (2019).
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- I. A. Begishev, M. Romanofsky, S. Carey, R. Chapman, G. Brent, M. J. Shoup III, J. D. Zuegel, and J. Bromage, “High-Efficiency, Large-Aperture Fifth-Harmonic–Generation of 211-nm Pulses in Ammonium Dihydrogen Phosphate Crystals for Fusion Diagnostics,” *Proc. SPIE* **10898**, 108980N (2019).
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- D. Cao, R. C. Shah, S. P. Regan, R. Epstein, I. V. Igumenshchev, V. Gopalaswamy, A. R. Christopherson, W. Theobald, P. B. Radha, and V. N. Goncharov, “Interpreting the Electron Temperature Inferred from X-Ray Continuum Emission for Direct-Drive Inertial Confinement Fusion Implosions on OMEGA,” *Phys. Plasmas* **26**, 082709 (2019).
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H. Zhou and E. G. Blackman, “Calculating Turbulent Transport Tensors by Averaging Single-Plume Dynamics and Application to Dynamos,” *Mon. Not. R. Astron. Soc.* **483**, L104 (2019).

Conference Presentations

The following presentations were made at the CEA–NNSA Joint Diagnostic Meeting, Le Barp, France, 2–3 October 2018:

S. P. Regan, C. J. Forrest, W. Theobald, C. Sorce, C. Danly, I. V. Igumenshchev, V. N. Goncharov, F. J. Marshall, V. Yu. Glebov, T. C. Sangster, E. M. Campbell, P. Volegov, T. Murphy, C. Wilde, J. Kline, O. Landoas, T. Caillaud, B. Rosse, M. Briat, I. Thfoin, J. L. Bourgade, T. Dautremer, E. Barat, and J. D. Kilkenny, “OMEGA Neutron Imaging Project.”

W. Theobald, “3-D Hot-Spot X-Ray Imaging for OMEGA DT Cryogenic Implosions.”

The following presentations were made at the CELIA Seminar, Bordeaux, France, 3 October 2018:

S. X. Hu, W. Theobald, J. L. Peebles, S. P. Regan, P. B. Radha, D. T. Michel, Y. H. Ding, V. N. Goncharov, T. R. Boehly, R. Epstein, E. M. Campbell, G. Duchateau, A. Casner, V. Tikhonchuk, L. A. Collins, J. D. Kress, and B. Militzer, “Understanding ICF Implosions on OMEGA: From Intrinsic Material Properties to Laser Imprint.”

M. S. Wei, C. M. Krauland, S. Muller, S. Zhang, J. Li, J. L. Peebles, F. N. Beg, W. Theobald, E. Borwick, C. Ren, C. Stoeckl, D. Haberberger, T. Filkins, D. Turnbull, R. Betti, E. M. Campbell, J. Trela, D. Batani, K. Glize, R. Scott, and L. Antonelli, “Laser–Plasma Instabilities and Hot-Electron Generation in the Shock-Ignition Intensity Regime.”

The following presentations were made at the First LMJ–PETAL User Meeting, Bordeaux, France, 4–5 October 2018:

E. M. Campbell, “A Perspective on the Future of ICF and HEDP Research.”

W. Theobald, R. Betti, A. Bose, S. X. Hu, E. M. Campbell, S. P. Regan, C. McCoy, A. Casner, L. Ceurvorst, and M. Karasik, “The Hybrid Target Approach: A Promising Path Forward to Mitigate Laser Imprint in Direct-Drive Inertial Confinement Fusion.”

M. S. Wei and J. M. Soures, “Overview of the Omega Laser Facility and Basic Science User Program.”

E. M. Campbell, “Fusion: Making a Star on Earth and the Quest for the Ultimate Energy Source to Power the Planet,” presented at the AEFM Seminar, Rochester, NY, 11 October 2018.

Y. Zhao, “AlGaIn Metal–Semiconductor–Metal UV Photo-detectors,” presented at Industrial Associates, Rochester, NY, 19 October 2018.

The following presentations were made at the 4th International Conference on High Energy Density Physics, Ningbo, China, 21–25 October 2018:

R. Betti, V. Gopalaswamy, J. P. Knauer, A. R. Christopherson, D. Patel, K. M. Woo, A. Bose, K. S. Anderson, T. J. B. Collins, S. X. Hu, V. Yu. Glebov, A. V. Maximov, C. Stoeckl, F. J. Marshall, M. J. Bonino, D. R. Harding, R. T. Janezic, J. H. Kelly, S. Sampat, T. C. Sangster, S. P. Regan, E. M. Campbell, M. Gatu Johnson, J. A. Frenje, C. K. Li, R. D. Petrasso, and O. A. Hurricane, “Progress Toward Ignition and Burn in Inertial Confinement Fusion.”

D. H. Froula, J. P. Palastro, D. Turnbull, T. J. Kessler, A. Davies, A. Howard, L. Nguyen, D. Ramsey, G. W. Jenkins, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, R. K. Follett, D. Haberberger, J. Katz, and J. L. Shaw, “Flying Focus: Spatiotemporal Control of Intensity for Laser-Based Applications.”

J. P. Knauer, R. Betti, V. Gopalaswamy, M. J. Bonino, E. M. Campbell, T. J. B. Collins, C. J. Forrest, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, O. M. Mannion, J. A. Marozas, F. J. Marshall, P. W. McKenty, D. T. Michel, P. B. Radha, S. P. Regan, T. C. Sangster, C. Stoeckl, M. Gatu Johnson, and J. A. Frenje, “Direct-Drive, High-Adiabatic, Cryogenic Implosion Results from the OMEGA Laser System” (invited).

K. Luo, D. Mejia-Rodriguez, V. V. Karasiev, J. Dufty, and S. B. Trickey, “Development of Free Energy Density Functional Theory: Predictive Power of First Principles Approximations for Warm Dense Matter.”

The following presentations were made at Tritium Focus Group-Sandia, Albuquerque, NM, 22–25 October 2018:

D. Bassler, C. Fagan, W. T. Shmayda, and W. U. Schröder, “Tritium Interactions with Thin Films of Al_2O_3 on Stainless-Steel 316.”

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schroder, “Low-Pressure, Radio-Frequency-Generated Plasma for Tritium Desorption from Metals.”

M. Sharpe, C. Fagan, and W. T. Shmayda, “Influence of Microstructure on the Absorption of Tritium into Gold-Plated 316 Stainless Steel.”

W. T. Shmayda, N. P. Redden, and R. Earley, “Enhancing Gas Chromatography Performance.”

P. B. Radha, “Overview and Status of Direct-Drive Inertial Confinement Fusion in the United States,” presented at the 27th IAEA Fusion Energy Conference (FEC 2018), Ahmedabad, India, 22–27 October 2018.

The following presentations were made at the NIF VISAR Workshop, Livermore, CA, 23–24 October 2018:

M. K. Ginnane, A. Sorce, J. D. Kendrick, R. Boni, B. Saltzman, D. Weiner, M. Zaghou, D. N. Polsin, B. J. Henderson, J. Zou, M. Couch, C. M. Rogoff, M. C. Gregor, T. R. Boehly, J. R. Rygg, and G. W. Collins, “Improvements to the VISAR and Streaked Optical Pyrometer at the Omega Laser Facility.”

J. L. Peebles, S. X. Hu, V. N. Goncharov, N. Whiting, P. M. Celliers, S. J. Ali, G. Duchateau, E. M. Campbell, T. R. Boehly, and S. P. Regan, “First Direct-Drive Measurements of Laser-Imprint-Induced Shock-Velocity Nonuniformities on OMEGA.”

The following presentations were made at the U.S.-Japan Workshop on Theory and Simulations of High-Field and High-Energy-Density Physics, Portland OR, 3–4 November 2018:

A. Howard, D. Turnbull, A. Davies, D. H. Froula, and J. P. Palastro, “Photon Acceleration in the Ionization Front of a Flying Focus.”

P. M. Nilson, F. Ehrne, C. Mileham, D. Mastro Simone, C. Taylor, R. K. Jungquist, R. Boni, J. Hassett, C. R. Stillman, S. T. Ivancic, D. J. Lonobile, R. W. Kidder, M. J. Shoup III, A. B. Sefkow, A. A. Solodov, W. Theobald, C. Stoeckl, S. X. Hu, D. H. Froula, K. W. Hill, L. Gao, M. Bitter, P. Efthimion, I. Golovkin, and D. D. Meyerhofer, “High-Resolving-Power, Streaked X-Ray Spectroscopy of Picosecond-Scale Relativistic Laser-Matter Interactions on the OMEGA EP Laser System.”

J. L. Peebles, J. R. Davies, D. H. Barnak, A. B. Sefkow, P. A. Gourdain, R. Betti, and A. Arefiev, “Characterizing Magnetic and Electric Fields from Laser-Driven Coils Using Axial Proton Probing.”

H. Rinderknecht, H.-S. Park, J. S. Ross, P. A. Amendt, D. P. Higginson, S. C. Wilks, R. K. Follett, D. Haberberger, J. Katz, D. H. Froula, N. M. Hoffman, G. Kagan, B. Keenan,

A. Simakov, L. Chacon, and E. Vold, “Ion-Velocity Structure in Strong Collisional Plasma Shocks.”

The following presentations were made at the 60th Annual APS Division of Plasma Physics, Portland OR, 5–9 November 2018:

K. S. Anderson, C. J. Forrest, O. M. Mannion, D. T. Michel, R. C. Shah, J. A. Marozas, P. B. Radha, F. J. Marshall, J. P. Knauer, R. Epstein, V. Gopalaswamy, M. Gatu Johnson, and S. Laffite, “Modeling of Target Offset in Warm Implosions on OMEGA.”

D. Cao, R. C. Shah, S. P. Regan, C. Sorce, R. Epstein, I. V. Igumenshchev, V. Gopalaswamy, A. R. Christopherson, W. Theobald, P. B. Radha, and V. N. Goncharov, “Using the 10 to 20 keV X-Ray Spectrum to Infer an Electron Temperature (T_e) as an Implosion Diagnostic on OMEGA.”

D. A. Chin, P. M. Nilson, G. W. Collins, T. R. Boehly, J. R. Rygg, F. Coppari, Y. Ping, D. Trail, I. Szumila, and M. Harmand “Interpreting EXAFS Spectra: Toward Ramp-Compression Studies of Iron Oxide (FeO).”

A. R. Christopherson, R. Betti, S. Miller, V. Gopalaswamy, D. Cao, D. Keller, and J. D. Lindl, “Thermonuclear Ignition and the Onset of Propagating Burn in Inertial Fusion.”

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghou, D. N. Polsin, B. J. Henderson, X. Gong, L. Crandall, R. Saha, J. J. Ruby, G. Tabak, M. Huff, Z. Sprowal, A. Chin, M. K. Ginnane, P. M. Celliers, J. H. Eggert, A. Lazicki, R. F. Smith, R. Hemley, F. Coppari, B. Bachman, J. Gaffney, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, D. G. Braun, S. Hamel, M. Milllot, M. Gorman, R. Briggs, S. Ali, R. Kraus, M. McMahon, S. Brygoo, R. Jeanloz, R. Falcone, F. N. Beg, C. Bolme, A. Gleason, S. H. Glenzer, H. J. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, “Matter at Extreme Energy Density: Exotic Solids to Inertial Fusion” (invited).

