
Publications and Conference Presentations

Publications

- F. Albert, N. Lemos, J. L. Shaw, P. M. King, B. B. Pollock, C. Goyon, W. Schumaker, A. M. Saunders, K. A. Marsh, A. Pak, J. E. Ralph, J. L. Martins, L. D. Amorim, R. W. Falcone, S. H. Glenzer, J. D. Moody, and C. Joshi, “Betatron X-Ray Radiation from Laser-Plasma Accelerators Driven by Femtosecond and Picosecond Laser Systems,” *Phys. Plasmas* **25**, 056706 (2018).
- P. M. Celliers, M. Millot, S. Brygoo, R. S. McWilliams, D. E. Fratanduono, J. R. Rygg, A. F. Goncharov, P. Loubeyre, J. H. Eggert, J. L. Peterson, N. B. Meezan, S. Le Pape, G. W. Collins, R. Jeanloz, and R. J. Hemley, “Insulator-Metal Transition in Dense Fluid Deuterium,” *Science* **361**, 677–682 (2018).
- A. R. Christopherson, R. Betti, J. Howard, K. M. Woo, A. Bose, E. M. Campbell, and V. Gopalaswamy, “Theory of Alpha Heating in Inertial Fusion: Alpha-Heating Metrics and the Onset of the Burning-Plasma Regime,” *Phys. Plasmas* **25**, 072704 (2018).
- A. Colaitis, J.-E. Ducret, M. Le Pennec, X. Ribeyre, and S. Turck-Chièze, “Towards a Novel Stellar Opacity Measurement Scheme Using Stability Properties of Double Ablation Front Structures,” *Phys. Plasmas* **25**, 072707 (2018).
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- C. Dorrer, A. Kalb, P. Fiala, S.-W. Bahk, A. Sharma, and K. Gibney, “Investigation of an Apodized Imaged Hartmann Wavefront Sensor,” *Appl. Opt.* **57**, 7266–7275 (2018).
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- C. L. Ellison, H. D. Whitley, C. R. D. Brown, S. R. Copeland, W. J. Garbett, H. P. Le, M. B. Schneider, Z. B. Walters, H. Chen, J. I. Castor, R. S. Craxton, M. Gatu Johnson, E. M. Garcia, F. R. Graziani, G. E. Kemp, C. M. Krauland, P. W. McKenty, B. Lahmann, J. E. Pino, M. S. Rubery, H. A. Scott, R. Shepherd, and H. Sio, “Development and Modeling of a Polar-Direct-Drive Exploding Pusher Platform at the National Ignition Facility,” *Phys. Plasmas* **25**, 072710 (2018).
- J. A. Gaffney, S. X. Hu, P. Arnault, A. Becker, L. X. Benedict, T. R. Boehly, P. M. Celliers, D. M. Ceperley, O. Čertík, J. Clérrouin, G. W. Collins, L. A. Collins, J.-F. Danel, N. Desbiens, M. W. C. Dharma-wardana, Y. H. Ding, A. Fernandez-Pañella, M. C. Gregor, P. E. Grabowski, S. Hamel, S. B. Hansen, L. Harbour, X. T. He, D. D. Johnson, W. Kang, V. V. Karasiev, L. Kazandjian, M. D. Knudson, T. Ogitsu, C. Pierleoni, R. Piron, R. Redmer, G. Robert, D. Saumon, A. Shamp, T. Sjostrom, A. V. Smirnov, C. E. Starrett, P. A. Sterne, A. Wardlow, H. D. Whitley, B. Wilson, P. Zhang, and E. Zurek, “A Review of Equation-of-State Models for Inertial Confinement Fusion Materials,” *High Energy Density Phys.* **28**, 7–24 (2018).
- M. Gatu Johnson, C. J. Forrest, D. B. Sayre, A. Bacher, J.-L. Bourgade, C. R. Brune, J. A. Caggiano, D. T. Casey, J. A. Frenje, V. Yu. Glebov, G. M. Hale, R. Hatarik, H. W. Herrmann, R. Janezic, Y. H. Kim, J. P. Knauer, O. Landoas, D. P. McNabb, M. W. Paris, R. D. Petrasso, J. E. Pino, S. Quagliioni, B. Rosse, J. Sanchez, T. C. Sangster, H. Sio, W. Shmayda, C. Stoeckl, I. Thompson, and A. B. Zylstra, “Experimental Evidence of a Variant Neutron Spectrum from the $T(t,2n)\alpha$ Reaction at Center-of-Mass Energies in the Range of 16–50 keV,” *Phys. Rev. Lett.* **121**, 042501 (2018).
- S. M. Gracewski, S. Boylan, J. C. Lambropoulos, J. B. Oliver, T. J. Kessler, and S. G. Demos, “Simulation of Internal Stress Waves Generated by Laser-Induced Damage in Multilayer Dielectric Gratings,” *Opt. Express* **26**, 18,412–18,422 (2018).
- W. Grimble, F. J. Marshall, and E. Lambrides, “Measurement of Cryogenic Target Position and Implosion Core Offsets on OMEGA,” *Phys. Plasmas* **25**, 072702 (2018).

