

## Publications and Conference Presentations

### Publications

- S.-W. Bahk, “Analytic Phase Solutions of Three-Wave Interactions,” *Opt. Lett.* **46**, 5368 (2021).
- I. A. Begishev, V. Bagnoud, S.-W. Bahk, W. A. Bittle, G. Brent, R. Cuffney, C. Dorrer, D. H. Froula, D. Haberberger, C. Mileham, P. M. Nilson, A. V. Okishev, J. L. Shaw, M. J. Shoup III, C. R. Stillman, C. Stoeckl, D. Turnbull, B. Wager, J. D. Zuegel, and J. Bromage, “Advanced Laser Development and Plasma-Physics Studies on the Multiterawatt Laser,” *Appl. Opt.* **60**, 11,104 (2021).
- M. D. Bergkoetter, B. E. Kruschwitz, S.-W. Bahk, and J. R. Fienup, “Measurement of Chromatic Aberrations Using Phase Retrieval,” *J. Opt. Soc. Am. A* **38**, 1853 (2021).
- A. F. A. Bott, L. Chen, G. Boutoux, T. Caillaud, A. Duval, M. Koenig, B. Khair, I. Lantuéjoul, L. Le-Deroff, B. Reville, R. Rosch, D. Ryu, C. Spindloe, B. Vauzour, B. Villette, A. A. Schekochihin, D. Q. Lamb, P. Tzeferacos, G. Gregori, and A. Casner, “Inefficient Magnetic-Field Amplification in Supersonic Laser-Plasma Turbulence,” *Phys. Rev. Lett.* **127**, 175002 (2021).
- J. Bromage, S.-W. Bahk, M. Bedzyk, I. A. Begishev, S. Bucht, C. Dorrer, C. Feng, C. Jeon, C. Mileham, R. G. Roides, K. Shaughnessy, M. J. Shoup III, M. Spilatro, B. Webb, D. Weiner, and J. D. Zuegel, “MTW-OPAL: A Technology Development Platform for Ultra-Intense Optical Parametric Chirped-Pulse Amplification Systems,” *High Power Laser Sci. Eng.* **9**, e63 (2021).
- Y.-Y. Chang, X. Cheng, A. Hannasch, M. LaBerge, J. M. Shaw, K. Weichman, J. Welch, A. C. Bernstein, W. Henderson, R. Zgadzaj, and M. C. Downer, “Faraday Rotation Study of Plasma Bubbles in GeV Wakefield Accelerators,” *Phys. Plasmas* **28**, 123105 (2021).
- A. Colaitis, I. Igumenshchev, J. Mathiaud, and V. Goncharov, “Inverse Ray Tracing on Icosahedral Tetrahedron Grids for Non-Linear Laser Plasma Interaction Coupled to 3D Radiation Hydrodynamics,” *J. Comput. Phys.* **443**, 110537 (2021).
- C. Feng, C. Dorrer, C. Jeon, R. Roides, B. Webb, and J. Bromage, “Analysis of Pump-to-Signal Noise Transfer in Two-Stage Ultra-Broadband Optical Parametric Chirped-Pulse Amplification,” *Opt. Express* **29**, 40,240 (2021).
- P. Franke, D. Ramsey, T. T. Simpson, D. Turnbull, D. H. Froula, and J. P. Palastro, “Optical Shock-Enhanced Self-Photon Acceleration,” *Phys. Rev. A* **104**, 043520 (2021).
- V. Gopalaswamy, R. Betti, J. P. Knauer, A. Lees, D. Patel, A. R. Christopherson, I. V. Igumenshchev, D. Cao, K. S. Anderson, A. Shvydky, D. H. Edgell, O. M. Mannion, C. Thomas, W. Theobald, C. Stoeckl, S. P. Regan, V. N. Goncharov, R. C. Shah, and E. M. Campbell, “Using Statistical Modeling to Predict and Understand Fusion Experiments,” *Phys. Plasmas* **28**, 122705 (2021).
- S. Heidtfeld, R. Adam, T. Kubota, K. Takanashi, D. Cao, C. Schmitz-Antoniak, D. E. Bürgler, F. Wang, C. Greb, G. Chen, I. Komissarov, H. Hardtdegen, M. Mikulics, R. Sobolewski, S. Suga, and C. M. Schneider, “Generation of Terahertz Transients from  $\text{CO}_2\text{Fe}_{0.4}\text{Mn}_{0.6}\text{Si}$ -Heusler-Alloy/Normal-Metal Nanobilayers Excited by Femtosecond Optical Pulses,” *Phys. Rev. Research* **3**, 043025 (2021).
- J. Jeet, A. B. Zylstra, M. Rubery, Y. Kim, K. D. Meaney, C. Forrest, V. Glebov, C. J. Horsfield, A. M. McEvoy, and H. W. Herrmann, “Inertial-Confinement Fusion-Plasma-Based Cross-Calibration of the Deuterium-Tritium  $\gamma$ -to-Neutron Branching Ratio,” *Phys. Rev. C* **104**, 054611 (2021).
- G. W. Jenkins, C. Feng, and J. Bromage, “Alignment Tolerance Analysis for Divided-Pulse Nonlinear Compression,” *J. Opt. Soc. Am. B* **38**, 3199 (2021).
- V. V. Karasiev, J. Hinz, S. X. Hu, and S. B. Trickey, “On the Liquid-Liquid Phase Transition of Dense Hydrogen,” *Nature* **600**, E12 (2021).

D. I. Mihaylov, V. V. Karasiev, S. X. Hu, J. R. Rygg, V. N. Goncharov, and G. W. Collins, “Improved First-Principles Equation-of-State Table of Deuterium for High-Energy-Density Applications,” *Phys. Rev. B* **104**, 144104 (2021).

S. F. Nwabunwanne and W. R. Donaldson, “Boosting the External Quantum Efficiency of AlGaIn-Based Metal–Semiconductor–Metal Ultraviolet Photodiodes by Electrode Geometry Variation,” *IEEE J. Quantum Electron.* **57**, 4000608 (2021).

A. M. Saunders, C. V. Stan, K. K. Mackay, B. Morgan, J. A. K. Horwitz, S. J. Ali, H. G. Rinderknecht, T. Haxhimali, Y. Ping, F. Najjar, J. Eggert, and H.-S. Park, “Experimental Observations of Laser-Driven Tin Ejecta Microjet Interactions,” *Phys. Rev. Lett.* **127**, 155002 (2021).

A. Shvydky, A. V. Maximov, V. V. Karasiev, D. Haberberger, S. X. Hu, and V. N. Goncharov, “Ionization State and Dielectric

Constant in Cold Rarefied Hydrocarbon Plasmas of Inertial Confinement Fusion,” *Phys. Rev. E* **104**, 045207 (2021).

A. Tentori, A. Colartis, W. Theobald, A. Casner, D. Raffestin, A. Ruocco, J. Trela, E. Le Bel, K. Anderson, M. Wei, B. Henderson, J. Peebles, R. Scott, S. Baton, S. A. Pikuz, R. Betti, M. Khan, N. Woolsey, S. Zhang, and D. Batani, “Experimental Characterization of Hot-Electron Emission and Shock Dynamics in the Context of the Shock Ignition Approach to Inertial Confinement Fusion,” *Phys. Plasmas* **28**, 103302 (2021).

W. Trickey, V. N. Goncharov, I. V. Igumenshchev, A. Shvydky, T. J. B. Collins, and E. M. Campbell, “Central Density and Low-Mode Perturbation Control of Inertial Confinement Fusion Dynamic-Shell Targets,” *Front. Phys.* **9**, 784258 (2021).