T. J. B. Collins, C. Stoeckl, R. Epstein, R. Betti, J. A. Delettrez, W. Bittle, C. J. Forrest, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, I. V. Igumenshchev, D. W. Jacobs-Perkins, R. T. Janezic, J. H. Kelly, T. Z. Kosc, C. Mileham, D. T. Michel, R. L. McCrory, P. W. McKenty, F. J. Marshall, S. F. B. Morse, P. B. Radha, S. P. Regan, B. Rice, T. C. Sangster, M. J. Shoup III, W. T. Shmayda, C. Sorce, W. Theobald, J. Ulreich,

M. D. Wittman, J. A. Frenje, M. Gatu Johnson, and R. D. Petrasso, “Cryogenic Target Performance and Fuel-Ablator Perturbation Growth.”

L. Crandall, J. R. Rygg, G. W. Collins, T. R. Boehly, M. Zaghou, P. M. Celliers, D. E. Fratanduono, M. C. Gregor, A. Jenei, M. Millot, J. H. Eggert, and D. Spaulding, “Equation-of-State Measurements of Precompressed CO₂.”

R. S. Craxton, Y. Yang, E. M. Garcia, P. W. McKenty, M. J. Schmitt, and K. Molvig, “*Revolver* Designs for the National Ignition Facility Using Current and Optimized Phase Plates.”

A. Davies, J. Katz, S. Bucht, D. Haberberger, J. P. Palastro, I. A. Begishev, J. L. Shaw, D. Turnbull, R. Boni, D. H. Froula, and W. Rozmus, “Ultrafast Thomson Scattering and the Effects of Collisions on the Electron Plasma Wave Feature.”

J. R. Davies, D. H. Barnak, R. Betti, P.-Y. Chang, V. Yu. Glebov, E. C. Hansen, J. P. Knauer, J. L. Peebles, A. B. Sefkow, K. J. Peterson, and D. B. Sinars, “Laser-Driven Magnetized Liner Inertial Fusion on OMEGA” (invited).

Y. H. Ding, S. X. Hu, A. J. White, O. Certik, and L. A. Collins, “*Ab Initio* Studies on Stopping Power of Warm Dense Matter with Time-Dependent Orbital-Free Density Functional Theory.”

D. H. Edgell, R. K. Follett, J. Katz, J. P. Palastro, D. Turnbull, and D. H. Froula, “Density Profile Measurements on OMEGA Using the CBET Beamlets Diagnostic.”

R. Epstein, C. Stoeckl, P. B. Radha, T. J. B. Collins, P. W. McKenty, D. Cao, R. C. Shah, D. Cliche, and R. C. Mancini, “Inferring Shell Nonuniformity in OMEGA Implosions by Self-Emission Radiography.”

R. K. Follett, J. G. Shaw, D. H. Edgell, D. H. Froula, C. Dorrer, J. Bromage, E. M. Campbell, E. M. Hill, T. J. Kessler, J. P. Palastro, J. F. Myatt, J. W. Bates, and J. L. Weaver, “Suppressing Parametric Instabilities with Laser Frequency Detuning and Bandwidth” (invited).

C. J. Forrest, K. S. Anderson, V. Yu. Glebov, V. Gopalaswamy, V. N. Goncharov, J. P. Knauer, O. M. Mannion, P. B. Radha, S. P. Regan, T. C. Sangster, R. C. Shah, C. Stoeckl, J. A. Frenje, and M. Gatu Johnson, “Evaluating the Residual Kinetic Energy in Direct-Drive Cryogenic Implosions on OMEGA.”

- P. Franke, D. Turnbull, J. P. Palastro, J. Katz, I. A. Begishev, R. Boni, J. Bromage, A. L. Milder, J. L. Shaw, and D. H. Froula, "Ionization Waves of Arbitrary Velocity."
- D. H. Froula, J. P. Palastro, D. Turnbull, T. J. Kessler, A. Davies, P. Franke, A. Howard, L. Nguyen, D. Ramsey, G. W. Jenkins, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, R. K. Follett, D. Haberberger, J. Katz, J. L. Shaw, F. A. Hegmann, D. Purschke, N. Vafaei-Najafabadi, J. Vieira, and F. Quéré, "Flying Focus: Spatial and Temporal Control of Intensity for Laser Based Application" (invited).
- M. K. Ginnane, A. Sorce, J. D. Kendrick, R. Boni, B. Saltzman, D. Weiner, M. Zaghoo, D. N. Polsin, B. J. Henderson, J. Zou, M. Couch, C. M. Rogoff, M. C. Gregor, T. R. Boehly, J. R. Rygg, and G. W. Collins, "Improvements to the VISAR and Streaked Optical Pyrometer at the Omega Laser Facility."
- V. Yu. Glebov, C. J. Forrest, J. P. Knauer, O. M. Mannion, S. P. Regan, T. C. Sangster, C. Stoeckl, M. J. Eckart, G. P. Grim, A. S. Moore, and D. J. Schlossberg, "DT Yield and Ion Temperature Measurement with a Cherenkov Neutron Time-of-Flight Detector on OMEGA."
- V. N. Goncharov, "Perturbation Evolution at Early Stages of Inertial Confinement Fusion Implosions."
- X. Gong, D. N. Polsin, L. Crandall, M. Huff, B. J. Henderson, J. R. Rygg, T. R. Boehly, G. W. Collins, A. Jenei, M. G. Gorman, R. Briggs, J. H. Eggert, and M. I. McMahon, "X-Ray Diffraction of Ramp-Compressed Potassium."
- V. Gopalaswamy, R. Betti, J. P. Knauer, K. M. Woo, D. Patel, A. R. Christopherson, A. Bose, N. Luciani, F. J. Marshall, C. Stoeckl, V. Yu. Glebov, S. P. Regan, D. T. Michel, W. Seka, D. H. Edgell, R. C. Shah, D. Cao, V. N. Goncharov, J. A. Delettrez, I. V. Igumenshchev, P. B. Radha, T. J. B. Collins, T. C. Sangster, E. M. Campbell, M. Gatu Johnson, R. D. Petrasso, C. K. Li, and J. A. Frenje, "Optimization of Direct-Drive Inertial Fusion Implosions Through Predictive Statistical Modeling" (invited).
- D. Haberberger, A. Shvydsky, J. P. Knauer, S. X. Hu, V. N. Goncharov, S. T. Ivancic, and D. H. Froula, "Density Measurements of the Inner Shell Release."
- A. M. Hansen, D. Turnbull, D. Haberberger, J. Katz, D. Mastro Simone, A. Colaïtis, A. B. Sefkow, R. K. Follett, J. P. Palastro, and D. H. Froula, "Cross-Beam Energy Transfer Platform Development on OMEGA."
- R. J. Henchen, J. Katz, D. Cao, J. P. Palastro, D. H. Froula, M. Sherlock, and W. Rozmus, "Direct Measurements of Nonlocal Heat Flux by Thomson Scattering" (invited).
- B. J. Henderson, T. R. Boehly, M. Zaghoo, J. R. Rygg, D. N. Polsin, X. Gong, L. Crandall, M. Huff, M. K. Ginnane, G. W. Collins, S. Ali, and P. M. Celliers, "Broadband Reflectivity Diagnostic Development for Dynamic Compression Experiments on OMEGA EP."
- A. Howard, D. Turnbull, A. Davies, D. H. Froula, and J. P. Palastro, "Photon Acceleration in the Ionization Front of a Flying Focus."
- S. X. Hu, R. Epstein, V. N. Goncharov, and E. M. Campbell, "Direct-Drive-Ignition Designs with Gradient-Density Double Shells."
- M. Huff, J. R. Rygg, G. W. Collins, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, L. Crandall, D. E. Fratanduono, M. Millot, R. F. Smith, J. H. Eggert, P. M. Celliers, M. C. Gregor, and C. A. McCoy, "Measurements of Sound Speed in Iron Shock-Compressed to ~1 TPa."
- I. V. Igumenshchev, R. C. Shah, R. Betti, E. M. Campbell, V. N. Goncharov, J. P. Knauer, S. P. Regan, A. Shvydsky, A. L. Velikovich, and A. J. Schmitt, "Mitigating Imprint in Direct-Drive Implosions Using Rarefaction Flows."
- V. V. Karasiev, S. X. Hu, M. Zaghoo, and T. R. Boehly, "Study of the Exchange-Correlation Thermal Effects for Transport and Optical Properties of Shocked Deuterium."
- J. P. Knauer, C. Stoeckl, R. Betti, V. Gopalaswamy, K. S. Anderson, D. Cao, M. J. Bonino, E. M. Campbell, T. J. B. Collins, C. J. Forrest, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, J. A. Marozas, F. J. Marshall, P. W. McKenty, P. B. Radha, S. P. Regan, T. C. Sangster, and R. C. Shah, "Burn-Rate Measurements from the High-Performance Cryogenic Implosion Campaign on OMEGA."
- L. S. Leal, A. V. Maximov, A. B. Sefkow, R. Betti, and V. V. Ivanov, "Modeling of a Laser-Generated Plasma in MG Magnetic Fields."

O. M. Mannion, K. S. Anderson, C. J. Forrest, V. Yu. Glebov, J. P. Knauer, Z. L. Mohamed, S. P. Regan, T. C. Sangster, R. C. Shah, C. Stoeckl, and M. Gatu Johnson, "Integrated Analysis of Nuclear Measurements from the Target-Offset Campaign on OMEGA."

J. A. Marozas, G. D. Kerbel, M. M. Marinak, and S. Sepke, "Implementation of the Low-Noise, 3-D Ray-Trace Inverse-Projection Method in the Radiation-Hydrodynamics Code *HYDRA*."

F. J. Marshall, V. N. Goncharov, J. H. Kelly, T. Z. Kosc, and A. Shvydky, "*In Situ* Measurements of Direct-Drive Illumination Uniformity on OMEGA."

A. V. Maximov, J. G. Shaw, R. W. Short, and J. P. Palastro, "Saturation of Stimulated Raman Scattering in Inhomogeneous Plasma."

P. W. McKenty, T. J. B. Collins, J. A. Marozas, E. M. Campbell, K. Molvig, and M. J. Schmitt, "Numerical Investigation of Laser Imprint Mitigation in *Revolver* Ignition Designs."

A. L. Milder, P. Franke, J. Katz, J. P. Palastro, S. T. Ivancic, J. L. Shaw, A. S. Davies, I. A. Begishev, R. H. Cuffney, M. Spilatro, and D. H. Froula, "Measurement of the Langdon Effect in Laser-Produced Plasma Using Collective Thomson Scattering."

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Z. L. Mohamed, J. P. Knauer, C. J. Forrest, and M. Gatu Johnson, "Wave-Function Amplitude Analysis of the ^5He Resonance in the TT Neutron Spectrum."

P. M. Nilson, F. Ehrne, C. Mileham, D. Mastrosimone, C. Taylor, R. K. Jungquist, R. Boni, J. Hassett, C. R. Stillman, S. T. Ivancic, D. J. Lonobile, R. W. Kidder, M. J. Shoup III, A. B. Sefkow, A. A. Solodov, W. Theobald, C. Stoeckl, S. X. Hu, D. H. Froula, K. W. Hill, L. Gao, M. Bitter, P. Efthimion, I. E. Golovkin, and D. D. Meyerhofer, "High-Resolving-Power, Streaked X-Ray Spectroscopy on the OMEGA EP Laser System."

J. P. Palastro, T. M. Antonsen, Jr., L. Nguyen, A. Colaitis, R. K. Follett, D. Turnbull, J. Vieira, and D. H. Froula, "Cherenkov Radiation from a Plasma."