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- S. X. Hu, W. Theobald, P. B. Radha, J. L. Peebles, S. P. Regan, A. Nikroo, M. J. Bonino, D. R. Harding, V. N. Goncharov, N. Petta, T. C. Sangster, and E. M. Campbell, "Mitigating Laser-Imprint Effects in Direct-Drive Inertial Confinement Fusion Implosions with an Above-Critical-Density Foam Layer," *Phys. Plasmas* **25**, 082710 (2018).
- C. Z. R. Huang, R. W. Wood, and S. G. Demos, "Adaptation of Microscopy with Ultraviolet Surface Excitation for Enhancing STEM and Undergraduate Education," *J. Biomed. Opt.* **23**, 121603 (2018).
- P. A. Keiter, R. VanDervort, G. Cearley, E. Johnsen, and R. P. Drake, "Experimental Considerations to Observe Two Ionizing Fronts in Systems with a Sharp Absorption Edge," *Rev. Sci. Instrum.* **89**, 10G104 (2018).
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- J. Matteucci, W. Fox, A. Bhattacharjee, D. B. Schaeffer, C. Moissard, K. Germaschewski, G. Fiksel, and S. X. Hu, "Biermann-Battery-Mediated Magnetic Reconnection in 3D Colliding Plasmas," *Phys. Rev. Lett.* **121**, 095001 (2018).
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- R. VanDervort, M. Trantham, S. Klein, C. Sorce, P. A. Keiter, and R. P. Drake, "Development of a Backlit-Multi-Pinhole Radiography Source," *Rev. Sci. Instrum.* **89**, 10G110 (2018).
- R. Xin and J. D. Zuegel, "Chirped-Pulse-Amplification Seed Source Through Direct Phase Modulation," *Opt. Express* **26**, 21,332–21,345 (2018).
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Y. Zhao and W. R. Donaldson, "Response Analysis on AlGaN Metal–Semiconductor–Metal Photodetectors in a Perspective of Experiment and Theory and the Persistent Photoconductivity Effect," *J. Mater. Res.* **33**, 2627–2636 (2018) (invited).

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Forthcoming Publications

R. Aboushelbaya, A. F. Savin, L. Ceurvorst, J. Sadler, P. A. Norreys, A. S. Davies, D. H. Froula, A. Boyle, M. Galimberti, P. Oliveira, B. Parry, Y. Katzir, and K. Glize, "Single-Shot Frequency-Resolved Optical Gating for Retrieving the Pulse Shape of High Energy Picosecond Pulses," to be published in *Review of Scientific Instruments*.

C. Dorrer and S.-W. Bahk, "Spatiospectral Characterization of Broadband Fields Using Multispectral Imaging," to be published in *Optics Express*.

F. Albert, N. Lemos, J. L. Shaw, P. M. King, B. B. Pollock, C. Goyon, W. Schumaker, A. M. Saunders, K. A. Marsh, A. Pak, J. E. Ralph, J. L. Martins, L. D. Amorim, R. W. Falcone, S. H. Glenzer, J. D. Moody, and C. Joshi, "Betatron X-Ray Radiation in the Self-Modulated Laser Wakefield Acceleration Regime: Prospects for a Novel Probe at Large Scale Laser Facilities," to be published in *Nuclear Fusion*.

C. Dorrer and R. J. Brown, "Stable, Low-Repetition-Rate Time-Lens Picosecond Seed Source," to be published in *IEEE Photonics Technology Letters*.

C. Dorrer and J. Qiao, "Direct Binary Search for Improved Coherent Beam Shaping and Optical Differentiation Wavefront Sensing," to be published in *Applied Optics*.

H. Aluie, "Convolutions on the Sphere: Commutation with Differential Operators," to be published in *GEM: International Journal on Geomathematics*.

R. P. Drake and F. W. Doss, "Regimes of the Vishniac–Ryu Decelerating Shock Instability," to be published in the *Astrophysical Journal*.