C. A. Williams, R. Betti, V. Gopalaswamy, and A. Lees, “High Yields in Direct-Drive Inertial Confinement Fusion Using Thin-Ice DT Liner Targets,” *Phys. Plasmas* **28**, 122708 (2021).

### Forthcoming Publications

P. T. Campbell, C. A. Walsh, B. K. Russell, J. P. Chittenden, A. Crilly, G. Fiksel, L. Gao, I. V. Igumenshchev, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, and L. Willingale, “Measuring Magnetic Flux Suppression in High-Power Laser–Plasma Interactions,” to be published in *Physics of Plasmas*.

T. J. B. Collins, C. Stoeckl, R. Epstein, W. A. Bittle, C. J. Forrest, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, S. X. Hu, D. W. Jacobs-Perkins, T. Z. Kosc, J. A. Marozas, C. Mileham, 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, and M. D. Wittman, “Causes of Fuel–Ablator Mix Inferred from Modeling of Monochromatic Time-Gated Radiography in OMEGA Cryogenic Implosions,” to be published in *Physics of Plasmas*.

M. F. Kasim, D. Watson-Parris, L. Deaconu, S. Oliver, P. Hatfield, D. H. Froula, G. Gregori, M. Jarvis, S. Khatiwala, J. Korenaga, J. Topp-Mugglestone, E. Viezzer, and S. M. Vinko, “Building High-Accuracy Emulators for Scientific Simulations with Deep Neural Architecture Search,” to be published in *Machine Learning: Science and Technology*.

R. G. Kraus, R. J. Hemley, S. J. Ali, J. L. Belof, L. X. Benedict, J. Bernier, D. Braun, R. E. Cohen, G. W. Collins, F. Coppari, M. P. Desjarlais, D. Fratanduono, S. Hamel, A. Krygier,

A. Lazicki, J. Mcnane, M. Millot, P. C. Myint, M. G. Newman, J. R. Rygg, D. M. Sterbentz, S. T. Stewart, L. Stixrude, D. C. Swift, C. Wehrenberg, and J. H. Eggert, “Measuring the Melting Curve of Iron at Super-Earth Core Conditions,” to be published in *Science*.

N. R. Shaffer and C. E. Starrett, “Dense Plasma Opacity via the Multiple-Scattering Method,” to be published in *Physical Review E*.

R. Sobolewski, “Optical Detectors and Sensors,” to be published in the *Handbook of Superconducting Materials*.

G. F. Swadling and J. Katz, “Novel Design for a Polarizing DUV Spectrometer Using a Wollaston Prism and Its Application as a Diagnostic for Measuring Thomson Scattering Data in the Presence of Strong Self-Emission Backgrounds,” to be published in the *Review of Scientific Instruments*.

W. Theobald, D. Cao, R. C. Shah, C. A. Thomas, I. V. Igumenshchev, K. A. Bauer, R. Betti, M. J. Bonino, E. M. Campbell, A. R. Christopherson, K. Churnetski, D. H. Edgell, C. J. Forrest, J. A. Frenje, M. Gatu Johnson, V. Yu. Glebov, V. N. Goncharov, V. Gopalaswamy, D. R. Harding, S. X. Hu, S. T. Ivancic, D. W. Jacobs-Perkins, R. T. Janezic, T. Joshi, J. P.

Knauer, A. Lees, R. W. Luo, O. M. Mannion, F. J. Marshall, Z. L. Mohamed, S. F. B. Morse, D. Patel, J. L. Peebles, R. D. Petrasso, P. B. Radha, H. G. Rinderknecht, M. J. Rosenberg, S. Sampat, T. C. Sangster, W. T. Shmayda, C. M. Shulberg, A. Shvydky, C. Sorce, C. Stoeckl, M. D. Wittman, and S. P. Regan, “Enhanced Laser-Energy Coupling with Small-Spot

Distributed Phase Plates (SG5-650) in OMEGA DT Cryogenic Target Implosions,” to be published in *Physics of Plasmas*.

D. Zhao, R. Betti, and H. Aluie, “Scale Interactions and Anisotropy in Rayleigh–Taylor Turbulence,” to be published in the *Journal of Fluid Mechanics*.

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### Conference Presentations

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The following presentations were made at Advanced Solid-State Lasers, Ontario, Canada, 3–7 October 2021:

C. Dorrer, I. A. Begishev, S.-W. Bahk, and J. Bromage, “Spatially Resolved Characterization of Partially Deuterated KDP Crystals for Parametric Amplification.”

G. W. Jenkins, C. Feng, and J. Bromage, “Simultaneous Spectral Broadening and Contrast Improvement Using Divided-Pulse Nonlinear Compression.”

M. Spilatro and C. Dorrer, “Versatile Spectral Shaping of Spectrally Incoherent Pulses in the IR and UV.”

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A. K. Schwemlein, C. Fagan, W. T. Shmayda, M. Sharpe, C. Stoeckl, C. J. Forrest, S. P. Regan, and W. U. Schröder, “First Demonstration of a Triton Beam Using Target Normal Sheath Acceleration,” presented at the American Physical Society Division of Nuclear Physics, Boston, MA, 10–14 October 2021.

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D. A. Chin, P. M. Nilson, D. T. Bishel, E. Smith, X. Gong, M. K. Ginnane, B. J. Henderson, D. N. Polsin, T. R. Boehly, J. R. Rygg, G. W. Collins, D. Trail, A. Amouretti, M. Harmand, O. Mathon, R. Torchio, J. J. Ruby, F. Coppari, A. Coleman, and Y. Ping, “XANES and EXAFS Progress Studying Compressed Iron Oxides on OMEGA,” presented at Matter in Extreme Conditions from Material Science to Planetary Physics, virtual, 12–13 October 2021.

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The following presentations were made at Laser Damage, virtual, 12–15 October 2021:

D. Broege, S. G. Demos, C. Dorrer, K. R. P. Kafka, and M. Spilatro, “The Impact of Intensity Fluctuations on Laser Damage.”

R. Dent, B. N. Hoffman, A. A. Kozlov, N. Liu, A. L. Rigatti, S. G. Demos, and A. A. Shestopalov, “Embedded Contamination Induced by Etching in E-Beam-Deposited Silica: A Possible Precursor to Laser Damage.”

S. Elhadj, C. Gavin, A. Bayramian, W. Clauson, M. Murachver, J. Jarboe, D. Kissinger, C. LeBlanc, N. Urban, J. Wallace, S. Demos, and K. L. Marshall, “Large-Area, Multi-Pulse Laser Lifetime of Purified Nematic Liquid Crystals at Near-Infrared Wavelengths.”

R. Jia, B. N. Hoffman, A. A. Kozlov, S. G. Demos, and A. A. Shestopalov, “Monolayer Organic Thin Films as Contamination-Resistant Coatings in Optical Elements.”

K. R. P. Kafka, T. Z. Kosc, and S. G. Demos, “Methods and Apparatus for Laser Damage and Functional Performance Characterization of Ultrafast Laser Optics.”

T. Z. Kosc, S. G. Demos, T. J. Kessler, H. Huang, A. Maltsev, R. Negres, and J. C. Lambropoulos, “Minimizing Risk for Laser Damage Due to Transverse Stimulated Raman Scattering in Large-Aperture KDP/DKDP Plates for Polarization Control at  $3\omega$ .”

K. L. Marshall, K. R. P. Kafka, N. D. Urban, J. U. Wallace, and S. G. Demos, “The Effect of Incident Polarization Handedness and Ellipticity on the Laser-Damage Resistance of Oriented Liquid Crystals in the Nanosecond Regime.”

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P. Tzeferacos, “Big Computers and Big Lasers: How Concerted Numerical Simulations and Laser-Driven Laboratory Experiments Can Shed Light on Fundamental Astrophysical Processes in Turbulent Magnetized Plasmas,” presented at CIRC Symposium, Rochester, 15 October 2021.