D. Patel, R. Betti, V. Gopalaswamy, J. P. Knauer, K. M. Woo, S. P. Regan, T. C. Sangster, C. Stoeckl, and F. J. Marshall, "A Novel Double-Spike Pulse Shape for OMEGA Cryogenic Implosions."

R. Paul, S. X. Hu, and V. V. Karasiev, "High-Pressure Phase Diagram of Silicon."

J. L. Peebles, J. R. Davies, D. H. Barnak, A. B. Sefkow, P. A. Gourdain, R. Betti, and A. V. Arefiev, "Characterizing Magnetic and Electric Fields from Laser-Driven Coils Using Axial Proton Probing."

D. N. Polsin, X. Gong, G. W. Collins, M. Huff, L. Crandall, T. R. Boehly, J. R. Rygg, A. Jenei, M. Millot, J. H. Eggert, and M. I. McMahon, "X-Ray Diffraction of Ramp-Compressed Sodium."

S. P. Regan, V. N. Goncharov, D. Cao, R. Epstein, R. Betti, M. J. Bonino, T. J. B. Collins, E. M. Campbell, C. J. Forrest, V. Yu. Glebov, D. R. Harding, J. P. Knauer, J. A. Marozas, F. J. Marshall, P. B. Radha, T. C. Sangster, R. C. Shah, C. Stoeckl, R. W. Luo, M. E. Schoff, and M. Farrell, "Dependence of Hot-Spot Mix in DT Cryogenic Implosions on the Design Adiabatic."

H. G. Rinderknecht, D. T. Casey, R. Bionta, R. Hatarik, A. Moore, E. P. Hartouni, D. Scholssberg, G. P. Grim, O. L. Landen, and P. K. Patel, "Signatures of Systematic Azimuthal Asymmetry in Nuclear Diagnosis of ICF Implosions on the NIF."

M. J. Rosenberg, A. A. Solodov, R. K. Follett, W. Seka, S. P. Regan, R. Epstein, A. R. Christopherson, R. Betti, A. V. Maximov, T. J. B. Collins, V. N. Goncharov, R. W. Short, D. Turnbull, D. H. Froula, P. B. Radha, J. F. Myatt, P. Michel, M. Hohenberger, L. Masse, G. Swadling, J. S. Ross, T. Chapman, J. D. Moody, J. W. Bates, and A. J. Schmitt, "Laser–Plasma Interaction Experiments at Direct-Drive Ignition-Relevant Scale Lengths at the National Ignition Facility."

J. J. Ruby, J. R. Rygg, C. J. Forrest, V. Yu. Glebov, D. A. Chin, G. W. Collins, B. Bachmann, J. A. Gaffney, Y. Ping, H. Sio, and N. V. Kabadi, "Measurement of Plasma Conditions at Shock Collapse on OMEGA."

R. Saha, J. Topp-Mugglestone, G. Gregori, T. White, S. P. Regan, G. W. Collins, and J. R. Rygg, "Atomic and Electronic Structure of Warm Dense Silicon."

J. L. Shaw, Z. Barfield, D. Haberberger, A. M. Hansen, J. Katz, D. Mastrosimone, D. H. Froula, F. Albert, P. M. King, N. Lemos, J. Williams, P. Fan, and Y. Lu, “Laser Wakefield Acceleration Platform for OMEGA EP.”

A. Shvydky, D. Haberberger, J. Carroll-Nellenback, D. Cao, D. H. Froula, V. N. Goncharov, S. X. Hu, I. V. Igumenshchev, J. P. Knauer, J. A. Marozas, A. V. Maximov, P. B. Radha, S. P. Regan, and T. C. Sangster, “Numerical Simulations of Shock-Release OMEGA EP Experiments.”

A. A. Solodov, M. J. Rosenberg, W. Seka, R. Epstein, R. W. Short, R. K. Follett, A. R. Christopherson, R. Betti, P. B. Radha, S. P. Regan, D. H. Froula, V. N. Goncharov, J. F. Myatt, P. Michel, M. Hohenberger, T. Chapman, J. D. Moody, J. W. Bates, and A. J. Schmitt, “Hot-Electron Generation and Preheat in Direct-Drive Experiments at the National Ignition Facility.”

C. Stoeckl, T. J. B. Collins, R. Epstein, V. N. Goncharov, R. K. Jungquist, C. Mileham, P. B. Radha, S. P. Regan, T. C. Sangster, and W. Theobald, “Investigating Small Scale Mix in Direct-Drive Cryogenic DT Implosions with Radiography on OMEGA.”

G. Tabak, M. Millot, T. R. Boehly, L. Crandall, B. J. Henderson, M. Zaghoo, S. Ali, P. M. Celliers, D. E. Fratanduono, S. Hamel, A. Lazicki, D. Swift, P. Loubeyre, R. Kodama, K. Miyanishi, T. Ogawa, N. Ozaki, T. Sano, R. Jeanloz, D. G. Hicks, G. W. Collins, J. H. Eggert, and J. R. Rygg, “Equation of State and Metallization of Methane Shock-Compressed to 400 GPa.”

W. Theobald, R. Betti, A. Bose, S. X. Hu, E. M. Campbell, S. P. Regan, C. A. McCoy, A. Casner, L. Ceurvorst, and M. Karasik, “The Hybrid Target Approach: A Promising Path Forward to Mitigate Laser Imprint in Direct Drive Inertial Confinement Fusion.”

D. Turnbull, P. Franke, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, A. Davies, D. Haberberger, J. Katz, T. J. Kessler, A. L. Milder, J. P. Palastro, J. L. Shaw, D. H. Froula, M. Edwards, Q. Jia, K. Qu, N. Fisch, N. Vafaei-Najabadi, J. Vieira, and F. Quéré, “Ionization Waves of Arbitrary Velocity.”

K. M. Woo, R. Betti, O. M. Mannion, D. Patel, V. N. Goncharov, K. S. Anderson, P. B. Radha, J. P. Knauer, V. Gopalaswamy, A. R. Christopherson, E. M. Campbell, H. Aluie, D. Shvarts, J. Sanz, and A. Bose, “Impact of Three-Dimensional Hot-Spot Flow Asymmetry on Ion-Temperature Measurements in Inertial Confinement Fusion Experiments.”

M. Zaghoo, G. W. Collins, T. R. Boehly, J. R. Rygg, V. V. Karasiev, S. X. Hu, and P. M. Celliers, “Breakdown of Fermi Degeneracy in the Simplest Liquid Metal” (invited).

H. Zhang, R. Betti, D. Zhao, H. Aluie, R. Yan, and D. Shvarts, “Self-Similar Multimode Bubble-Front Evolution of the Ablative Rayleigh–Taylor Instability in Two and Three Dimensions.”

J. L. Peebles, J. R. Davies, D. H. Barnak, R. Betti, V. Yu. Glebov, E. C. Hansen, J. P. Knauer, K. J. Peterson, and D. B. Sinars, “Scaled Neutron-Yield Enhancement Using the Laser-Driven MagLIF Platform on the OMEGA Laser,” presented at the MagLIF Meeting, Portland OR, 5–9 November 2018.

M. S. Wei, “Status of FY18 OLUG Findings and Recommendations,” presented at OLUG Meeting at APS Division of Plasma Physics, Portland OR, 6 November 2018.

The following presentations were made at Technology of Fusion Energy 2018, Orlando, FL, 11–15 November 2018:

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, “Tritium Retention in Hexavalent Chromate-Conversion-Coated Aluminum Alloy.”

J. L. Peebles, J. R. Davies, D. H. Barnak, R. Betti, V. Yu. Glebov, E. C. Hansen, J. P. Knauer, K. J. Peterson, and D. B. Sinars, “Pulsed-Power and Laser-Driven Magnetized Liner Inertial Fusion.”

M. Sharpe, C. Fagan, and W. T. Shmayda, “Distribution of Tritium in the Near Surface of 316 Stainless-Steel.”

W. T. Shmayda, C. R. Shmayda, and J. Torres, “Tritium Extraction from Water.”

T. C. Sangster, “Status of Laser-Direct-Drive Fusion in the U.S.,” presented at the Institute of Applied Physics and Computational Mathematics, Beijing, China, 29–30 November 2018.

D. H. Froula, C. Dorrer, E. M. Hill, R. K. Follett, A. A. Solodov, J. P. Palastro, D. Turnbull, D. H. Edgell, J. Bromage, T. J. Kessler, J. G. Shaw, A. M. Hansen, A. L. Milder, J. Katz, R. Boni, J. D. Zuegel, V. N. Goncharov, E. M. Campbell, P. Michel, D. Strozzi, M. Glensky, K. Peterson, J. W. Bates, A. Schmitt, J. L. Weaver, and J. F. Myatt, “Innovative Science and Broadband Lasers at LLE—A Path to an Expanded ICF Design Space,” presented at Fusion Power Associates 39th Annual Meeting and Symposium, Washington, DC, 4–5 December 2018.

The following presentations were made at the Joint U.S./Israel Workshop on High-Energy-Density Physics, Tel Aviv, Israel, 10–12 December 2018:

R. Betti, “Fusion Research at LLE: Direct Drive and Magnetized Targets.”

T. R. Boehly, “High-Energy-Density Physics Research at LLE.”

E. M. Campbell, “NIF—An Unexpected Journey, Lessons Learned to Secure “Projects of Scale” and the Future of ICF Research.”

T. C. Sangster, “Overview of the Laboratory for Laser Energetics.”

J. D. Zuegel, C. Dorrer, E. M. Hill, R. K. Follett, A. A. Solodov, J. P. Palastro, D. Turnbull, D. H. Edgell, J. Bromage, T. J. Kessler, J. G. Shaw, A. M. Hansen, A. L. Milder, J. Katz, R. Boni, V. N. Goncharov, E. M. Campbell, P. Michel, D. Strozzi, M. Glensky, K. Peterson, J. W. Bates, A. Schmitt, J. L. Weaver, and J. F. Myatt, “Laser–Plasma Instabilities and R&D Plans for Fourth-Generation ICF Lasers.”

M. Wei, “LaserNetUS Facility Readiness—Omega Laser Facility,” presented at the LaserNetUS PI Meeting, Rockville, MD, 16 January 2019.

The following presentations were made at the Japan–U.S. Symposium, Washington, DC, 23–24 January 2019:

G. W. Collins, “Forging a New Frontier of HED Science Through Japan–U.S. Collaborations.”

D. H. Froula, “Japan–U.S. Collaborations—Future Collaborations and the Direction of LLE Laser Science and Plasma Physics Research.”

E. M. Campbell, “Fusion: Making a Star on Earth and the Quest for the Ultimate Energy Source to Power the Planet,” presented at the Cornell University Seminar, Ithaca, NY, 31 January 2019.

The following presentations were made at LASE 2019, San Francisco, CA, 2–7 February 2019:

K. A. Bauer, M. Heimbueger, S. Sampat, L. J. Waxer, E. C. Cost, J. H. Kelly, V. Kobilansky, J. Kwiatkowski, S. F. B. Morse, D. Nelson, D. Weiner, G. Weselak, and J. Zou, “Comparison of On-Shot, In-Tank, and Equivalent-Target-Plane Measurements of the OMEGA Laser System Focal Spot.”

W. R. Donaldson and A. Consentino, “Co-Timing UV and IR Laser Pulses on the OMEGA EP Laser System.”

B. E. Kruschwitz, J. Kwiatkowski, C. Dorrer, M. Barczys, A. Consentino, D. H. Froula, M. J. Guardalben, E. M. Hill, D. Nelson, M. J. Shoup III, D. Turnbull, L. J. Waxer, and D. Weiner, “Tunable UV Upgrade on OMEGA EP.”