L. Berzak Hopkins, S. LePape, L. Divol, A. Pak, E. Dewald, D. D. Ho, N. Meezan, S. Bhandarkar, L. R. Benedetti, T. Bunn, J. Biener, J. Crippen, D. Casey, D. Clark, D. Edgell, D. Fittinghoff, M. Gatu-Johnson, C. Goyon, S. Haan, R. Hatarik, M. Havre, D. Hinkel, H. Huang, N. Izumi, J. Jaquez, O. Jones, S. Khan, A. Kritcher, C. Kong, G. Kyrala, O. Landen, T. Ma, A. MacPhee, B. MacGowan, A. J. Mackinnon, M. Marinak, J. Milovich, M. Millot, P. Michel, A. Moore, S. R. Nagel, A. Nikroo, P. Patel, J. Ralph, H. Robey, J. S. Ross, N. G. Rice, S. Sepke, V. A. Smalyuk, P. Sterne, D. Strozzi, M. Stadermann, P. Volegov, C. Weber, C. Wild, C. Yeamans, D. Callahan, O. Hurricane, R. P. J. Town, and M. J. Edwards, "Toward a Burning-Plasma State Using Diamond Ablator Inertially Confined Fusion Implosions at the National Ignition Facility," to be published in *Plasma Physics and Controlled Fusion*.

K. Engelhorn, T. J. Hilsabeck, J. Kilkenny, D. Morris, T. M. Chung, A. Dymoke-Bradshaw, J. D. Hares, P. Bell, D. Bradley, A. C. Carpenter, M. Dayton, S. R. Nagel, L. Claus, J. Porter, G. Rochau, M. Sanchez, S. Ivancic, C. Sorce, and W. Theobald, "Subnanosecond Single Line-of-Sight X-Ray Imagers," to be published in *Review of Scientific Instruments* (invited).

R. K. Follett, J. G. Shaw, J. F. Myatt, V. N. Goncharov, D. H. Edgell, D. H. Froula, and J. P. Palastro, "Ray-Based Modeling of Cross-Beam Energy Transfer at Caustics," to be published in *Physical Review E*.

W. Fox, J. Matteucci, C. Moissard, D. B. Schaeffer, A. Bhattacharjee, K. Germaschewski, and S. X. Hu, "Kinetic Simulation of Magnetic Field Generation and Collisionless Shock Formation in Expanding Laboratory Plasmas," to be published in *Physics of Plasmas*.

Y. H. Ding, A. J. White, S. X. Hu, O. Čertik, and L. A. Collins, "Ab Initio Studies on the Stopping Power of Warm Dense Matter with Time-Dependent Orbital-Free Density Functional Theory," to be published in *Physical Review Letters*.

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M. Gatu Johnson, J. Katz, C. Forrest, J. A. Frenje, V. Yu. Glebov, C. K. Li, R. Paguio, C. E. Parker, C. Robillard, T. C. Sangster, M. Schoff, F. H. Seguin, C. Stoeckl, and R. D. Petrasso, "Measurement of Apparent Ion Temperature Using the Magnetic Recoil Spectrometer at the Omega Laser Facility," to be published in *Review of Scientific Instruments*.

V. Yu. Glebov, M. J. Eckart, C. J. Forrest, G. P. Grim, E. P. Hartouni, R. Hatarik, J. P. Knauer, A. S. Moore, S. P. Regan, T. C. Sangster, D. J. Schlossberg, and C. Stoeckl, "Testing a Cherenkov Neutron Time-of-Flight Detector on OMEGA," to be published in *Review of Scientific Instruments*.

M. G. Gorman, A. L. Coleman, R. Briggs, R. S. McWilliams, D. McGonegle, C. A. Bolme, A. E. Gleason, E. Galtier, H. J. Lee, E. Granados, M. Śliwa, C. Sanloup, S. Rothman, D. E. Fratanduono, R. F. Smith, G. W. Collins, J. H. Eggert, J. S. Wark, and M. I. McMahan, "Femtosecond Diffraction Studies of Solid and Liquid Phase Changes in Shock-Compressed Bismuth," to be published in *Scientific Reports*.

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E. C. Hansen, P. Hartigan, A. Frank, A. Wright, and J. C. Raymond, "Simulating Radiative Magnetohydrodynamical Flows with *ASTROBEAR*: Implementation and Applications of Nonequilibrium Cooling," to be published in *Monthly Notices of the Royal Astronomical Society*.