The following presentations were made at the Industrial Associates Meeting, Rochester, NY, 20–22 October 2021:

G. Chen, R. Adam, D. E. Bürgler, J. Cheng, D. Chakraborty, I. Komissarov, S. Heidtfield, D. Cao, H. Hardtdegen, M. Mikulics, A. Alostaz, F. Wang, M. Büscher, C. M. Schneider, L. Gladczuk, P. Przystupki, and R. Sobolewski, “Ultrabroadband Spintronic THz Emitters Excited by Femtosecond Laser Pulse.”

G. W. Jenkins, C. Feng, and J. Bromage, “Simultaneous Spectral Broadening and Contrast Improvement Using Divided-Pulse Nonlinear Compression.”

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E. M. Campbell, “A Vision for the Future for High-Power Laser Research and Applications,” presented at OPTICSMEET 2021, Nice, France, 1–3 November 2021.

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The following presentations were made at the 42nd Tritium Focus Group, Los Alamos, NM, 2–3 November 2021:

M. Sharpe and W. T. Shmayda, “Measurement of Palladium Hydride Isotherms Using  $H_2$ ,  $D_2$ , and  $H_2/D_2$  Mixtures.”

W. T. Shmayda, H. Mutha, and K. Ryan, “The SPARC Tritium Fuel Cycle.”

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The following presentations were made at the 63rd Annual Meeting of the American Physical Society Division of Plasma Physics, Pittsburgh, PA, 8–12 November 2021:

M. B. P. Adams, P.-A. Gourdain, P. Tzeferacos, S. Feister, J. J. Pilgram, C. G. Constantin, and C. Niemann, “Exploration of Magnetic-Field Generation via Biermann Battery Using the *FLASH* Code to Model Experiments Performed at UCLA’s Phoenix Laboratory.”

M. V. Ambat, R. Boni, J. L. Shaw, P. Franke, K. R. McMillen, M. VanDusen-Gross, H. G. Rinderknecht, D. Ramsey, T. T. Simpson, J. P. Palastro, S.-W. Bahk, J. Bromage, and D. H. Froula, “Effects of Chromatic Aberration in a Dephasingless Laser Wakefield Accelerator.”

K. S. Anderson, E. C. Hansen, J. A. Marozas, T. J. B. Collins, V. N. Goncharov, M. M. Marinak, and S. Sepke, “Computational Modeling of the Target Mounting Stalk in Direct-Drive Implosions.”

A. Armstrong, A. Reyes, M. B. P. Adams, P. Farmakis, E. C. Hansen, Y. Lu, D. Michta, K. Moczulski, D. Q. Lamb, and P. Tzeferacos, “Implementation and Verification of Braginskii Viscosity in the *FLASH* Code.”

J. Baltazar, R. C. Shah, D. Cao, V. Gopalaswamy, R. Betti, D. Patel, C. Stoeckl, W. Theobald, K. M. Woo, and S. P. Regan, “Diagnosing Low-Mode ( $\ell \leq 6$ ) and Mid-Mode ( $6 < \ell \leq 40$ ) Asymmetries in the Explosion Phase of Laser-Direct-Drive DT Cryogenic Implosions on OMEGA.”

D. H. Barnak, R. Betti, V. Gopalaswamy, A. Lees, and A. Shvydky, “Understanding Shock-Release Experiments Using a Numerical Simulation of VISAR.”

D. T. Bishel, P. M. Nilson, D. A. Chin, J. J. Ruby, E. Smith, S. X. Hu, J. R. Rygg, G. W. Collins, and E. V. Marley, “Utilizing Implosions to Constrain Atomic Physics of Gbar Materials.”

G. Bruhaug, H. G. Rinderknecht, M. S. Wei, D. T. Bishel, G. W. Collins, J. R. Rygg, Y. E. K. Garriga, X. C. Zhang, R. Smith, A. Necas, and K. Zhai, “High-Power, High-Energy THz Generation with Joule and Kilojoule-Class Lasers.”

M. Burns, R. K. Follett, A. Bowman, S. Zhai, A. Poudel, S. Dwarkadas, S. Pai, and A. B. Sefkow, “Heterogeneous Plasma Physics Codes in TriForce: Progress and Next Steps.”

D. Cao, R. C. Shah, C. A. Thomas, A. Lees, V. Gopalaswamy, R. Betti, D. Patel, W. Theobald, J. P. Knauer, P. B. Radha, C. Stoeckl, S. P. Regan, W. Scullin, T. J. B. Collins, and V. N. Goncharov, “Understanding Origins of Observed Fusion-Yield Dependencies for Direct-Drive Implosions on OMEGA.”

S. H. Cao, R. Betti, V. Gopalaswamy, H. Huang, D. Patel, C. Ren, M. J. Rosenberg, A. Shvydky, C. Stoeckl, and H. Wen, “Predicting Hot-Electron Generation in Inertial Confinement Fusion with Particle-in-Cell Simulations.”

A. Casner, V. Bouffetier, L. Ceurvorst, G. Perez Callejo, T. Goudal, H. W. Sio, J. L. Peebles, P. Tzeferacos, V. Smalyuk, and O. A. Hurricane, “Mitigation of the Kelvin–Helmholtz Instability in HED Conditions by a Strong External Magnetic Field.”