S. Sampat, T. Z. Kosc, K. A. Bauer, R. D. Dean, W. R. Donaldson, J. Kwiatkowski, R. Moshier, A. L. Rigatti, M. H. Romanofsky, L. J. Waxer, and J. H. Kelly, “Power Balancing a Multibeam Laser.”

L. J. Waxer, K. A. Bauer, E. C. Cost, M. Heimbueger, J. H. Kelly, V. Kobilansky, S. F. B. Morse, D. Nelson, R. Peck, R. Rinefield, S. Sampat, M. J. Shoup III, D. Weiner, G. Weselak, and J. Zou, “In-Tank, On-Shot Characterization of the OMEGA Laser System Focal Spot.”

The following presentations were made at Photonics West, San Francisco, CA, 2–7 February 2019:

I. A. Begishev, M. H. Romanofsky, S. Carey, R. Chapman, G. Brent, M. J. Shoup III, J. D. Zuegel, and J. Bromage, “High-Efficiency, Large-Aperture Fifth-Harmonic–Generation of

211-nm Pulses in Ammonium Dihydrogen Phosphate Crystals for Fusion Diagnostics.”

K. Kopp and S. G. Demos, “Microscopy with Ultraviolet Surface Excitation (MUSE) Enables Translation of Optical Biopsy Principles to Enhance Life Science Education.”

T. Z. Kosc, T. J. Kessler, H. Huang, R. A. Negres, and S. G. Demos, “Raman Scattering Cross-Section Measurements Using KDP Polished Crystal Spheres to Understand Transverse Stimulated Raman Scattering.”

S. P. Regan, R. Epstein, M. Bedzek, R. Betti, T. R. Boehly, M. Bonino, N. Chartier, G. W. Collins, J. A. Delettrez, D. H. Froula, V. Yu. Glebov, V. N. Goncharov, S. X. Hu, I. V. Igumenshchev, D. R. Harding, J. P. Knauer, M. Lawrie, F. J. Marshall, D. T. Michel, P. B. Radha, M. J. Rosenberg, J. R. Rygg, R. Saha, R. C. Shah, M. J. Shoup III, C. Stoeckl, T. C. Sangster, W. Theobald, E. M. Campbell, H. Sawada, R. C. Mancini, K. Falk, E. Rowe, J. Topp-Mugglestone, P. Kozlowski, G. Gregori, J. Wark, J. A. Frenje, M. Gatu Johnson, N. Kabadi, C. K. Li, H. Sio, R. D. Petrasso, P. Keiter, P. X. Belancourt, R. P. Drake, N. Woolsey, I. E. Golovkin, J. J. MacFarlane, S. H. Glenzer, B. A. Hammel, L. J. Suter, S. Ayers, M. A. Barrios, P. M. Bell, D. K. Bradley, M. J. Edwards, K. B. Fournier, S. W. Haan, O. A. Hurricane, C. A. Iglesias, N. Izumi, O. L. Landen, D. Larson, A. Nikroo, M. Schneider, H. A. Scott, T. Ma, P. K. Patel, D. Thorn, B. G. Wilson, D. A. Haynes, D. D. Meyerhofer, H. Huang, J. Jaquez, J. D. Kilkenny, L. Gao, K. Hill, B. Kraus, P. Efthimion, Y. Lu, X. Huang, and P. Fan, “X-Ray Spectroscopy and Inertial Confinement Fusion,” presented at the University of Nebraska, Lincoln, NE, 13 February 2019.

E. M. Campbell, “Fusion: Making a Star on Earth and the Quest for the Ultimate Energy Source to Power the Planet,” presented at SUNY Geneseo Seminar, Geneseo, NY, 14 February 2019.

E. M. Campbell, “Fusion: Making a Star on Earth and the Quest for the Ultimate Energy Source to Power the Planet,” presented at the ASME Student Banquet, Rochester, NY, 15 February 2019.

M. S. Wei, “LaserNetUS-OMEGA EP Laser System and Experimental Capability,” presented at LaserNetUS, Virtual Meeting, 15 February 2019.

The following presentations were made at the 59th Sanibel Symposium, St. Simons Island GA, 17–22 February 2019:

J. Hinz, V. V. Karasiev, S. X. Hu, M. Zaghoo, and D. Mejia-Rodriguez, “Deorbitalized Meta-GGA with the Long-Range van der Waals Exchange-Correlation Functional Calculations of the Insulator–Metal Transition of Hydrogen.”

V. V. Karasiev, S. X. Hu, M. Zaghoo, T. R. Boehly, S. B. Trickey, and J. W. Dufty, “Exchange–Correlation Thermal Effects: Softening the Deuterium Hugoniot and Thermophysical Properties.”

R. Paul, V. V. Karasiev, and S. X. Hu, “High-Pressure Phases and Spectral Properties of Silicon.”

J. L. Peebles, J. R. Davies, R. Moshier, M. Bradley, T. Nguyen, G. Weselak, G. Fiksel, R. Shapovalov, R. Spielman, G. Brent, D. W. Jacobs-Perkins, A. Bose, M. Gatu Johnson, C. K. Li, J. A. Frenje, R. D. Petrasso, and R. Betti, “Magnetizing 60-Beam Spherical Implosions on OMEGA,” presented at the 2019 Stewardship Science Academic Programs Symposium, Albuquerque, NM, 19–20 February 2019.

E. M. Campbell, “LLE Priorities FY2020–FY2021,” presented at the ICF Executives Meeting, Albuquerque, NM, 21–22 February 2019.

G. W. Collins, “Extreme Matters: A Laboratory Exploration of Planets, Stars, and Quantum Matter,” presented at the Phelps Colloquium, Rochester, NY, 27 February 2019.

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, X. Gong, L. Crandall, R. Saha, J. J. Ruby, G. Tabak, M. F. Huff, Z. K. Sprowal, D. A. Chin, M. K. Ginnane, P. M. Celliers, J. H. Eggert, A. Lazicki, R. F. Smith, R. Hemley,

F. Coppari, B. Bachmann, J. Gaffney, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, D. G. Braun, S. Hamel, M. Millot, M. Gorman, R. Briggs, S. Ali, R. Kraus, P. Loubeyre, S. Brygoo, R. Jeanloz, R. Falcone, M. McMahon, F. N. Beg, C. Bolme, A. Gleason, S. Glenzer, H. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, “Laser Focus on Planets: Exploring Planets and Stars Through High Energy Density Science,” presented at the APS March Meeting, Boston, MA, 4–8 March 2019.

The following presentations were made at Matter in Extreme Conditions from Material Science to Planetary Physics, Montgenevre, France, 17–23 March 2019:

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, X. Gong, L. E. Crandall, R. Saha, J. J. Ruby, G. Tabak, M. F. Huff, Z. K. Sprowal, D. A. Chin, M. K. Ginnane, P. M. Celliers, J. H. Eggert, A. Lazicki, R. F. Smith, R. Hemley, F. Coppari, B. Bachman, J. Gaffney, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, D. G. Braun, S. Hamel, M. Millot, M. Gorman, R. Briggs, S. Ali, R. Kraus, P. Loubeyre, S. Brygoo, R. Jeanloz, R. Falcone, M. McMahon, F. N. Beg, C. Bolme, A. Gleason, S. H. Glenzer, H. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, “Shock Physicists: Today’s Explorers of the Universe.”

B. J. Henderson, M. Zaghoo, X. Gong, D. N. Polsin, J. R. Rygg, T. R. Boehly, G. W. Collins, S. Ali, P. M. Celliers, A. E. Lazicki, M. Gorman, M. Millot, J. H. Eggert, and M. McMahon, “Broadband Reflectivity Diagnostic Development for Dynamic Compression Experiments on OMEGA EP.”

J. R. Rygg, D. N. Polsin, X. Gong, T. R. Boehly, G. W. Collins, S. P. Regan, C. Sorce, J. H. Eggert, R. Smith, A. Lazicki, M. Ahmed, A. Arsenlis, M. A. Barrios, J. Bernier, K. Blobaum, D. G. Braun, R. Briggs, P. M. Celliers, A. Cook, F. Coppari, D. E. Fratanduono, M. Gorman, B. Heidl, M. Hohenberger, D. H. Kalantar, S. Khan, R. Kraus, J. McNaney, D. Swift, J. Ward, C. Wehrenberg, A. Higginbotham, M. Suggit, J. Wark, J. Wang, T. Duffy, J. Wicks, and M. McMahon, “X-Ray Diffraction in the Terapascal Regime.”

W. T. Shmayda, C. Fagan, and R. C. Shmayda, “Reducing Releases from Tritium Facilities,” presented at the First Tritium School, Ljubljana, Slovenia, 25–28 March 2019.

The following presentations were made at the International Conference on High Energy Density Science, Oxford, UK, 31 March–5 April 2019:

R. Betti, “Recent Advances in Direct-Drive Laser Fusion.”

S. X. Hu, Y. H. Ding, V. V. Karasiev, R. Paul, M. Ghosh, J. Hinz, P. M. Nilson, T. R. Boehly, P. B. Radha, V. N. Goncharov, S. Skupsky, J. R. Rygg, G. W. Collins, S. P. Regan, E. M. Campbell, L. A. Collins, J. D. Kress, A. J. White, O. Certik, and B. Militzer, “Warming Up Density Functional Theory (DFT) for High-Energy-Density Plasmas.”

D. N. Polsin, X. Gong, M. F. Huff, L. E. Crandall, G. W. Collins, T. R. Boehly, J. R. Rygg, A. Lazicki, M. Millot, P. M. Celliers, J. H. Eggert, and M. I. McMahon, “High-Pressure Structural and Electronic Properties of Ramp-Compressed Sodium.”

J. Bromage, A. Agliata, S.-W. Bahk, M. Bedzyk, I. A. Begishev, W. A. Bittle, T. Buczek, J. Bunkenburg, D. Canning, A. Consentino, D. Coppenbarger, R. Cuffney, C. Dorrer, C. Feng, D. H. Froula, G. Gates, M. J. Guardalben, D. Haberberger, S. Hadrich, C. Hall, B. N. Hoffman, R. K. Jungquist, T. J. Kessler, E. Kowaluk, B. E. Kruschwitz, T. Lewis, J. Magoon, D. D. Meyerhofer, C. Mileham, M. Millecchia, S. F. B. Morse, P. M. Nilson, J. B. Oliver, R. G. Peck, A. L. Rigatti, H. Rinderknecht, R. G. Roides, M. H. Romanofsky, J. Rothhardt, E. M. Schiesser, K. Shaughnessy, M. J. Shoup III, C. Smith, M. Spilatro, C. Stoeckl, R. Taylor, B. Wager, L. J. Waxer, B. Webb, D. Weiner, and J. D. Zuegel, “Laser Technology Development for Ultra-Intense Optical Parametric Chirped-Pulse Amplification,” presented at Optics and Optoelectronics 2019, Prague, Czech Republic, 1–4 April 2019.

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, X. Gong, L. Crandall, R. Saha, J. J. Ruby, G. Tabak, M. Huff, Z. K. Sprowal, D. A. Chin, M. K. Ginnane, P. M. Celliers, J. H. Eggert, A. Lazicki, R. F. Smith, R. Hemley, F. Coppari, B. Bachmann, J. Gaffney, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, D. G. Braun, S. Hamel, M. Millot, M. Gorman, R. Briggs, S. Ali, R. Kraus, M. McMahon, P. Loubeyre, S. Brygoo, R. Jeanloz, R. Falcone, F. N. Beg, C. Bolme, A. Gleason, S. H. Glenzer, H. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, “Extreme Matters: Pressure to Explore New Worlds and Exotic Solids,”

presented at the 2019 Mach Conference, Annapolis, MD, 3–5 April 2019.