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S. X. Hu, V. N. Goncharov, P. B. Radha, S. P. Regan, and E. M. Campbell, "Microphysics Studies for Direct-Drive Inertial Confinement Fusion," to be published in *Nuclear Fusion*.

G. Kagan, O. L. Landen, D. Svyatskiy, H. Sio, N. V. Kabadi, R. A. Simpson, M. Gatu Johnson, J. A. Frenje, R. D. Petrasso, R. C. Shah, T. R. Joshi, P. Hakel, T. E. Weber, H. G. Rinderknecht, D. Thorn, M. Schneider, D. Bradley, and J. Kilkenny, "Inference of the Electron Temperature in Inertial Confinement Fusion Implosions from the Hard X-Ray Spectral Continuum," to be published in *Contributions to Plasma Physics*.

A. A. Kozlov, J. C. Lambropoulos, J. B. Oliver, B. N. Hoffman, and S. G. Demos, "Mechanisms of Picosecond Laser-Induced Damage in Multilayer Dielectric Coatings," to be published in *Scientific Reports*.

A. Krygier, F. Coppari, G. E. Kemp, D. B. Thorn, R. S. Craxton, J. H. Eggert, E. M. Garcia, J. M. McNaney, H.-S. Park, Y. Ping, B. A. Remington, and M. B. Schneider, "Developing a High-Flux, High-Energy Continuum Backlighter for Extended X-Ray Absorption Fine Structure Measurements at the National Ignition Facility," to be published in *Review of Scientific Instruments*.

G. A. Kyrala, J. E. Pino, S. F. Khan, S. A. MacLaren, J. D. Salmonson, T. Ma, L. Masse, R. Tipton, P. A. Bradley, J. R. Rygg, J. E. Field, R. Tommasini, J. E. Ralph, D. P. Turnbull, A. J. Mackinnon, L. R. Benedetti, D. K. Bradley, S. Nagel, P. M. Celliers, E. Dewald, T. R. Dittrich, L. Berzak Hopkins, N. Izumi, M. L. Kervin, J. Kline, C. Yeamans, R. Hatarik, D. Sayre, E. P. Hartouni, A. Pak, K. C. Chen, and D. E. Hoover, "Using a Two-Shock 1-D Platform on the NIF to Measure the Effect of Convergence on Mix and Symmetry," to be published in *Physics of Plasmas*.

T.-G. Lee, M. Busquet, M. Klapisch, J. W. Bates, A. J. Schmitt, S. X. Hu, and J. Giuliani, "Radiative and Atomic Properties of C and CH Plasmas in the Warm-Dense-Matter Regime," to be published in *Physical Review E*.

O. M. Mannion, V. Yu. Glebov, C. J. Forrest, J. P. Knauer, V. N. Goncharov, S. P. Regan, T. C. Sangster, C. Stoeckl, and M. Gatu Johnson, "Calibration of a Neutron Time-of-Flight Detector with a Rapid Instrument Response Function for Measurements

of Bulk Fluid Motion on OMEGA,” to be published in Review of Scientific Instruments.

A. Pak, S. Kerr, N. Lemos, A. Link, P. Patel, F. Albert, L. Divol, B. B. Pollock, D. Haberberger, D. Froula, M. Gauthier, S. H. Glenzer, A. Longman, L. Manzoor, R. Fedosejevs, S. Tochitsky, C. Joshi, and F. Fiuza, “Collisionless Shock Acceleration of Narrow Energy Spread Ion Beams from Mixed Species Plasmas Using 1- μm Lasers,” to be published in Physical Review Accelerators and Beams.

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N. R. Pereira, A. T. Macrander, C. Stoeckl, and E. O. Baronova, “On Evaluating X-Ray Imaging Crystals with Synchrotron Radiation,” to be published in Review of Scientific Instruments.

K. Prestridge, “Experimental Adventures in Variable-Density Mixing,” to be published in Physical Review Fluids.

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M. J. Rosenberg, R. Epstein, A. A. Solodov, S. P. Regan, W. Seka, J. F. Myatt, P. A. Michel, M. A. Barrios, D. B. Thorn, M. Hohenberger, and J. D. Moody, “X-Ray Spectroscopy of Planar Laser-Plasma Interaction Experiments at the National Ignition Facility,” to be published in Physics of Plasmas.

S. Sampat, T. Z. Kosc, K. A. Bauer, M. H. Romanofsky, A. L. Rigatti, J. Kwiatkowski, R. D. Dean, W. R. Donaldson, L. J. Waxer, R. Moshier, and J. H. Kelly, “Power Balancing the Multibeam OMEGA Laser,” to be published in Applied Optics.