- L. Ceurvorst, L. Masse, S. Khan, D. A. Martinez, N. Izumi, V. A. Smalyuk, T. Goudal, V. Bouffetier, A. Casner, B. Canaud, V. N. Goncharov, and I. V. Igumenshchev, “Effects of Ablation and Mode Coupling on the Deeply Nonlinear Stages of the Rayleigh–Taylor Instability.”
- D. A. Chin, P. M. Nilson, D. T. Bishel, E. Smith, R. S. Craxton, J. R. Rygg, G. W. Collins, J. J. Ruby, F. Coppari, A. Coleman, and Y. Ping, “Characterization of X-Ray Emission from Spherical Shells for X-Ray Absorption Spectroscopy Experiments on OMEGA 60.”
- S. Chowdry, S. Zhang, S. X. Hu, and G. Kagan, “Incorporating Quantum Electronics in Classical Calculations for Dense Plasmas.”
- K. Churnetski, K. M. Woo, W. Theobald, P. B. Radha, R. Betti, V. Gopalaswamy, I. V. Igumenshchev, S. T. Ivancic, M. Michalko, R. C. Shah, C. Stoeckl, C. A. Thomas, and S. P. Regan, “Three-Dimensional Hot-Spot Reconstruction from Cryogenic DT Polar-Direct-Drive Implosions on OMEGA.”
- A. Colaitis, D. H. Edgell, I. V. Igumenshchev, D. Turnbull, J. P. Palastro, R. K. Follett, V. N. Goncharov, and D. H. Froula, “Low-Mode Asymmetry Induced by Polarized Cross-Beam Energy Transfer Interaction in Laser-Direct-Drive Spherical Implosions on OMEGA.”
- T. J. B. Collins, P. M. Nilson, R. Epstein, D. T. Bishel, D. A. Chin, J. J. Ruby, J. Kendrick, D. Guy, S. T. Ivancic, F. J. Marshall, C. Stoeckl, V. N. Goncharov, and D. H. Froula, “Theory and Modeling of Blast-Wave–Driven Interfacial Hydrodynamic Instability in OMEGA Planar Experiments.”
- R. S. Craxton, W. Y. Wang, M. A. Marangola, and E. M. Campbell, “A Dual Laser-Beam Configuration Compatible with Both Symmetric Direct Drive and Spherical Hohlräume.”
- J. R. Davies, D. H. Barnak, E. C. Hansen, P. V. Heuer, L. S. Leal, J. L. Peebles, and A. Birkel, “Evaluation of Direct Inversion of Proton Radiographs in the Context of Cylindrical Implosions.”
- A. Diaw, N. M. Cook, S. Coleman, J. P. Edelen, E. C. Hansen, and P. Tzeferacos, “Resistivity and Heat Conduction Modeling in Capillary Discharges.”
- D. H. Edgell, A. Colaitis, R. S. Craxton, R. K. Follett, M. J. Guardalben, A. Kalb, J. Katz, J. Kwiatkowski, O. M. Mannion, P. B. Radha, A. Shvydky, C. Stoeckl, D. Turnbull, and D. H. Froula, “Nonuniformity in Direct-Drive Implosions Caused by Polarization Smoothing” (invited).
- R. Ejaz, V. Gopalaswamy, and R. Betti, “A Deep Learning Approach to Design Inertial Confinement Fusion Experiments.”
- R. Epstein, V. N. Goncharov, S. X. Hu, D. Cao, A. Shvydky, P. W. McKenty, G. W. Collins, D. Haberberger, J. L. Kline, and S. M. Finnegan, “Assessment of Radiation Trapping in Inertial Confinement Fusion Implosion Experiments with High-Z–Lined, Single-Shell Targets.”
- P. Farmakis, M. McMullan, A. Reyes, J. Laune, M. B. P. Adams, A. Armstrong, E. C. Hansen, Y. Lu, D. Michta, K. Moczulski, D. Lamb, and P. Tzeferacos, “Expanding the Tabulated Equation-of-State Implementations in the *FLASH* Code for the *SESAME* Database.”
- R. K. Follett, H. Wen, J. G. Shaw, D. H. Froula, A. V. Maximov, A. A. Solodov, D. Turnbull, J. P. Palastro, J. F. Myatt, and J. W. Bates, “A Local-Field Approach to Understanding Multibeam Laser–Plasma Instabilities.”
- C. J. Forrest, D. Cao, V. N. Glebov, V. N. Goncharov, V. Gopalaswamy, J. P. Knauer, O. M. Mannion, Z. L. Mohamed, S. P. Regan, R. C. Shah, C. Stoeckl, and K. M. Woo, “Inference of Isotropic and Anisotropic Flow in Laser Direct-Drive Cryogenic DT Implosions on OMEGA.”
- P. Franke, D. Ramsey, T. T. Simpson, D. Turnbull, D. H. Froula, and J. P. Palastro, “Optical Shock-Enhanced Self-Photon Acceleration.”
- F. García-Rubio, R. Betti, J. Sanz, and H. Aluie, “Magneto-hydrodynamic Instabilities in Ablation Fronts and Coronal Plasmas” (invited).
- M. Gatu Johnson, P. J. Adrian, J. A. Frenje, T. M. Johnson, N. Kabadi, B. G. Lahmann, R. Petrasso, W. J. Garbett, R. S. Craxton, M. Hohenberger, H. D. Whitley, C. B. Yeamans, and A. B. Zylstra, “Measurement of Hot-Electron-Driven Fast Ions in Polar-Direct-Drive Exploding-Pusher Implosions on the NIF.”
- M. K. Ginnane, D. N. Polsin, X. Gong, M. C. Marshall, T. R. Boehly, J. R. Rygg, G. W. Collins, A. Lazicki, R. Kraus, J. H. Eggert, D. E. Fratanduono, J. P. Davis, C. A. McCoy, C. Seagle, and S. Root, “X-Ray Diffraction Measurements of Shocked and Shock-Ramped Platinum.”

V. N. Goncharov, I. V. Igumenshchev, W. Trickey, N. Shaffer, K. M. Woo, T. J. B. Collins, E. M. Campbell, and Y. Lawrence, “Mitigating Deceleration Rayleigh–Taylor Growth in Inertial Confinement Fusion Designs.”

X. Gong, D. N. Polsin, R. Paul, M. C. Marshall, M. K. Ginnane, B. J. Henderson, J. R. Rygg, G. W. Collins, and J. H. Eggert, “X-Ray Diffraction of Ramp-Compressed Silicon.”

V. Gopalaswamy, R. Betti, J. P. Knauer, D. Patel, A. Lees, K. M. Woo, C. A. Thomas, D. Cao, O. M. Mannion, R. C. Shah, C. J. Forrest, Z. L. Mohamed, C. Stoeckl, V. N. Glebov, S. P. Regan, D. H. Edgell, M. J. Rosenberg, I. V. Igumenshchev, P. B. Radha, K. S. Anderson, J. R. Davies, T. J. B. Collins, V. N. Goncharov, K. Churnetski, W. Theobald, E. M. Campbell, R. T. Janezic, D. R. Harding, M. J. Bonino, S. Sampat, K. A. Bauer, S. F. B. Morse, M. Gatu Johnson, R. D. Petrasso, C. K. Li, and J. A. Frenje, “Advances Toward Hydro-Equivalent Ignition in OMEGA Direct-Drive Implosions” (invited).

D. Haberberger, A. Shvydky, S. T. Ivancic, V. N. Goncharov, C. Stoeckl, and D. H. Froula, “Schlieren Refraction Measurements of Implosion Density Profiles.”

E. C. Hansen, M. B. P. Adams, A. Armstrong, J. R. Davies, P. Farmakis, F. García-Rubio, Y. Lu, D. Michta, K. Moczulski, C. Ren, A. C. Reyes, A. Sefkow, H. Wen, P. Tzeferacos, S. Langendorf, P. Ney, H. Rahman, and E. Ruskov, “Extended Magnetohydrodynamics in the *FLASH* Code.”

B. J. Henderson, M. C. Marshall, J. R. Rygg, D. N. Polsin, L. E. Hansen, M. K. Ginnane, and G. W. Collins, “Thermal Emission and Reflectivity of Shocked SiO<sub>2</sub> Aerogel for Broadband Optical Probing.”

P. V. Heuer, L. S. Leal, J. R. Davies, E. C. Hansen, D. H. Barnak, J. L. Peebles, and A. Birkel, “Proton Radiography of Self-Generated Magnetic Fields in Laser-Driven Cylindrical Implosions.”

P. V. Heuer, Y. Zhang, C. Ren, J. R. Davies, D. B. Schaeffer, M. S. Weidl, C. Niemann, W. Fox, and D. Caprioli, “Studying Quasi-Parallel Collisionless Shocks in the Laboratory.”

S. X. Hu, P. M. Nilson, D. T. Bishel, D. A. Chin, V. V. Karasiev, I. E. Golovkin, M. Gu, T. Walton, and S. B. Hansen, “Probing Extreme Atomic Physics at Petapascal Pressures.”

M. Huff, J. R. Rygg, G. W. Collins, T. R. Boehly, D. N. Polsin, M. Nakajima, B. J. Henderson, M. C. Marshall, T. A. Suer,

D. E. Fratanduono, M. Millot, R. F. Smith, C. A. McCoy, and L. E. Hansen, “Measurements of Sound Speed in Iron Shock-Compressed Iron to ~3000 GPa.”

I. V. Igumenshchev, V. N. Goncharov, E. M. Campbell, T. J. B. Collins, M. J. Rosenberg, N. Shaffer, W. Theobald, W. Trickey, R. C. Shah, A. Shvydky, A. Colaitis, S. Atzeni, and L. Savino, “Dynamic Shell Stability to Low-Mode Perturbations.”

S. T. Ivancic, W. Theobald, K. Churnetski, M. Michalko, R. Spielman, S. P. Regan, A. Raymond, J. D. Kilkenny, A. Carpenter, C. Trosseille, D. K. Bradley, J. D. Hares, A. K. L. Dymoke Bradshaw, G. Rochau, M. Sanchez, and D. Garand, “Design of the Third X-Ray Line of Sight for OMEGA.”