The following presentations were made at CEIS 2019, Rochester, NY, 4 April 2019:

W. R. Donaldson and Y. Zhao, “Picosecond UV Photodiodes.”

A. Stenson, G. Chen, Y. Akbas, I. Komissarov, R. Sobolewski, A. Jafari-Salim, and O. Mukhanov, “Superconducting Single-Photon Detectors as Smart Sensors.”

E. M. Campbell, “Laser-Direct-Drive Status and Future Plans,” presented at MIT, Cambridge, MA, 5 April 2019.

The following presentations were made at the 15th Direct-Drive and Fast-Ignition Workshop, Rome, Italy, 8–10 April 2019:

R. Betti, V. Gopalaswamy, J. P. Knauer, N. Luciani, D. Patel, K. M. Woo, A. Bose, I. V. Igumenshchev, E. M. Campbell, K. S. Anderson, K. A. Bauer, M. J. Bonino, D. Cao, A. R. Christopherson, G. W. Collins, T. J. B. Collins, J. R. Davies, J. A. Delettrez, D. H. Edgell, R. Epstein, C. J. Forrest, D. H. Froula, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, S. X. Hu, D. W. Jacobs-Perkins, R. T. Janezic, J. H. Kelly, O. M. Mannion, A. V. Maximov, F. J. Marshall, D. T. Michel, S. Miller, S. F. B. Morse, J. P. Palastro, J. L. Peebles, P. B. Radha, S. P. Regan, S. Sampat, T. C. Sangster, A. B. Sefkow, W. Seka, R. C. Shah, W. T. Shmayda, A. Shvydky, C. Stoeckl, A. A. Solodov, W. Theobald, and J. D. Zuegel, “Progress Toward Demonstrating Hydro-Equivalent Ignition with Direct-Drive Inertial Confinement Fusion.”

V. N. Goncharov, “Acoustic Trapping and Perturbation Amplification in Nested Rarefaction Waves.”

J. P. Palastro, R. K. Follett, D. Turnbull, C. Dorrer, E. M. Hill, L. Nguyen, A. S. Davies, A. M. Hansen, R. J. Henchen, A. Milder, A. A. Solodov, A. Shvydky, J. Bromage, V. N. Goncharov, D. H. Froula, J. Bates, J. L. Weaver, S. Obenschain, and A. Colaïtis, “Expanding the Inertial Confinement Fusion Design Space with Broadband Mitigation of Laser-Plasma Instabilities.”

S. P. Regan, V. N. Goncharov, T. C. Sangster, R. Betti, E. M. Campbell, K. A. Bauer, T. R. Boehly, M. J. Bonino, D. Cao, A. R. Christopherson, G. W. Collins, T. J. B. Collins, R. S. Craxton, D. H. Edgell, R. Epstein, C. J. Forrest, R. K. Follett, J. A. Frenje, D. H. Froula, V. Yu. Glebov, V. Gopalaswamy, D. R. Harding, S. X. Hu, I. V. Igumenshchev, S. T. Ivancic, D. W. Jacobs-Perkins, R. T. Janezic, J. H. Kelly, M. Karasik, T. J. Kessler, J. P. Knauer, T. Z. Kosc, O. M. Mannion, J. A. Marozas, F. J. Marshall, P. W. McKenty, Z. Mohamed, S. F. B. Morse, P. M. Nilson, J. P. Palastro, R. D. Petrasso, D. Patel, J. L. Peebles, P. B. Radha, H. G. Rinderknecht, M. J. Rosenberg, S. Sampat, W. Seka, R. C. Shah, J. R. Rygg, J. G. Shaw, W. T. Shmayda, M. J. Shoup III, A. Shvydky, A. A. Solodov, C. Sorce, C. Stoeckl, W. Theobald, D. Turnbull, J. Ulreich, M. D. Wittman, K. M. Woo, J. D. Zuegel, J. A. Frenje, M. Gatu Johnson, R. D. Petrasso, M. Karasik, S. P. Obenschain, and A. J. Schmitt, “Multidimensional Effects on Hot-Spot Formation in OMEGA DT Cryogenic Implosions.”

E. M. Campbell, “Fusion: Making a Star on Earth and the Quest for the Ultimate Energy Source to Power the Planet,” presented at Torch Club, Rochester, NY, 9 April 2019.

E. M. Campbell, “Laser-Direct-Drive Status and Future Plans,” presented at Washington State University, Pullman, WA, 11 April 2019.

The following presentations were made at the APS April Meeting 2019, Denver, CO, 13–16 April 2019:

C. J. Forrest, J. P. Knauer, E. M. Campbell, G. W. Collins, V. Yu. Glebov, O. M. Mannion, Z. Mohamed, P. B. Radha, S. P. Regan, T. C. Sangster, C. Stoeckl, A. Deltuva, and W. U. Schröder, “Neutron-Induced Breakup of Deuterium at 14 MeV.”

A. Schwemmlin, W. U. Schröder, C. Stoeckl, C. J. Forrest, V. Yu. Glebov, S. P. Regan, T. C. Sangster, W. Theobald, “Using the OMEGA EP Laser for Nuclear Experiments at LLE.”

G. W. Collins, “Extreme Matters: Pressure to Explore New Worlds and Exotic Solids,” presented at the Materials Science and Engineering Colloquium, New York, NY, 19 April 2019.

The following presentations were made at the 12th International Conference on Tritium Science and Technology, Busan, Korea, 22–26 April 2019:

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, “Thin-Alumina Film as a Tritium Adsorption Inhibitor for Stainless-Steel 316.”

M. D. Sharpe, K. Glance, and W. T. Shmayda, “Measurement of Palladium Hydride and Palladium Deuteride Isotherms Between 130 and 393 K.”

W. T. Shmayda, M. D. Sharpe, C. Fagan, M. D. Wittman, R. F. Earley, and N. P. Redden, “Tritium Activities at the University of Rochester’s Laboratory for Laser Energetics.”

The following presentations were made at the Target Fabrication Meeting 2019, Annapolis, MD, 23–26 April 2019:

M. J. Bonino, D. R. Harding, W. Sweet, M. Schoff, A. Greenwood, N. Satoh, M. Takagi, and A. Nikroo, “Properties of Vapor-Deposited and Solution-Processed Targets for Laser-Driven Inertial Confinement Fusion Experiments.”

T. Cracium, M. J. Bonino, L. Crandall, B. J. Henderson, J. J. Ruby, J. R. Rygg, J. L. Peebles, M. Huff, X. Gong, D. N. Polsin, D. A. Chin, and M. K. Ginnane, “High-Energy-Density Target Production at LLE.”

A. Lighty and D. R. Harding, “Using a Liquid–Liquid Extraction Technique to Reduce the Number and Size of Vacuoles in Polystyrene Films.”

J. L. Shaw, D. Wasilewski, D. R. Harding, Z. Barfield, D. Haberberger, A. M. Hansen, J. Katz, D. Mastro Simone, D. H. Froula, P. Fan, Y. Lu, J. Campbell, J. P. Sauppe, and K. A. Flippo, “Targets for Underdense Plasma Studies at the Laboratory for Laser Energetics.”

D. W. Turner, M. J. Bonino, T. Cracium, J. L. Peebles, J. Streit, and J. Hund, “Manufacture of Targets for Magnetized Liner Inertial Fusion Campaigns on the OMEGA-60 Laser System.”

D. Wasilewski, D. R. Harding, J. L. Shaw, Y. Lu, P. Fan, and J. Campbell, “Methods for Removing Fragile Printed-Foam Structures from Their Substrates.”

M. D. Wittman, D. R. Harding, N. P. Redden, J. Ulreich, R. Chapman, and L. Carlson, “Progress on Filling and Layering DT-Filled Fill-Tube Capsules for OMEGA Experiments.”

S.-W. Bahk, “Programmable Beam-Shaping System for High Power Laser Systems,” presented at the RIT Center for Imaging Science Seminar, Rochester, NY, 24 April 2019.

The following presentations were made at the Omega Laser Facility Users Group Workshop, Rochester, NY, 24–26 April 2019:

M. Barczys, R. Brown, D. Canning, A. Consentino, D. Coppenbarger, M. J. Guardalben, E. M. Hill, T. Z. Kosc, B. E. Kruschwitz, R. Russo, M. Spilatro, A. Szydlowski, and L. J. Waxer, “Advancements in Pulse Shaping on OMEGA EP.”

K. A. Bauer, L. J. Waxer, M. Heimbueger, J. H. Kelly, J. Kwiatkowski, S. F. B. Morse, D. Nelson, S. Sampat, and D. Weiner, “Comparison of On-Shot, In-Tank, and Equivalent-Target-Plane Measurements of the OMEGA Laser System Focal Spot.”

J. Bromage, “Capabilities and Future Prospects for the Multi-Terawatt (MTW) Laser Facility at LLE.”

K. M. Glance, W. T. Shmayda, and M. D. Sharpe, “Using Palladium Hydride to Fill Inertial Confinement Fusion Targets.”

Z. L. Mohamed, J. P. Knauer, C. J. Forrest, and M. Gatu Johnson, “Wave-Function Amplitude Analysis of the ^5He Resonance in the TT Neutron Spectrum.”

S. F. B. Morse, “Omega Facility OLUG 2019 Update: Progress on Recommendations and Items of General Interest.”

H. G. Rinderknecht, “Summary of the EP OPAL Workshop.”

A. Sharma and R. S. Craxton, “Optimization of Cone-In-Shell Targets for an X-Ray Backlighter at the National Ignition Facility.”

A. Sorce, J. Kendrick, D. Weiner, T. R. Boehly, J. R. Rygg, M. K. Ginnane, J. Zou, A. Liu, and M. Couch, “Recent Upgrades to the Omega Laser Facility’s VISAR and SOP Diagnostics.”

C. Sorce, “Gas-Jet System on OMEGA and OMEGA EP.”

M. Zaghoo, “Capabilities and Techniques for Diamond Anvil Cells.”

A. J. Howard, D. Turnbull, A. S. Davies, P. Franke, D. H. Froula, and J. P. Palastro, “Photon Acceleration in a Flying Focus,” presented at Design Day, Rochester, NY, 2 May 2019.

H. G. Rinderknecht, “Frontiers in Ultrahigh Intensity and Relativistic Physics Enabled by an Optical Parametric Amplifier Laser (EP OPAL) Facility,” presented at Plasma Physics Town Hall Meeting, Rochester, NY, 16 May 2019.

V. V. Karasiev and S. X. Hu, “Development of Finite-T Exchange-Correlation Functionals: Improving Reliability for WDM Applications,” presented at the 10th International Workshop on Warm Dense Matter, Travemünde, Germany, 5–9 May 2019 (invited).

R. Epstein, “Laser Fusion at the University of Rochester’s Laboratory for Laser Energetics,” presented at Science Exploration Day, Rochester, NY, 17 May 2019.

The following presentations were made at CLEO 2019, San Jose, CA, 5–10 May 2019:

S. Bucht, D. Haberberger, J. Bromage, and D. H. Froula, “Designing Grism Stretchers for Idler-Based Optical Parametric Chirped-Pulse-Amplification Systems.”