E. M. Schiesser, S.-W. Bahk, J. Bromage, and J. P. Rolland, “Gaussian Curvature and Stigmatic Imaging Relations for the Design of an Unobscured Reflective Relay,” to be published in Optics Letters.

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

C. Stoeckl, T. Filkins, R. K. Jungquist, C. Mileham, S. P. Regan, M. J. Shoup III, and W. Theobald, “Characterization of Shaped Bragg Crystal Assemblies for Narrowband X-Ray Imaging,” to be published in Review of Scientific Instruments.

J. D. Styron, C. L. Ruiz, K. D. Hahn, G. W. Cooper, G. A. Chandler, B. Jones, B. R. McWatters, C. J. Forrest, J. Vaughan, J. Torres, S. Pelka, J. Smith, and C. Weaver, “Average Neutron Time-of-Flight Instrument Response Function Inferred from Single D-T Neutron Events Within a Plastic Scintillator,” to be published in Review of Scientific Instruments.

W. Theobald, C. Sorce, M. Bedzyk, S. T. Ivancic, F. J. Marshall, C. Stoeckl, R. C. Shah, M. Lawrie, S. P. Regan, T. C. Sangster, E. M. Campbell, T. J. Hilsabeck, K. Engelhorn, J. D. Kilkenny, D. Morris, 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, 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 Diagnostic on OMEGA,” to be published in Review of Scientific Instruments.

D. B. Thorn, F. Coppari, T. Döppner, M. J. MacDonald, S. P. Regan, and M. B. Schneider, “X-Ray Spectrometer Throughput Model for (Selected) Flat Bragg Crystal Spectrometers on Laser-Plasma Facilities,” to be published in Review of Scientific Instruments.

D. Turnbull, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, A. S. Davies, P. Franke, D. Haberberger, J. Katz, T. J. Kessler, A. L. Milder, J. P. Palastro, J. L. Shaw, D. H. Froula, N. Vafaei-Najafabadi, J. Vieira, and F. Quéré, “Flying Focus and Its Application to Plasma-Based Laser Amplifiers,” to be published in *Plasma Physics and Controlled Fusion*.

M. P. Valdivia, F. Veloso, D. Stutman, C. Stoeckl, C. Mileham, I. A. Begishev, W. Theobald, M. Vescovi, W. Useche, S. P. Regan, B. Albertazzi, G. Rigon, P. Mabey, T. Michel, S. A. Pikuz, M. Koenig, and A. Casner, “X-Ray Backlighter Requirements for Refraction-Based Electron Density Diagnostics Through Talbot–Lau Deflectometry,” to be published in *Review of Scientific Instruments*.

A. J. White, O. Certik, Y. H. Ding, S. X. Hu, and L. A. Collins, “Time-Dependent Orbital-Free Density Functional Theory for Electronic Stopping Power: Comparison to the Mermin–Kohn–Sham Theory at High Temperatures,” to be published in *Physical Review B*.

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

R. P. Young, C. C. Kuranz, R. P. Drake, D. H. Froula, J. S. Ross, and S. Klein, “Observation of Collisionless-to-Collisional Transition in Colliding Plasma Jets with Optical Thomson Scattering,” to be published in *Physics of Plasmas*.

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

Conference Presentations

The following presentations were made at the 45th EPS Conference on Plasma Physics, Prague, Czech Republic, 2–6 July 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, D. T. Michel, C. J. Forrest, R. C. Shah, P. B. Radha, V. N. Goncharov, 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. Gatju Johnson, J. A. Frenje, C. K. Li, R. D. Petrasso, and O. A. Hurricane, “Progress in Inertial Confinement Fusion via Lasers: How Close to Ignition and Burn?”

R. K. Follett, J. G. Shaw, J. F. Myatt, D. H. Froula, R. W. Short, and J. P. Palastro, “Suppressing Two-Plasmon Decay with Laser Frequency Detuning.”

R. C. Shah, D. T. Michel, I. V. Igumenshchev, K. S. Anderson, A. K. Davis, D. H. Edgell, C. J. Forrest, D. H. Froula, V. N. Goncharov, D. W. Jacobs-Perkins, S. P. Regan, A. Shvydky, E. M. Campbell, and T. C. Sangster, “Improving Direct-Drive Implosion Symmetry Using 3-D X-Ray Tomography on OMEGA” (invited).