T. R. Joshi, R. C. Shah, W. Theobald, I. V. Igumenshchev, J. Baltazar, D. Cao, and S. P. Regan, “Analysis of Modulations Observed in X-Ray Self-Emission Images of OMEGA Direct-Drive Inertial Confinement Fusion Implosions.”

V. V. Karasiev, D. I. Mihaylov, S. X. Hu, S. B. Trickey, and J. W. Dufty, “Advancing the Accuracy of DFT Simulations for High-Energy-Density Plasmas by Developing Temperature-Dependent Exchange-Correlation Functionals” (invited).

J. Katz, A. L. Milder, D. Turnbull, S. T. Ivancic, D. H. Froula, M. Sherlock, P. Michel, L. Divol, D. Strozzi, and W. Rozmus, “Direct Measurements of Laser Absorption in Undersense Plasmas on OMEGA.”

A. Kish, J. G. Shaw, M. Lavell, A. Sexton, and A. B. Sefkow, “Software Architecture Design for Modular Multiphysics Simulations.”

J. P. Knauer, C. J. Forrest, Z. L. Mohamed, K. M. Woo, O. M. Mannion, I. V. Igumenshchev, R. Betti, V. Gopalaswamy, P. B. Radha, S. P. Regan, W. Theobald, M. Gatu Johnson, J. A. Frenje, A. J. Crilly, and B. D. Appelbe, “Effect of Mode-1 Perturbations on OMEGA Areal-Density Measurements.”

M. J. Lavell, J. G. Shaw, A. Kish, A. Sexton, A. Srinivasan, S. Sikorski, and A. B. Sefkow, “Coulomb Collision Models for PIC Simulations of Field Reversed Configurations and Beam-Plasma Interactions.”

Y. Lawrence, V. N. Goncharov, W. Trickey, I. V. Igumenshchev, K. Woo, and J. Carroll-Nellenback, “Deceleration Phase Rayleigh–Taylor Growth in Dynamic Shell ICF Designs.”

- Y. Lawrence, R. D. McBride, and A. B. Sefkow, "Transport Coefficient Sensitivities in a Semi-Analytic Model for MagLIF."
- L. S. Leal, J. L. Peebles, D. H. Barnak, J. R. Davies, A. V. Maximov, E. C. Hansen, P. V. Heuer, A. B. Sefkow, and R. Betti, "Simulations of Ti-Layered Magnetized Liner Inertial Fusion Implosions on OMEGA Investigating the Effect of Mix."
- A. Lees, D. Barnak, R. Betti, V. Gopalaswamy, A. Shvydky, and Z. K. Sprowal, "Measurements of Shock-Release Dynamics in Polystyrene Foils."
- Y. Lu, S. Feister, J. Meinecke, F. Miniati, G. Gregori, A. Bott, A. Reyes, E. C. Hansen, J. T. Laune, B. Reville, J. S. Ross, D. Q. Lamb, and P. Tzeferacos, "Numerical Modeling of Laser-Driven Plasma Experiments Aiming to Study Turbulent Dynamo and Thermal Conduction at the National Ignition Facility."
- O. M. Mannion, C. J. Forrest, V. Yu. Glebov, J. P. Knauer, P. W. McKenty, Z. L. Mohamed, S. P. Regan, C. Stoeckl, B. D. Appelbe, A. J. Crilly, W. T. Taitano, B. Keenan, P. Adrian, J. A. Frenje, N. Kabadi, and M. Gatu Johnson, "Fusion Neutron Energy Spectrum Measurements in Kinetic Plasmas."
- M. J.-E. Manuel, M. Ghosh, R. Jonnalagadda, F. N. Beg, M. B. Adams, P. Tzeferacos, C. M. Huntington, B. Remington, J. S. Ross, D. D. Ryutov, H. W. Sio, G. F. Swadling, S. Wilks, and H.-S. Park, "Experimental Evidence of Early-Time Linear-Saturation of the Ion-Weibel Instability in Counterstreaming Plasmas."
- J. A. Marozas, P. W. McKenty, T. J. B. Collins, M. J. Rosenberg, H. G. Rinderknecht, S. P. Regan, E. M. Campbell, C. B. Yeamans, B. E. Blue, L. Divol, G. E. Kemp, and H. D. Whitley, "National Ignition Facility Polar-Direct-Drive Exploding-Pusher Experiments—Improving Performance via Imprint Mitigation."
- A. V. Maximov, D. Turnbull, R. K. Follett, D. H. Edgell, J. G. Shaw, H. Wen, D. H. Froula, and J. P. Palastro, "Absorption of Laser Light by Coupling to Incoherent Plasma Waves at Quarter-Critical Density."
- P. W. McKenty, J. A. Marozas, T. J. B. Collins, M. J. Rosenberg, G. E. Kemp, C. B. Yeamans, and L. Divol, "Examining the Role of Cross-Beam Energy Transfer in NIF Direct-Drive Exploding-Pusher Experiments."
- B. McLellan, S. Zhang, and S. X. Hu, "Revealing the Atomic Motion Composing the B1–B2 Structural Transformation of MgO Under High Pressures."
- K. R. McMillen, M. V. Ambat, Z. Barfield, J. Pigeon, D. Haberberger, D. H. Froula, and J. L. Shaw, "Plasma Characterization for Raman Amplification."
- D. Michta, P. Tzeferacos, F. Graziani, and G. W. Hammett, "A Many-Body Extension to Madelung Quantum Hydrodynamics."
- D. I. Mihaylov, V. V. Karasiev, S. X. Hu, J. R. Rygg, V. N. Goncharov, and G. W. Collins, "Improved First-Principles Equation-of-State Table of Deuterium for High-Energy-Density Science Applications."
- A. L. Milder, J. Katz, J. P. Palastro, D. H. Edgell, A. M. Hansen, D. Turnbull, D. H. Froula, M. Sherlock, and W. Rozmus, "Measurements of the Return-Current Instability with Ion-Acoustic Thomson Scattering."
- S. C. Miller, V. N. Goncharov, T. J. B. Collins, and A. Shvydky, "Internal Perturbation Evolution and Amplification During the Early Phase of Inertial Confinement Fusion Implosions."
- K. Moczulski, A. Reyes, M. B. P. Adams, A. Armstrong, P. Farmakis, E. C. Hansen, Y. Lu, D. Michta, D. Lamb, and P. Tzeferacos, "Implementation and Verification of LC Circuit for Z-Pinch *FLASH* Simulations."
- Z. L. Mohamed, J. P. Knauer, A. Sorce, R. B. Brannon, R. T. Janezic, W. T. Shmayda, Y. H. Kim, K. Meaney, H. Geppert-Kleinrath, N. M. Hoffman, M. S. Rubery, A. B. Zylstra, and J. Jeet, "S-Factor Measurements for Gamma-Channel Fusion Reactions."
- K. L. Nguyen, L. Yin, B. J. Albright, A. M. Hansen, D. Turnbull, R. K. Follett, D. H. Froula, and J. P. Palastro, "Cross-Beam Energy Transfer Saturation by Ion-Trapping-Induced Detuning."
- K. Nichols, A. J. White, L. A. Collins, and S. X. Hu, "Investigating the Stopping Power of Warm Dense Plasmas Using Time-Dependent Mixed Density-Functional Theory."
- P. M. Nilson, F. J. Marshall, T. J. B. Collins, R. Epstein, D. T. Bishel, D. A. Chin, J. J. Ruby, J. Kendrick, D. Guy, S. T. Ivancic, C. Stoeckl, V. N. Goncharov, and D. H. Froula, "High-Resolution X-Ray Imaging of Shock-Driven Interface Instabilities."