M. S. Wei, “National Laser Users’ Facility and Basic Science Programs at the Omega Laser Facility,” presented at Workshop on Opportunities, Challenges, and Best Practices for Basic Plasma Science User Facilities, College Park, MD, 20–21 May 2019.

Y. Zhao and W. R. Donaldson, “Ultrafast AlGaN UV Photodetectors with Picoseconds Response.”

The following presentations were made at CEA–NNSA Joint Diagnostic Meeting, Washington, DC, 21–22 May 2019:

J. L. Shaw, J. P. Palastro, D. Turnbull, T. J. Kessler, A. Davies, P. Franke, A. Howard, L. Nguyen, D. Ramsey, G. W. Jenkins, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, R. K. Follett, D. Haberberger, J. Katz, F. A. Hegmann, D. Purshchke, N. Vafaei-Najafabadi, J. Vieira, and F. Quere, “Flying Focus and Its Application to Laser-Plasma Accelerators,” presented at the Laser-Plasma Accelerator Workshop, Split, Croatia, 5–10 May 2019 (invited).

R. Boni, “Update on Streak Tube Simulations.”

S. T. Ivancic, W. Theobald, C. Sorce, M. Bedzyck, F. J. Marshall, C. Stoeckl, R. C. Shah, M. Lawrie, S. P. Regan, T. C. Sangster, E. M. Campbell, T. J. Hilsabeck, K. Englehorn, J. D. Kilkenny, T. M. Chung, J. D. Hares, A. K. L. Dymoke-Bradshaw, P. Bell, J. Celeste, A. C. Carpenter, M. Dayton, D. K. Bradley, M. C. Jackson, E. Hurd, L. Pickworth, S. R. Nagel, G. Rochau, J. Porter, M. Sanchez, L. Claus, G. Robertson, and Q. Looker, “The Single Line-of-Sight Time-Resolved X-Ray Imager on OMEGA.”

S. P. Regan, “Neutron Imaging Systems on OMEGA.”

The following presentations were made at the UBUR Superconductivity Workshop, Buffalo, 10 May 2019:

W. R. Donaldson, “Measuring Optically Activated Transient Superconductivity Events at LLE.”

The following presentations were made at the Laser Imprint Workshop, Rochester, NY, 22–24 May 2019:

J. R. Rygg, “Tutorial: High Pressure Physics.”

T. J. B. Collins, C. Stoeckl, R. Epstein, S. Miller, O. M. Mannion, R. Betti, J. A. Delettrez, W. A. Bittle, C. J. Forrest,

V. Yu. Glebov, V. N. Goncharov, D. R. Harding, I. V. Igumenshchev, D. W. Jacobs-Perkins, R. J. Janezic, J. H. Kelly, T. Z. Kosc, C. Mileham, D. T. Michel, R. L. McCrory, P. W. McKenty, F. J. Marshall, S. F. B. Morse, P. B. Radha, S. P. Regan, B. Rice, T. C. Sangster, M. J. Shoup III, W. T. Shmayda, C. Sorce, W. Theobald, J. Ulreich, M. D. Wittman, J. A. Frenje, M. Gatu Johnson, and R. D. Petrasso, "Mixing at the Fuel-Ablator Interface in Backlit OMEGA Cryogenic Implosions."

C. Dorrer, "The FLUX Project."

S. X. Hu, J. L. Peebles, W. Theobald, S. P. Regan, P. B. Radha, A. Shvydky, V. N. Goncharov, M. Karasik, J. Oh, A. Velikovich, S. Obenschain, A. Casner, G. Duchateau, B. Chimier, H. Huang, M. Farrell, A. Nikroo, M. Hohenberger, V. A. Smalyuk, M. J. Bonino, D. R. Harding, T. R. Boehly, D. T. Michel, T. J. Kessler, J. P. Knauer, R. Epstein, I. V. Igumenshchev, M. J. Rosenberg, V. T. Tikhonchuk, A. Kar, C. Cao, C. Stoeckl, T. J. B. Collins, J. A. Marozas, K. S. Anderson, T. C. Sangster, R. Betti, D. H. Froula, J. P. Palastro, D. Turnbull, F. J. Marshall, M. Wei, T. Mehlhorn, and E. M. Campbell, "Review of Imprint Effects on Direct-Drive Inertial Confinement Fusion."

J. P. Knauer, "The Effect of Imprint on OMEGA Cryogenic Target Implosions."

J. L. Peebles, "OHRV Measurements in Direct-Drive Experiments."

A. Shvydky, P. B. Radha, M. J. Rosenberg, K. S. Anderson, V. N. Goncharov, J. A. Marozas, F. J. Marshall, P. W. McKenty, S. P. Regan, T. C. Sangster, M. Hohenberger, J. M. Di Nicola, J. M. Koning, M. M. Marinak, L. Masse, and M. Karasik, "Hydrodynamic Instability Growth and Imprint Experiments at the National Ignition Facility."

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G. Chen, R. Adam, D. E. Burgler, I. Komissarov, S. Heidtfeld, H. Hardtdegen, M. Mikulics, C. M. Schneider, and R. Sobolewski, "Ultrabroadband THz Radiation Transients Emitted from Ta/NiFe/Pt Nanolayers upon Excitation by Femtosecond Laser Pulses," presented at Frontiers in Materials Science for the 21st Century Symposium, Rochester, NY, 23 May 2019.
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C. Thomas, "Laser-Direct-Drive Status and Future Plans," presented at the 28th IEEE Symposium on Fusion Engineering, Ponte Vedra Beach, FL, 2–6 June 2019.

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The following presentations were made at Optical Interference Coatings, Santa Ana Pueblo, NM, 2–7 June 2019:

S. MacNally, C. Smith, J. Spaulding, J. Foster, and J. B. Oliver, "Glancing-Angle-Deposited Silica Films for Ultraviolet Wave Plates."

J. B. Oliver, "Precision Coatings for Large Optics."

J. B. Oliver, A. L. Rigatti, T. Noll, J. Spaulding, J. Hettrick, V. Gruschow, G. Mitchell, D. Sadowski, C. Smith, and B. Charles, "Large-Aperture Coatings for Fusion-Class Laser Systems."

J. B. Oliver, J. Spaulding, and B. Charles, "Stress Compensation by Deposition of a Nonuniform Corrective Coating."

C. Smith, S. MacNally, and J. B. Oliver, "Ellipsometric Modeling of Serially Bi-Deposited Glancing-Angle-Deposition Coatings."

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The following presentations were made at the 49th Anomalous Absorption Conference, Telluride, CO, 9–14 June 2019:

D. H. Edgell, R. Bahr, J. Katz, and D. H. Froula, "Anomalous Asymmetry of Unabsorbed Light in OMEGA Implosions."

R. K. Follett, J. G. Shaw, D. H. Edgell, D. H. Froula, C. Dorrer, J. Bromage, E. M. Hill, T. J. Kessler, A. V. Maximov, A. A. Solodov, E. M. Campbell, J. P. Palastro, J. F. Myatt, J. W. Bates, and J. L. Weaver, "Mitigation of Laser-Plasma Instabilities Using Bandwidth," (invited).

P. Franke, D. Turnbull, J. P. Palastro, J. Katz, I. A. Begishev, R. Boni, J. Bromage, J. L. Shaw, A. Howard, A. L. Milder, A. Davies, S. Bucht, D. Haberberger, A. M. Hansen, and D. H. Froula, "Measurement and Control of Ionization Waves of Arbitrary Velocity" (invited).

A. M. Hansen, D. Turnbull, J. Katz, A. L. Milder, J. P. Palastro, D. Mastro Simone, and D. H. Froula, “Phase Plates in Thomson-Scattering Experiments.”

A. Howard, D. Turnbull, A. S. Davies, P. Franke, D. H. Froula, and J. P. Palastro, “Photon Acceleration in a Flying Focus.”

A. Kar, S. X. Hu, P. B. Radha, and G. Duchateau, “A Micro-physics Model to Understand the Solid-to-Plasma Transition of Dielectric Ablator Materials for Direct-Drive Implosions.”

A. V. Maximov, J. G. Shaw, and J. P. Palastro, “Modeling Stimulated Raman Scattering and Cross-Beam Energy Transfer in Direct-Drive National Ignition Facility Plasmas.”

A. L. Milder, R. Boni, J. Katz, P. Franke, S. T. Ivancic, J. L. Shaw, J. P. Palastro, A. Davies, A. M. Hansen, D. Turnbull, I. A. Begishev, D. H. Froula, M. Sherlock, H. Le, and W. Rozmus, “Measuring Electron Distribution Functions Driven by Inverse Bremsstrahlung Heating with Collective Thomson Scattering” (invited).

J. P. Palastro, T. M. Antonsen Jr., L. Nguyen, A. Howard, D. W. Ramsey, T. T. Simpson, R. K. Follett, D. Turnbull, J. Vieira, and D. H. Froula, “Cherenkov Radiation from a Plasma.”

H. G. Rinderknecht, H. S. Park, J. S. Ross, P. A. Amendt, D. P. Higginson, S. C. Wilks, R. K. Follett, D. Haberberger, J. Katz, D. H. Froula, N. M. Hoffman, G. Kagan, B. Keenan, A. Simakov, L. Chacon, and E. Vold, “Ion-Velocity Structure in Strong Collisional Plasma Shocks” (invited).

M. J. Rosenberg, A. A. Solodov, W. Seka, R. K. Follett, S. P. Regan, C. Ren, R. Epstein, A. R. Christopherson, R. Betti, A. V. Maximov, T. J. B. Collins, V. N. Goncharov, R. W. Short, D. H. Froula, P. B. Radha, J. F. Myatt, P. Michel, M. Hohenberger, L. Masse, G. Swadling, J. S. Ross, T. Chapman, J. D. Moody, J. W. Bates, and A. J. Schmitt, “Planar Laser–Plasma Interaction Experiments at Direct-Drive Ignition-Relevant Scale Lengths at the National Ignition Facility.”

A. Ruocco, A. V. Maximov, J. P. Palastro, R. K. Follett, W. Theobald, A. Casner, D. Batani, J. Trela, A. Colaïtis, G. Duchateau, and V. T. Tikhonchuk, “Modeling of Laser–Plasma Interaction in the Shock-Ignition Regime with *LPSE*: Comparison with Particle-in-Cell Simulations and Experiments.”

A. A. Solodov, M. J. Rosenberg, A. R. Christopherson, R. Betti, M. Stoeckl, W. Seka, R. Epstein, R. K. Follett, P. B. Radha, S. P. Regan, D. H. Froula, V. N. Goncharov, J. F. Myatt, M. Hohenberger, B. Bachmann, and P. Michel, “Hot-Electron Preheat and Energy Deposition in Direct-Drive Implosion Experiments at the National Ignition Facility.”

D. Turnbull, C. Dorrer, D. Edgell, R. K. Follett, D. H. Froula, A. M. Hansen, J. Katz, B. Kruschwitz, A. L. Milder, J. P. Palastro, A. Colaïtis, T. Chapman, L. Divol, C. Goyon, G. E. Kemp, D. Mariscal, P. Michel, J. D. Moody, B. B. Pollock, J. S. Ross, D. J. Strozzi, E. R. Tubman, and N. C. Woolsey, “Crossed-Beam Energy Transfer Model Validation for Increased Confidence in Proposed Laser Upgrades and Implosion Scaling.”