D. Turnbull, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, S. Bucht, A. S. Davies, P. Franke, D. Haberberger, J. Katz, T. J. Kessler, A. L. Milder, J. P. Palastro, J. L. Shaw, D. H. Froula, N. Vafaei-Najafabadi, J. Vieira, and F. Quéré, “Flying Focus and Its Application to Plasma-Based Laser Amplifiers” (invited).

The following presentations were made at the 48th Anomalous Absorption Conference, Bar Harbor, ME 8–13 July 2018:

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, J. D. Zuegel, D. H. Froula, and W. Rozmus, “Pico-second-Resolved Collective Thomson Scattering in Underdense Collisional Plasmas.”

D. H. Edgell, J. Katz, D. Turnbull, R. K. Follett, J. P. Palastro, and D. H. Froula, “Analysis of Unabsorbed Light Beamlet Images on OMEGA.”

D. H. Froula, D. Turnbull, J. Bromage, A. Colaitis, R. K. Follett, T. J. Kessler, J. P. Palastro, J. G. Shaw, V. N. Goncharov,

J. D. Zuegel, T. C. Sangster, E. M. Campbell, J. W. Bates, T. Chapman, A. J. Schmitt, J. Weaver, S. P. Obenschain, L. Divol, and P. Michel, “Plasma Physics and Broadband Lasers—A Path to an Expanded Inertial Confinement Fusion Design Space.”

A. M. Hansen, D. Turnbull, D. Haberberger, J. Katz, D. Mastro Simone, R. K. Follett, and D. H. Froula, “Plasma Characterization for the OMEGA Laser–Plasma Interaction Platform.”

S. X. Hu, W. Theobald, P. B. Radha, J. L. Peebles, S. P. Regan, M. J. Bonino, D. R. Harding, V. N. Goncharov, N. Petta, T. C. Sangster, E. M. Campbell, and A. Nikroo, “Mitigating Laser-Imprint Effects on Direct-Drive Implosions on OMEGA with Low-Density Foam Layers.”

V. V. Karasiev, S. X. Hu, and L. Calderin, “Density-Functional Theory Methods for Transport and Optical Properties: Application to Warm Dense Silicon.”

A. V. Maximov, J. G. Shaw, R. W. Short, and J. P. Palastro, “Modeling of Stimulated Raman Scattering in Inhomogeneous Plasmas for Conditions Relevant to the National Ignition Facility.”

J. P. Palastro, J. G. Shaw, R. K. Follett, A. Colaïtis, D. Turnbull, A. Maximov, V. N. Goncharov, and D. H. Froula, “Resonant Absorption of a Broadband Laser.”

M. J. Rosenberg, A. A. Solodov, W. Seka, R. K. Follett, 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, G. Swadling, J. S. Ross, T. Chapman, L. Masse, 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. 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.”

The following presentations were made at Research at High Pressure, Holderness, NH, 15–20 July 2018:

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

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

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.”

X. Gong, D. N. Polsin, J. R. Rygg, B. J. Henderson, L. Crandall, M. Huff, R. Saha, T. R. Boehly, G. W. Collins, A. E. Lazicki, J. H. Eggert, R. Smith, F. Coppari, M. Gorman, R. Briggs, M. McMahon, and A. Coleman, “Crystal Structure and Optical Properties of Ramp-Compressed Sodium.”

B. J. Henderson, M. Zaghou, 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.”

M. Huff, D. E. Fratanduono, C. A. McCoy, T. R. Boehly, P. M. Celliers, J. H. Eggert, G. W. Collins, and J. R. Rygg, “Nonsteady Waves Analysis to Extract Sound Speed at High Pressures.”

D. N. Polsin, T. R. Boehly, J. A. Delettrez, G. W. Collins, J. R. Rygg, X. Gong, B. J. Henderson, D. E. Fratanduono, R. Smith, R. Kraus, P. M. Celliers, M. Millot, F. Coppari, A. Jenei, D. C. Swift, M. C. Gregor, J. H. Eggert, C. A. McCoy, J.-P. Davis, C. T. Seagle, and M. I. McMahon, “High-Pressure Phase Transformations of Ramp-Compressed Aluminum and Sodium.”

J. J. Ruby, J. R. Rygg, C. J. Forrest, B. Bachmann, Y. Ping, A. E. Jenei, J. A. Gaffney, H. Sio, N. V. Kabadi, and G. W. Collins, “Equation-of-State Measurements at High Pressure in Spherical Geometry.”