R. W. Paddock, R. H. Scott, W. J. Garbett, B. M. Haines, A. B. Zylstra, T. J. B. Collins, R. S. Craxton, and P. A. Norreys, “A Pathway Toward Burning Plasmas Through Low-Convergence-Ratio Direct-Drive ICF Implosions.”

J. P. Palastro, P. Franke, D. H. Froula, L. Nguyen, D. Ramsey, and T. T. Simpson, “High Harmonic Generation Driven by a Flying Focus.”

H. Pantell, L. E. Hansen, G. Tabak, M. F. Huff, G. Bruhaug, J. R. Rygg, and G. W. Collins, “Isotope Effects on High-Pressure Water.”

D. Patel, R. Betti, C. Stoeckl, M. J. Rosenberg, V. Gopalaswamy, J. P. Knauer, S. P. Regan, W. Theobald, V. Yu. Glebov, and A. R. Christopherson, “Analysis of Hot-Electron Preheat of High-Performing OMEGA Cryogenic Implosions.”

J. L. Peebles, J. R. Davies, D. H. Barnak, P. V. Heuer, L. S. Leal, F. J. Marshall, V. Yu. Glebov, and R. Betti, “Measurements of Laser-Preheat-Induced Mix in Scaled Magnetized Liner Inertial Fusion (MagLIF) Implosions.”

D. N. Polsin, X. Gong, M. F. Huff, L. E. Hansen, B. J. Henderson, R. Paul, S. Burns, G. W. Collins, J. R. Rygg, A. Lazicki, F. Coppari, R. Smith, M. Millot, J. H. Eggert, M. I. McMahon, X. Wang, K. Hilleke, and E. Zurek, “Probing a New Regime of Extreme Chemistry at High-Energy-Density Conditions: Na as a Prototypical Example” (invited).

H. Poole, D. Cao, R. Epstein, I. Golovkin, T. Walton, S. X. Hu, M. Kasim, S. Vinko, J. R. Rygg, V. N. Goncharov, G. Gregori, and S. P. Regan, “A Feasibility Study of Using X-Ray Thomson Scattering to Diagnose the In-Flight Plasma Conditions of DT Cryogenic Implosions.”

P. B. Radha, C. Stoeckl, W. Theobald, M. J. Rosenberg, M. Porcelli, R. Betti, E. M. Campbell, D. H. Edgell, V. N. Goncharov, J. P. Knauer, S. P. Regan, A. Shvydky, and A. A. Solodov, “Validation of Energy Coupling Models from kJ to MJ Scale.”

D. Ramsey, P. Franke, D. H. Froula, T. T. Simpson, K. Weichman, J. P. Palastro, B. Malaca, M. Pardal, J. Vieira, A. Di Piazza, and M. Formanek, “Nonlinear Thomson Scattering with Ponderomotive Control.”

S. P. Regan, O. M. Mannion, C. J. Forrest, H. McClow, Z. L. Mohamed, A. Kalb, J. Kwiatkowski, J. P. Knauer, C. Stoeckl,

R. C. Shah, V. Yu. Glebov, W. Theobald, K. Churnetski, R. Betti, V. Gopalaswamy, H. G. Rinderknecht, I. V. Igumenshchev, P. B. Radha, V. N. Goncharov, D. H. Edgell, J. Katz, D. Turnbull, D. H. Froula, M. J. Bonino, D. R. Harding, C. M. Shulberg, R. W. Luo, M. Hoppe, A. Colaitis, and E. M. Campbell, “Systematic Trends of Hot-Spot Flow Velocity in Laser-Direct-Drive Implosions on OMEGA.”

C. Ren, H. Wen, E. C. Hansen, S. J. Langendorf, D. Michta, and P. Tzeferacos, “PIC Simulations of Colliding Plasma Jets in Plasma Liner Experiment.”

A. Reyes, M. B. P. Adams, A. Armstrong, K. Moczulski, P. Farmakis, E. C. Hansen, Y. Lu, D. Michta, P. Tzeferacos, J. Grove, and D. Q. Lamb, “Implementation of a 2-D Unsplit Volume of Fluid Interface—Capturing Method for Multifluid Compressible Flows in the *FLASH* Code.”

H. G. Rinderknecht, M. S. Wei, G. Bruhaug, K. Weichman, J. P. Palastro, J. D. Zuegel, A. Arefiev, T. Wang, T. Toncian, A. Laso Garcia, D. Doria, K. Spohr, H. J. Quevedo, T. Ditmire, J. Williams, A. Haid, and D. Stutman, “Relativistically Transparent Magnetic Filament: A Laser-Plasma Platform for Efficient Electron Acceleration and MeV Photon Radiation.”

M. J. Rosenberg, A. A. Solodov, A. R. Christopherson, R. Betti, P. B. Radha, C. Stoeckl, C. J. Forrest, V. Yu. Glebov, F. J. Marshall, S. P. Regan, T. J. B. Collins, D. H. Froula, J. P. Palastro, V. N. Goncharov, M. Hohenberger, B. Bachmann, G. N. Hall, P. Michel, and C. Krauland “Hot-Electron Preheat in Hydrodynamically Scaled Direct-Drive Implosions at the National Ignition Facility and OMEGA.”

J. R. Rygg, G. W. Collins, and P. M. Celliers, “Plasma Waves and the Compressibility of Warm Dense Hydrogen.”

M. J. Schmitt, B. S. Scheiner, D. Schmidt, L. Kot, B. Keenan, M. J. Rosenberg, P. W. McKenty, and R. S. Craxton, “Ablative Energetics of Large-Capsule, Low-Intensity Direct-Drive Implosions at the National Ignition Facility.”

A. K. Schwemlein, C. E. Fagan, W. T. Shmayda, M. Sharpe, C. Stoeckl, C. J. Forrest, S. P. Regan, and W. U. Schröder, “First Demonstration of a Triton Beam Using Target Normal Sheath Acceleration.”

A. B. Sefkow, J. G. Shaw, A. Kish, M. Lavell, R. Masti, A. Sexton, S. Borve, A. Bowman, M. Burns, J. Carroll-Nellenback, S. Cohen, J. R. Davies, S. Dwarkadas, E. Evans,