C. J. Forrest, V. Yu. Glebov, J. P. Knauer, P. B. Radha, J. R. Rygg, U. Schroeder, O. M. Mannion, Z. L. Mohamed, S. P. Regan, T. C. Sangster, A. Schwemmlin, C. Stoeckl, J. A. Frenje, M. Gatu Johnson, F. H. Seguin, R. D. Petrasso, D. T. Casey, C. Cerjan, D. Dearborn, M. J. Edwards, R. Hatarik, O. S. Jones, O. L. Landen, A. J. Mackinnon, S. Quaglioni, S. Sepke, P. Springer, I. Thomson, R. E. Tipton, A. B. Zylstra, G. Grim, C. Brune, A. Voinov, J. D. Kilkenny, B. Appelbe, A. Crilly, G. Hale, H. W. Herrmann, Y. H. Kim, M. Paris, W. Martin, and B. Augierre, “Nuclear Science at the University of Rochester’s Omega Laser Facility,” presented at Texas A & M University, College Station, TX, 13 June 2019.

The following presentations were made at the 21st Biennial Conference of the APS Topical Group on Shock Compression of Condensed Matter, Portland OR, 16–21 June 2019:

D. A. Chin, P. M. Nilson, J. J. Ruby, X. Gong, D. N. Polsin, T. R. Boehly, D. Mastro Simone, D. Guy, J. R. Rygg, G. W. Collins, I. Szumila, J. Buettner, D. Trail, M. Harmand, Y. Ping, F. Coppari, U. Feldman, and J. Seely, “An Extended X-Ray Absorption Fine Structure Spectroscopy Study of Iron Oxides.”

L. Crandall, G. Tabak, Z. K. Sprowal, D. N. Polsin, J. R. Rygg, G. W. Collins, D. E. Fratanduono, R. F. Smith, and J. H. Eggert, “Dynamic Precompression: Secondary Hugoniot of MgO.”

M. Ghosh and S. X. Hu, “Diamond Formation from Hydrocarbons in Planetary Conditions: An *ab initio* Study.”

M. K. Ginnane, D. N. Polsin, X. Gong, T. R. Boehly, J. R. Rygg, G. W. Collins, A. Lazicki, R. Kraus, J. H. Eggert, M. Marshall, D. E. Fratanduono, J. P. Davis, C. A. McCoy, and C. Seagle, “X-Ray Diffraction of Shock-Ramped and Shock-Released Platinum.”

X. Gong, D. N. Polsin, R. Paul, R. Saha, J. R. Rygg, and G. W. Collins, “Structure and Optical Properties of Ramp Compressed Silicon Up to 550 GPa.”

B. J. Henderson, T. R. Boehly, M. Zaghoo, J. R. Rygg, D. N. Polsin, X. Gong, L. Crandall, M. F. Huff, M. K. Ginnane, G. W. Collins, S. Ali, P. M. Celliers, R. Briggs, M. Gorman, M. Marshall, and J. H. Eggert, “A Broadband Reflectance Diagnostic for Matter at Extreme Conditions.”

M. Huff, J. R. Rygg, G. W. Collins, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, L. Crandall, D. E. Fratanduono, M. Millot, R. F. Smith, J. H. Eggert, P. M. Celliers, M. C. Gregor, and C. A. McCoy, “Sound Velocity in Shocked Iron and Beryllium to ~1500 GPa.”

D. N. Polsin, X. Gong, M. F. Huff, L. E. Crandall, G. W. Collins, T. R. Boehly, J. R. Rygg, A. Lazicki, M. Millot, P. M. Celliers, J. H. Eggert, and M. I. McMahon, “High-Pressure Structural and Electronic Properties of Ramp-Compressed Sodium.”

J. J. Ruby, J. R. Rygg, C. J. Forrest, V. Yu. Glebov, D. A. Chin, G. W. Collins, B. Bachmann, J. A. Gaffney, Y. Ping, H. Sio, and N. V. Kabadi, “Measurement of Spherically Converging Shock Waves on OMEGA.”

J. R. Rygg, A. B. Zylstra, P. Grabowski, M. Millot, M. Gatu Johnson, B. Lahmann, R. D. Petrasso, F. H. Seguin, H. Sio, Y. H. Ding, and S. X. Hu, “Precision Measurements of Stopping Power in Shock-Compressed Carbon.”

R. Saha, J. Topp-Mugglestone, G. Gregori, T. R. Boehly, G. W. Collins, S. P. Regan, T. G. White, and J. R. Rygg, “Atomic and Electronic Structure of Warm Dense Silicon.”

Z. K. Sprowal, D. N. Polsin, T. R. Boehly, D. G. Hicks, J. R. Rygg, G. W. Collins, and M. F. Huff, “Double Shock in Polystyrene.”

G. Tabak, M. A. Millot, S. Hamel, T. Ogawa, P. M. Celliers, D. E. Fratanduono, A. Lazicki, D. C. Swift, S. Brygoo, P. Loubeyre, T. R. Boehly, L. Crandall, B. J. Henderson, M. Zaghoo, S. Ali, R. Kodama, K. Miyanishi, N. Ozaki, T. Sano, R. Jeanloz, D. G. Hicks, G. W. Collins, J. H. Eggert, and J. R. Rygg, “Equation of State and Metallization of Methane Shock-Compressed to 400 GPa.”

The following presentations were made at the 12th International Laser Operations Workshop 2019, Aldermaston, UK, 17–20 June 2019:

K. A. Bauer, M. Heimbueger, S. Sampat, L. J. Waxer, E. C. Cost, J. H. Kelly, V. Kobilansky, J. Kwiatkowski, S. F. B. Morse, D. Nelson, D. Weiner, G. Weselak, and J. Zou, “On-Shot, In-Tank Measurements of the OMEGA Laser System Focal Spot.”

D. Canning, “Formalized Incident Investigation, Reporting, and Recurrence Mitigation.”

S. Householder, G. Brent, J. Coon, M. Labuzeta, M. Barczys, J. H. Kelly, B. Kruschwitz, T. Smith, and S. F. B. Morse, “Improvements to Omega Disk Amplifier Performance Through Analysis of High-Resolution Flash-Lamp Waveforms.”

J. Kwiatkowski, S. Sampat, K. A. Bauer, B. Ehrich, V. Guiliano, J. H. Kelly, T. Z. Kosci, R. G. Peck, and L. J. Waxer, “Characterization of Mid-Chain Transmission and Losses on OMEGA.”

M. Labuzeta, J. Armstrong, M. Bonino, D. Canning, A. Consentino, S. Householder, M. Krieger, G. Pien, and C. Sorce, “Qualification Process for Experimental Users at the Omega Laser Facility.”

L. J. Waxer, “Omega Facility Overview.”

B. Rice, J. Ulreich, and M. J. Shoup III, “Prediction of Deuterium–Tritium Ice Layer Uniformity in Direct-Drive Confinement Fusion Target Capsules,” presented NAFEMS World Congress 2019, Quebec City, Canada, 17–20 June 2019.

S.-W. Bahk, “Phase Retrieval Using Gaussian Basis Functions,” presented at Computational Optical Sensing and Imaging, Munich, Germany, 24–27 June 2019.

V. N. Goncharov, “High-Energy-Density Physics Research at the Laboratory for Laser Energetics,” presented at JOWOG 37, Aldermaston, UK, 8–11 July 2019.

A. S. Davies, J. Katz, S. Bucht, D. Haberberger, J. P. Palastro, J. L. Shaw, D. Turnbull, R. Boni, I. A. Begishev, S.-W. Bahk, J. Bromage, A. Sorce, J. Konzel, B. Cuffney, J. D. Zuegel, D. H. Froula, W. Rozmus, J. D. Sadler, R. Trines, R. Bingham, and P. A. Norreys, “Investigation of Electron Plasma Waves and Picosecond Thermodynamics in a Laser-Produced Plasma Using Thomson Scattering,” presented at the 46th European Physical Society Conference on Plasma Physics, Milan, Italy, 8–12 July 2019.

D. H. Froula, “Lessons from Glenzer: Measuring Electron Distribution Functions with Thomson Scattering,” presented at the Workshop on High-Energy-Density Physics, Rostock, Germany, 12 July 2019.

M. S. Wei, H. G. Rinderknecht, J. D. Zuegel, J. Bromage, P. M. Nilson, S. X. Hu, D. H. Froula, F. Albert, B. M. Hegelich, M. Roth, and E. M. Campbell, “Frontiers in High-Energy-Density and Relativistic Plasma Physics Enabled by EP-OPAL: A Multibeam Ultrahigh-Intensity Laser User Facility,” presented at the First Community Workshop for High Energy, College Park, MD, 16–17 July 2019.

H. G. Rinderknecht, J. D. Zuegel, J. Bromage, M. S. Wei, P. M. Nilson, S. X. Hu, D. H. Froula, F. Albert, B. M. Hegelich, M. Roth, and E. M. Campbell, “Frontiers in High-Energy-Density and Relativistic Plasma Physics Enabled by EP-OPAL: A Multibeam Ultrahigh-Intensity Laser User Facility,” pre-

sented at the Discovery Plasma Science Community Planning Workshop, Madison, WI, 23–25 July 2019.

The following presentations were made at High-Energy-Density Science Summer School, La Jolla, CA, 28 July–10 August 2019:

A. Kish and A. B. Sefkow, “Preliminary Work Toward an Investigation of Burn-Wave Propagation in Magnetized Cylindrical Targets.”

T. T. Simpson, D. H. Froula, J. Vieira, and J. P. Palastro, “Non-linear Self-Focusing of Flying Focus Pulses.”

J. Wilson, V. N. Goncharov, C. Dorrer, A. Shvydky, and J. P. Palastro, “Broadband Smoothing of Laser Pulses for Imprint Reduction in Direct-Drive Inertial Confinement Fusion.”

M. S. Wei, “LaserNetUS–OMEGA EP Laser System and Experimental Capability,” presented at LaserNetUS, Virtual Meeting, 29 July 2019.

G. W. Collins, “Extreme Matters: Pressure to Explore Planets and Revolutionary Materials,” presented at the 27th International Conference on High Pressure Science and Technology (AIRAPT27), Rio de Janeiro, Brazil, 4–9 August 2019.

L. S. Leal, A. V. Maximov, R. Betti, A. B. Sefkow, and V. Ivanov, “HYDRA Modeling of Laser-Ablated Plasma in Megagauss Magnetic Fields,” presented at the Tenth Workshop on Fundamental Science with Pulsed Power and User Meeting, Albuquerque, NM, 11–14 August 2019.

R. B. Spielman and E. M. Campbell, “OMEGA-Z: A 15-TW Pulsed-Power Facility for High-Energy-Density Physics,” presented at the Z Fundamental Science Program Workshop, Albuquerque, NM, 11–14 August 2019.

T. Filkins, J. Katz, and S. T. Ivancic, "Design of an Image-Relay Optical Time-Domain Reflectometer to Measure Fiber-Optic Time Delays at Inertial Confinement Fusion Relevant Wavelengths," presented at SPIE Optical Engineering and Applications, San Diego, CA, 11–15 August 2019.

K. L. Marshall, D. J. Batesky, J. U. Wallace, L. Garrett, T. Z. Kosc, S. Papernov, B. N. Hoffman, and J. Shojaie, "UV-Transmissive Glassy Liquid Crystals Employing Chiral Synthons Based on Natural Products," presented at SPIE Optics and Photonics, Liquid Crystals XXIII, San Diego, CA, 11–15 August 2019 (invited).