J. R. Rygg, R. F. Smith, A. E. Lazicki, D. G. Braun, D. E. Fratanduono, R. G. Kraus, J. M. McNaney, D. Swift, C. E.

Wehrenberg, G. W. Collins, F. Coppari, D. N. Polsin, and J. H. Eggert, "Performance and Uncertainty Analysis of the X-Ray Diffraction Platform at the National Ignition Facility."

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."

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

M. Zaghoo, G. W. Collins, T. R. Boehly, J. R. Rygg, S. X. Hu, I. F. Silvera, A. Salamat, R. Husband, and P. M. Celliers, "The First Metal: Bench Top Studies."

T. C. Sangster, "LLE: A Unique University-Based Research Center Supporting National Security and Science for the United States," presented at Purdue University Nuclear Engineering, West Lafayette, IN, 26 July 2018.

D. N. Polsin, T. R. Boehly, G. W. Collins, J. R. Rygg, X. Gong, A. Jenei, M. Millot, J. H. Eggert, and M. I. McMahon, "X-Ray Diffraction of Ramp-Compressed Sodium," presented at the 2018 Workshop on the International Union of Crystallography Commission on High Pressure, Honolulu, HI, 29 July–2 August 2018.

The following presentations were made at the 2018 Siegman School Lecture, Hven, Sweden, 29 July–4 August 2018:

G. W. Jenkins, C. Feng, R. Cuffney, and J. Bromage, "Thin-Disk Yb:YAG Regenerative Amplifier System for High-Average-Power Applications."

J. D. Zuegel, "Laser Science and Technology for Laser Fusion."

J. D. Zuegel, K. S. Anderson, T. R. Boehly, R. Betti, R. S. Craxton, J. H. Kelly, T. J. Kessler, J. P. Knauer, B. E.

Kruschwitz, J. R. Marciante, F. J. Marshall, R. L. McCrory, S. P. Regan, T. C. Sangster, W. Seka, S. Skupsky, J. M. Soures, C. Stoeckl, W. Theobald, and D. D. Meyerhofer, "Laser Fusion for Laser Jocks: Basic Principles of a Laser Application Meeting a Great Challenge."

The following presentations were made at the 2018 Kearns Center Research Symposium, Rochester, NY, 30 July 2018:

B. Atchison, C. Wang, Y. Akbas, and R. Sobolewski, "Characterization of Ultrafast Carrier Dynamics in Semiconducting CdMnTe via Pump-Probe Spectroscopy."

T. Shou, J. Zhang, G. Chen, and R. Sobolewski, "Spintronic Terahertz Emitters."

J. Zhang, T. Y. Shou, G. Chen, and R. Sobolewski, "Time-Resolved Terahertz Emitter Spectroscopy."

C. J. Forrest, V. Yu, Glebov, J. P. Knauer, P. B. Radha, S. P. Regan, J. R. Rygg, U. Schroeder, A. Schwemlein, C. Stoeckl, J. A. Frenje, M. Gatu Johnson, F. H. Séguin, R. D. Petrasso, H. Sio, D. T. Casey, C. Cerjan, D. Dearborn, M. J. Edwards, G. P. Grim, R. Hatarik, S. P. Hatchett, O. S. Jones, O. L. Landen, A. J. Mackinnon, D. McNabb, S. Quaglioni, D. B. Sayre, S. Sepke, P. Springer, I. Thomson, R. E. Tipton, C. Brune, A. Voinov, B. Appelbe, A. Crilly, G. Hale, H. W. Herrmann, Y. H. Kim, M. Paris, and A. B. Zylstra, "Nuclear Science Experiments at the University of Rochester's Omega Laser Facility," presented at the 2018 Low Energy Community Meeting, East Lansing, MI, 10–11 August 2018.

J. L. Shaw, D. Haberberger, A. Hansen, J. Katz, D. Mastro Simone, D. H. Froula, F. Albert, N. Lemos, J. Williams, L. D. Amorim, and N. Vafaei-Najafabadi, "Laser Wakefield Accelerator Platform for OMEGA EP," presented at Advanced Accelerator Concepts Workshop, Breckenridge, CO, 12–17 August 2018.

K. L. Marshall, "Liquid Crystals and a 35-Year Journey from Information Displays to Laser Fusion and Beyond," presented at

the University of Arizona, College of Optical Sciences, Tucson, AZ, 16 August 2018 (invited).

K. L. Marshall, J. Smith, A. Callahan, H. Carder, M. Johnston, and M. Ordway, "Optically Addressable Liquid Crystal Laser Beam Shapers Employing Photoalignment Layer Materials and Technologies," presented at Liquid Crystals XXII, San Diego, CA, 19–23 August 2018.