- R. K. Follett, M. Haddad, K. Hemsley, A. Kokash, Y. Lawrence, B. G. Logan, R. L. McCrory, A. Nahar, J. H. Nuckolls, S. Pai, A. Poudel, T. Seabourne, W. Scullin, S. Sikorski, A. Srinivasan, H. Stojkovic, A. Velberg, K. Yanik, and S. Zhai, "Overview of TriForce: Projects, Progress, and Plans."
- N. R. Shaffer, A. V. Maximov, V. N. Goncharov, and M. Sherlock, "Impact of Bandwidth on the Electron Distribution Functions of Laser-Produced Plasmas."
- R. C. Shah, D. Cao, R. Epstein, M. J. Rosenberg, W. Theobald, V. Gopalaswamy, R. Betti, S. P. Regan, P. Volegov, and B. Bachmann, "Mix, Temperature, and Compression of Statistical Model Optimized Cryogenic Implosions."
- J. L. Shaw, G. Bruhaug, M. Freeman, F. Merrill, V. Geppert-Kleinrath, and C. Wilde, "Electron Radiography Based on Electron Beams from Laser-Plasma Accelerators."
- A. Shvydki, J. L. Peebles, M. J. Rosenberg, A. V. Maximov, K. S. Anderson, V. N. Goncharov, J. A. Marozas, P. W. McKenty, P. B. Radha, S. P. Regan, T. C. Sangster, M. Hohenberger, J. M. Di Nicola, J. M. Koning, M. M. Marinak, L. Masse, M. Karasik, and L. Antonelli, "National Ignition Facility Planar Imprint Experiments."
- T. T. Simpson, D. Ramsey, P. Franke, M. V. Ambat, K. Weichman, D. Turnbull, D. H. Froula, and J. P. Palastro, "Spatiotemporal Control of Laser Intensity Through Cross-Phase Modulation."
- A. A. Solodov, M. J. Rosenberg, M. Stoeckl, R. Betti, W. Seka, R. Epstein, C. Stoeckl, R. K. Follett, P. B. Radha, S. P. Regan, D. H. Froula, J. P. Palastro, V. N. Goncharov, A. R. Christopherson, B. Bachmann, M. Hohenberger, P. Michel, and J. F. Myatt, "Hot-Electron Preheat and Mitigation in Polar-Direct-Drive Experiments at the National Ignition Facility."
- Z. K. Sprowal, L. E. Hansen, M. Zaghoo, J. R. Rygg, T. R. Boehly, D. N. Polsin, M. Huff, G. W. Collins, D. G. Hicks, and P. M. Celliers, "Accessing High Density States in  $D_2$  Using Double Shock."
- C. Stoeckl, W. Theobald, P. B. Radha, T. Filkins, and S. P. Regan, "Energy-Coupling Experiments Using Solid Spheres in the Polar-Direct-Drive Configuration on OMEGA."
- G. Tabak, M. A. Millot, S. Hamel, T. Ogawa, P. M. Celliers, D. E. Fratanduono, A. Lazicki, D. Swift, S. Brygoo, P. Loubeyre, T. R. Boehly, N. Dasenbrock-Gammon, R. Dias, L. E. Hansen, 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."
- W. Theobald, M. J. Rosenberg, P. B. Radha, S. P. Regan, C. Stoeckl, L. Ceurvorst, R. Betti, K. S. Anderson, J. A. Marozas, V. N. Goncharov, E. M. Campbell, C. M. Shuldberg, R. W. Luo, W. Sweet, D. N. Kaczala, B. Bachmann, T. Döppner, M. Hohenberger, R. Scott, and A. Colaitis, "Laser-Direct-Drive Energy Coupling at  $4 \times 10^{14}$  W/cm<sup>2</sup> to  $1.2 \times 10^{15}$  W/cm<sup>2</sup> from Spherical Solid-Plastic Implosions at the National Ignition Facility."
- C. A. Thomas, W. Theobald, J. P. Knauer, C. Stoeckl, T. J. B. Collins, V. N. Goncharov, R. Betti, E. M. Campbell, K. S. Anderson, K. A. Bauer, D. Cao, R. S. Craxton, D. H. Edgell, R. Epstein, C. J. Forrest, V. Yu. Glebov, V. Gopalaswamy, I. V. Igumenshchev, S. T. Ivancic, D. W. Jacobs-Perkins, R. T. Janezic, T. Joshi, J. Kwiatkowski, A. Lees, F. J. Marshall, M. Michalko, Z. L. Mohamed, D. Patel, J. L. Peebles, P. B. Radha, S. P. Regan, H. G. Rinderknecht, M. J. Rosenberg, S. Sampat, T. C. Sangster, R. C. Shah, K. L. Baker, A. L. Kritcher, M. Tabak, M. C. Herrmann, A. R. Christopherson, and O. M. Mannion, "Laser-Direct-Drive Cryogenic Implosion Performance on OMEGA Versus Target and Laser-Spot Radius."
- W. Trickey, V. N. Goncharov, E. M. Campbell, T. J. B. Collins, M. J. Rosenberg, N. Shaffer, W. Theobald, R. C. Shah, A. Shvydki, I. V. Igumenshchev, A. Colaitis, S. Atzeni, and L. Savino, "Optimization of Beam-Port Configurations to Minimize Low-Mode Perturbations in High-Yield Inertial Confinement Fusion Targets."
- W. Trickey, R. H. H. Scott, and N. Woolsey, "Shock-Augmented Ignition Using Indirect Drive."
- P. Tzeferacos, A. Reyes, Y. Lu, A. Armstrong, K. Moczulski, G. Gregori, J. Meinecke, H. Poole, L. Chen, T. Campbell, A. Bell, S. Sarkar, F. Miniati, A. Schekochihin, D. Lamb, D. H. Froula, J. Katz, D. Haberberger, D. Turnbull, S. Fess, H.-S. Park, J. S. Ross, T. Doepfner, J. Emig, C. Goyon, D. Ryutov, B. Remington, A. Zylstra, C.-K. Li, A. Birkel, R. D. Petrasso, H. Sio, F. H. Séguin, A. F. A. Bott, C. Palmer, B. Khair, S. Feister, A. Casner, D. Ryu, B. Reville, C. J. Forrest, J. Foster, Y. Sakawa, F. Fiuza, E. Churazov, R. Bingham, T. White, and E. Zweibel, "Strong Suppression of Heat Conduction in Laser-Driven Magnetized Turbulent Plasmas."

M. VanDusen-Gross, K. Weichman, D. R. Harding, A. Arefiev, J. Williams, A. Haid, and H. G. Rinderknecht, “Design of Experiments to Study Relativistically Transparent Magnetic Filaments Using OMEGA EP.”

K. Weichman, A. V. Arefiev, H. Mao, F. N. Beg, J. P. Palastro, A. P. L. Robinson, M. Murakami, S. Fujioka, J. J. Santos, T. Toncian, T. Ditmire, H. Quevedo, Y. Shi, and V. V. Ivanov, “Effects of KiloTesla-Level Applied Magnetic Fields on Relativistic Laser–Plasma Interactions” (invited).

H. Wen, R. K. Follett, A. V. Maximov, and J. P. Palastro, “Mitigation of Inflationary Stimulated Raman Scattering with Laser Bandwidth.”

C. A. Williams, R. Betti, V. Gopalaswamy, A. Lees, J. P. Knauer, C. J. Forrest, D. Patel, S. Sampat, R. T. Janezic, D. Cao, O. M. Mannion, P. B. Radha, S. P. Regan, R. C. Shah, C. A. Thomas, W. Theobald, and K. M. Woo, “Improving Performance and Understanding of Direct-Drive Inertial Fusion Implosions Using Statistical Modeling of Experimental Data.”

K. M. Woo, R. Betti, C. A. Thomas, C. Stoeckl, K. Churnetski, C. J. Forrest, Z. L. Mohamed, B. Zirps, S. P. Regan, T. J. B. Collins, W. Theobald, R. C. Shah, O. M. Mannion, D. Patel, D. Cao, J. P. Knauer, V. N. Goncharov, P. B. Radha, H. G. Rinderknecht, R. Epstein, V. Gopalaswamy, and F. J. Marshall, “Three-Dimensional Hot-Spot Reconstruction in Inertial Fusion Implosions.”

S. Zhang, M. C. Marshall, J. R. Rygg, A. Shvydky, D. Haberberger, V. N. Goncharov, T. R. Boehly, G. W. Collins, S. X. Hu, D. E. Fratanduono, and A. Lazicki, “Species Separation in Polystyrene Shock Release Evidenced by Molecular-Dynamics Simulations and Laser-Drive Experiments.”

Y. Zhang, P. V. Heuer, J. R. Davies, and C. Ren, “Magnetized Collisionless Shock Formation Mediated by the Modified-Two-Stream Instability.”

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D. E. Keller and V. V. Karasiev, “VASP 6.2.1 Runtime Comparison for Extreme Thermodynamic Condition Simulations Using Graphics-Processing Units,” presented at the 12th IEEE Workshop on Performance Modeling, Benchmarking, and Simulation of High-Performance Computer Systems, virtual, 14–19 November 2021.