The following presentations were made at the International Workshop on Optical Thomson Scattering, Rochester, NY, 13–14 August 2019:

A. S. Davies, J. Katz, S. Bucht, D. Haberberger, J. P. Palastro, J. L. Shaw, D. Turnbull, R. Boni, I. A. Begishev, S.-W. Bahk, J. Bromage, A. Sorce, J. Konzal, R. Cuffney, J. D. Zuegel, D. H. Froula, and W. Rozmus, "Investigation of Electron Plasma Waves and Picosecond Thermodynamics in a Laser-Produced Plasma Using Thomson Scattering."

R. K. Follett, J. A. Delettrez, D. H. Edgell, R. J. Hennen, J. Katz, J. F. Myatt, and D. H. Froula, "Subtleties to Fitting Thomson-Scattering Spectra."

A. M. Hansen, D. Turnbull, J. Katz, A. L. Milder, J. P. Palastro, D. Mastrosimone, and D. H. Froula, "Phase Plates in Thomson-Scattering Experiments."

J. Katz, "Lessons Learned from the Implementation and Operation of the OMEGA Thomson Scattering System."

A. L. Milder, J. Katz, R. Boni, D. Nelson, J. P. Palastro, K. Daub, R. K. Follett, and D. H. Froula, "Measurements of Arbitrary Distribution Functions Using Angularly Resolved Thomson Scattering."

H. G. Rinderknecht, H. S. Park, J. S. Ross, P. A. Amendt, D. P. Higginson, S. C. Wilks, R. K. Follett, D. Haberberger, J. Katz, D. H. Froula, N. M. Hoffman, G. Kagan, B. Keenan, A. Simakov, L. Chacon, and E. Vold, "Imaging Thomson Scattering: Measuring Plasma Conditions in a Strong Shock."

H. G. Rinderknecht, D. H. Froula, S. X. Hu, P. M. Nilson, and J. D. Zuegel, "Frontiers in Physics Enabled by EP-OPAL: A Multibeam Ultra-Intense Laser User Facility," presented at ExHILP 2019, Stanford, CA, 3–6 September 2019.

J. D. Zuegel, "The Brightest Light Initiative (BLI): A Path Forward for Ultra-Intense Ultrafast Lasers in the U.S.," presented at Frontiers in Optics, Washington, DC, 15–19 September 2019.

The following presentations were made at the 41st Tritium Focus Group Meeting, Augusta, GA, 17–19 September 2019:

D. Bassler, "Making an Optimal Hafnium Oxide Film as a Hydrogen Diffusion Barrier."

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, "Distribution of Tritium in the Near Surface of 316 Stainless Steel."

M. Sharpe and W. T. Shmayda, "Measurement of Palladium Hydride Isotherms Between 130 K and 393 K Using Pure H₂, Pure D₂, and HD Mixtures."

The following presentations were made at the U.S.–Japan Workshop on Theory and Simulations of High Energy Density Physics with Extreme Fields, Osaka, Japan, 21–22 September 2019:

D. H. Froula, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, A. Davies, R. K. Follett, D. Haberberger, A. Howard, G. Jenkins, J. Katz, T. J. Kessler, L. Nguyen, J. P. Palastro, D. Ramsey, J. L. Shaw, D. Turnbull, N. Vafaei-Najafabadi, J. Vieira, and F. Quéré, "Flying Focus: Spatiotemporal Control of Intensity for Laser-Based Applications."

H. G. Rinderknecht, M. S. Wei, J. P. Palastro, G. Bruhaug, A. Arefiev, T. Wang, T. Toncian, H. J. Quevedo, T. Ditmire, and J. Williams, "Megatesla Magnetic Fields and Efficient Gamma-Ray Generation Using Microstructured Targets: Preparations for Experiments at TPW."

The following presentations were made at Laser Damage 2019, Boulder, CO, 22–25 September 2019:

B. N. Hoffman, A. A. Kozlov, J. B. Oliver, T. J. Kessler, A. L. Rigatti, S. G. Demos, A. Shestopalov, and N. Liu, “Damage Morphology and Damage-Initiation Mechanisms in Multilayer Dielectric Gratings at Different Pulse Durations.”

K. R. P. Kafka, S. G. Demos, and B. N. Hoffman, “Short-Pulse Laser Irradiation of Microparticle Contamination on Reflective Optics.”

A. A. Kozlov, D. Canning, B. N. Hoffman, B. E. Kruschwitz, A. L. Rigatti, and L. J. Waxer, “Review of Decade-Long Monitoring Damage Resistance of Multilayer Dielectric Gratings Inside the Vacuum Compressor Chamber on OMEGA EP.”

L. Lamainière, A. Ollé, M. Chourel, N. Roquin, A. A. Kozlov, B. N. Hoffman, J. B. Oliver, L. Gallais, and S. G. Demos, A. Melninkaitis, “Round-Robin Measurements of Optical Monolayer Laser-Induced–Damage Threshold in the Sub-picosecond Range.”

J. B. Oliver, “Coatings for Large-Aperture Laser Systems.”

A. A. Shestopalov, N. Liu, B. N. Hoffman, A. A. Kozlov, and S. G. Demos, “Chemical Composition, Structure Morphology, Contaminant Cleaning and Laser-Induced–Damage Threshold in Coarse Fused-Silica Gratings.”

J. U. Wallace, K. L. Marshall, T. Z. Kosc, D. J. Batesky, B. N. Hoffman, S. Papernov, L. Garrett, J. Shojaie, and S. G. Demos, “Laser-Induced–Damage Behavior of Novel Glassy Liquid Crystal Materials at 1 ns and Multiple Wavelengths.”

A. Milder, J. Katz, R. Boni, D. Nelson, J. P. Palastro, A. M. Hansen, D. Turnbull, P. Franke, S. T. Ivancic, J. L. Shaw, K. Daub, R. K. Follett, D. H. Froula, H. Le, M. Sherlock, and W. Rozmus, “Novel Techniques and Uses of Collective Thomson Scattering,” presented at Laser Aided Plasma Diagnostics 2019, Whitefish, MT, 22–26 September 2019.

The following presentations were made at 11th International Conference on Inertial Fusion Science and Applications, Osaka, Japan, 22–27 September 2019:

A. R. Christopherson, R. Betti, S. Miller, V. Gopalaswamy, D. Cao, and O. M. Mannion, “Theory of Ignition and Burn Propagation in Inertially Confined Plasmas.”

D. H. Froula, C. Dorrer, E. M. Hill, J. Bromage, T. J. Kessler, J. D. Zuegel, R. K. Follett, L. Nguyen, A. A. Solodov, J. P. Palastro, D. Turnbull, D. H. Edgell, J. G. Shaw, A. M. Hansen, A. L. Milder, J. Katz, R. Boni, V. N. Goncharov, M. Sherlock, H. Le, D. J. Strozzi, P. Michel, L. Divol, J. F. Myatt, W. Rozmus, J. Bates, A. Schmitt, J. Weaver, A. Colaïtis, L. Yin, and B. Albright, “A Path to an Expanded Inertial Confinement Fusion Design Space Through a Better Understanding and Mitigation of Laser–Plasma Instabilities.”

F. García Rubio, R. Betti, and H. Aluie, “The Effect of Self-Generated Magnetic Fields on the Ablative Rayleigh–Taylor Instability Dynamics.”

V. N. Goncharov, “Progress Toward the Demonstration of Burning Plasma in the U.S. Inertial Confinement Fusion Program.”

V. Gopalaswamy, R. Betti, J. P. Knauer, A. Lees, D. Patel, A. R. Christopherson, K. M. Woo, O. M. Mannion, Z. L. Mohammed, F. J. Marshall, C. Stoeckl, V. Yu. Glebov, S. P. Regan, R. C. Shah, D. H. Edgell, D. Cao, V. N. Goncharov, I. V. Igumenshchev, P. B. Radha, T. J. B. Collins, T. C. Sangster, E. M. Campbell, M. Gatu Johnson, R. D. Petrasso, C. K. Li, and J. A. Frenje, “Statistically Guided Design of Direct-Drive Inertial Confinement Fusion Experiments.”

S. X. Hu, R. Epstein, W. Theobald, V. N. Goncharov, S. P. Regan, P. W. McKenty, R. Betti, E. M. Campbell, H. Xu, H. Huang, and D. S. Montgomery, “Direct-Drive Double-Shell (D³S) Implosion: A Platform for Burning-Plasma Studies.”

P. B. Radha, M. J. Rosenberg, A. Shvydky, A. A. Solodov, R. Betti, E. M. Campbell, T. J. B. Collins, R. S. Craxton, V. N. Goncharov, J. A. Marozas, F. J. Marshall, S. P. Regan, T. C. Sangster, and D. Turnbull, “Direct-Drive Physics at the National Ignition Facility.”

S. P. Regan, V. N. Goncharov, T. C. Sangster, R. Betti, E. M. Campbell, K. A. Bauer, T. R. Boehly, M. J. Bonino, D. Cao, A. R. Christopherson, G. W. Collins, T. J. B. Collins, R. S. Craxton, D. H. Edgell, R. Epstein, C. J. Forrest, R. K. Follett, D. H. Froula, V. Yu. Glebov, V. Gopalaswamy, D. R. Harding, S. X. Hu, I. V. Igumenshchev, S. T. Ivancic, D. W. Jacobs-Perkins, R. T. Janezic, J. H. Kelly, T. J. Kessler, J. P. Knauer, T. Z. Kosc, O. M. Mannion, J. A. Marozas, F. J. Marshall, P. W.

McKenty, Z. L. Mohamed, S. F. B. Morse, P. M. Nilson, J. P. Palastro, D. Patel, J. L. Peebles, P. B. Radha, H. G. Rinderknecht, M. J. Rosenberg, S. Sampat, W. Seka, R. C. Shah, J. R. Rygg, J. G. Shaw, W. T. Shmayda, M. J. Shoup III, A. Shvydky, A. A. Solodov, C. Sorce, C. Stoeckl, W. Theobald, D. Turnbull, J. Ulreich, M. D. Wittman, K. M. Woo, J. D. Zuegel, J. A. Frenje, M. Gatu Johnson, R. D. Petrasso, M. Karasik, S. P. Obenschain, A. J. Schmitt, T. J. Hilsabeck, K. Englehorn, J. D. Kilkenny, J. D. Hares, A. K. L. Dymoke-Bradshaw, P. Bell, A. Carpenter, D. K. Bradley, S. Nagel, G. Rochau, and L. Claus, "Multidimensional Effects on Hot-Spot Formation in OMEGA DT Cryogenic Implosions."

H. Rinderknecht, C. J. Forrest, J. P. Knauer, W. Theobald, S. P. Regan, R. Simpson, and J. A. Frenje, "Knock-On Deuteron Imaging to Diagnose Hot-Spot Fuel and ρR Symmetry in Directly Driven Inertial Confinement Fusion Implosions."

M. Zaghoo, T. R. Boehly, J. R. Rygg, P. M. Celliers, S. X. Hu, and G. W. Collins, "Breakdown of Fermi Degeneracy in Shocked Deuterium."

J. D. Zuegel, "Laboratory for Laser Energetics," presented at the Visit of the Honorable Carl Heastie, Speaker of the NYS Assembly, Rochester, NY, 23 September 2019.

M. S. Wei, "Opportunities for U.S.–ELI Collaborations: Laboratory for Laser Energetics Perspective," presented at the U.S.–ELI Joint Workshop, Washington, DC, 25 September 2019.

R. Betti, "Status and Prospects for Nuclear Fusion with Lasers," presented at FisMat 2019, Catania, Italy, 30 September–4 October 2019 (invited).