C. Deeney, “The Laboratory for Laser Energetics: An Overview,” presented at the L3Harris visit, Rochester, NY, 15 November 2021.

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E. M. Campbell, “Inertial Fusion Energy: Opportunities and Challenges,” presented at the Inertial Fusion Energy Workshop, Livermore, CA, 16 November 2021.

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C. Deeney, “The Laboratory for Laser Energetics: An Overview,” presented at the Danny Lowe visit, Rochester, NY, 16 November 2021.

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The following presentations were made at the OES Annual Meeting, virtual, 17–18 November 2021:

E. M. Campbell, “ICF-Facility Operations LLE 10.7.”

S. P. Regan, “ICF Diagnostics and Instrumentation: LLE.”

T. C. Sangster, “MTE 10.8.”

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M. Wang and D. R. Harding, “Mechanical Properties of Micrometer-Size Foam-Like Auxetic Structures,” presented at the MRS Fall Meeting, Boston, MA, 28 November–3 December 2021.

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E. M. Campbell, “Principles of Inertial Confinement Fusion,” presented at the NROTC visit, Rochester, NY, 1 December 2021.

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The following presentations were made at the Cooperative Agreement Review Meeting, Rochester, NY, 6–7 December 2021:

E. M. Campbell, “The Laboratory for Laser Energetics: An Overview of the FY19–FY23 Cooperative Agreement.”

G. W. Collins, “HEDS Curriculum and Mentoring at the University of Rochester.”

G. W. Collins, S. X. Hu, and J. R. Rygg, “Laboratory for Laser Energetics Contributions to the Stockpile Stewardship Mission.”

C. Deeney and E. M. Campbell, “The Laboratory for Laser Energetics: Our Cooperative Agreement Going Forward.”

V. N. Goncharov, “Review of Ignition Science Campaigns.”

V. Gopalaswamy, R. Betti, J. P. Knauer, D. Patel, A. Lees, K. M. Woo, C. A. Thomas, D. Cao, O. M. Mannion, R. C. Shah, C. J. Forrest, Z. L. Mohamed, C. Stoeckl, V. Yu. Glebov, S. P. Regan, D. H. Edgell, M. J. Rosenberg, I. V. Igumenshchev, P. B. Radha, K. S. Anderson, J. R. Davies, T. J. B. Collins, V. N. Goncharov, E. M. Campbell, R. T. Janezic, D. R. Harding, M. J. Bonino, S. Sampat, K. A. Bauer, S. F. B. Morse, M. Gatu Johnson, R. D. Petrasso, C. K. Li, and J. A. Frenje, “OMEGA DT Cryogenic Implosion Progress.”

D. R. Harding, A. Behlok, M. J. Bonino, T. Cracium, S. Fess, J. Fooks, S. Karim, I. Knudsen, K. Lintz, N. Redden, D. Wasilewski, M. Wittman, Y. Lu, P. Fan, and X. Huang, “Target Production and Development at LLE.”

S. X. Hu, “Highlights of Recent Progress in High-Energy-Density Physics Theory/Computation at LLE.”

S. F. B. Morse, “Omega Facility Performance FY19–FY23.”

S. P. Regan, “DOE Cooperative FY19–FY23 Agreement: Diagnostic Development (10.3).”

J. R. Rygg, D. N. Polsin, X. Gong, M. C. Marshall, G. W. Collins, J.-P. Davis, C. McCoy, C. Seagle, A. Lazicki, R. Kraus, J. H. Eggert, and D. E. Fratanduono, “High-Energy-Density Experiments: Case Studies.”

C. Sorce, “Engineering, Information Technology and Cybersecurity, and Safety.”

S. Stagnitto, “University of Rochester Support of the Laboratory for Laser Energetics’ Research Portfolio.”

D. Turnbull, “Laser–Plasma Instabilities: Deep Dive.”

M. S. Wei, “Education and User Access.”

J. D. Zuegel, “Laser and Materials Technology Division and Major Projects.”

The following presentations were made at the National Diagnostic Workshop, virtual, 7–9 December 2021:

S. T. Ivancic, W. Theobald, K. Churnetski, M. Michalko, R. Spielman, S. P. Regan, A. Raymond, J. D. Kilkenny, A. Carpenter, C. Trosseille, D. K. Bradley, J. D. Hares, A. K. L. Dymoke-Bradshaw, G. Rochau, M. Sanchez, and D. Garand, “Design of the Third X-Ray Line of Sight for OMEGA.”

A. L. Milder, J. Katz, R. Boni, D. Nelson, J. P. Palastro, P. Franke, J. L. Shaw, S. T. Ivancic, A. M. Hansen, D. Turnbull, I. A. Begishev, K. Daub, Z. Barfield, R. K. Follett, D. H. Froula, M. Sherlock, H. P. Le, T. Chapman, and W. Rozmus, “Measurements of Non-Maxwellian Electron Distribution Functions Using Angularly Resolved Thomson Scattering.”

J. P. Palastro, P. Franke, M. Lim Pac Chong, K. L. Nguyen, J. Pigeon, D. Ramsey, H. G. Rinderknecht, J. L. Shaw, T. T. Simpson, D. Turnbull, K. Weichman, D. H. Froula, M. Formanek, A. Di Piazza, B. Malaca, M. Pardal, and J. Vieira, “Advanced Radiation Sources Enabled by Spatiotemporal Control of Laser Intensity.”

J. L. Peebles, “Magnetized Target Capabilities and Diagnostic Needs at LLE.”

H. G. Rinderknecht, J. P. Knauer, W. Theobald, R. Fairbanks, B. Brannon, V. Kobilansky, R. Peck, J. Armstrong, M. Weisbeck, J. Brown, P. B. Radha, S. P. Regan, J. Kunimune, P. Adrian, M. Gatu Johnson, J. A. Frenje, F. H. Séguin, and B. Bachmann, “An Introduction to Knock-on Deuteron Imaging for Diagnosing the Fuel and Hot Spot in Direct-Drive ICF Implosions.”

The following presentations were made at the 2021 IEEE Pulsed Power Conference and Symposium on Fusion Engineering, Denver, CO, 12–16 December 2021:

M. Sharpe, W. T. Shmayda, and J. J. Ruby, “Influence of Heat Treatments on the Near-Surface Tritium Concentration Profiles.”

W. T. Shmayda, H. Mutha, and K. Ryan, “Tritium Recovery from SPARC.”

C. A. Thomas, E. M. Campbell, and M. Tabak, “Review of Inertial Confinement Fusion: Physics and Engineering Challenges” (invited).

The following presentations were made at the American Geophysical Union Fall Meeting, New Orleans, LA, 13–17 December 2021:

M. Ghosh, S. Zhang, and S. X. Hu, “Mechanism of Cooperative Diffusion in bcc Iron Under Earth and Super-Earth’s Inner Core Conditions.”

R. Paul, K. Nichols, S. Zhang, S. X. Hu, and V. V. Karasiev, “Melting, Acoustic Properties, and Thermal Conditions of FeO<sub>2</sub> Near Core–Mantle Boundary Conditions.”

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E. M. Campbell, “ICF Research at the University of Rochester’s Laboratory for Laser Energetics,” presented at

the 42nd Annual Meeting of Fusion Power Associates, virtual, 15–16 December 2021.

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E. M. Campbell, “University of Rochester and the Laboratory for Laser Energetics: An Overview,” presented at the 3rd INFUSE Workshop, virtual, 16–17 December 2021.

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R. Betti, “Thermonuclear Ignition in Laser-Driven Inertial Confinement Fusion,” presented at the Centro Ricerche Frascati, Frascati, Italy, 17 December 2021.