The following presentations were made at LaserNetUS, Lincoln, NE, 20–21 August 2018:

J. Bromage, S.-W. Bahk, I. A. Begishev, C. Dorrer, M. J. Guardalben, B. N. Hoffman, J. B. Oliver, R. G. Roides, E. M. Schiesser, 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 Amplifier Systems."

S. Bucht, J. Bromage, D. Haberberger, and D. H. Froula, "A High-Power Laser for Raman Amplification Studies."

E. M. Campbell, "LLE Perspective on Open Access Large-Scale PE Laser Facility in the U.S."

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, J. D. Zuegel, D. H. Froula, and W. Rozmus, "Pico-second-Resolved Collective Thomson Scattering in Underdense Collisional Plasmas."

A. M. Hansen, D. Haberberger, J. Katz, R. K. Follett, and D. H. Froula, "OMEGA Supersonic Gas-Jet Target System Characterization."

R. J. Hennen, M. Sherlock, W. Rozmus, J. Katz, D. Cao, J. P. Palastro, and D. H. Froula, "Observation of Nonlocal Heat Flux Using Thomson Scattering."

A. L. Milder and D. H. Froula, "Measuring Electron Distribution Functions Using Collective Thomson Scattering."

H. G. Rinderknecht, S.-W. Bahk, I. A. Begishev, J. Bromage, R. Cuffney, C. Dorrer, G. Fiksel, T. Filkins, C. Freeman, D. H.

Froula, S. T. Ivancic, J. Katz, C. Mileham, P. M. Nilson, J. P. Palastro, M. Spilatro, C. R. Stillman, C. Stoeckl, W. Theobald, D. Turnbull, and J. D. Zuegel, "Experimental Capabilities and Results from the Multi-Terawatt Laser at the Laboratory for Laser Energetics."

J. D. Zuegel, "Capabilities and Future Prospects for the Multi-Terawatt Laser Facility at LLE."

J. D. Zuegel, I. A. Begishev, J. Bromage, S.-W. Bahk, R. Cuffney, C. Dorrer, D. Haberberger, D. H. Froula, C. Mileham, P. M. Nilson, and C. Stoeckl, "A Multi-Terawatt Laser for Plasma Physics Research and Advanced Laser Development."

The following presentations were made at the 8th Conference of the International Committee on Ultrahigh Intensity Lasers, Lindau, Germany, 9–14 September 2018:

S.-W. Bahk and C. Dorrer, "Characterization of Spatiotemporal Coupling with Multispectral Imaging."

S.-W. Bahk, J. B. Oliver, K. R. P. Kafka, and J. Bromage, "Dynamic Field Distribution Study Inside a Dispersive Multi-layer Dielectric Coating for Improving the Ultrashort Laser Pulse Damage Threshold."

D. Haberberger, A. Davies, R. Boni, J. Bromage, S. Bucht, R. K. Follett, J. Katz, P. Franke, A. Milder, J. P. Palastro, J. L. Shaw, D. Turnbull, J. D. Zuegel, D. H. Froula, R. Bingham, P. A. Norreys, and J. Sadler, "Designing an Efficient Raman Amplifier."

E. M. Campbell, "Advanced Diagnostics for Laser-Direct-Drive Inertial Confinement Fusion (ICF)," presented at ULITIMA 2018, Lemont, IL, 11–14 September 2018.

M. Zaghoo, T. R. Boehly, J. R. Rygg, P. M. Celliers, S. X. Hu, and G. W. Collins, "Breakdown of Fermi Degeneracy in the Simplest Liquid Metal," presented at Harvard Physics Scholars Research Retreat, Hull, MA, 12 September 2018.

W. T. Shmayda, "Tritium Operations at the Laboratory for Laser Energetics," 30th Symposium on Fusion Technology, Giardini Naxos, Italy, 16–21 September 2018.

The following presentations were made at Laser Damage 2018, Boulder, CO, 23–26 September 2018:

M. Chorel, S. Papernov, A. A. Kozlov, B. N. Hoffman, J. B. Oliver, S. G. Demos, L. Lamaignère, T. Lanternier, É. Lavastre, B. Bousquet, and J. Néauport, "Damage Thresholds in Sub-ps of Hafnia and Silica Monolayers and Correlation to Optical Signatures."

S. G. Demos, B. N. Hoffman, C. W. Carr, D. A. Cross, R. A. Negres, and J. D. Bude, "Laser-Induced–Damage Mechanisms Under Nanosecond Laser Irradiation in Absorbing Glasses."

B. N. Hoffman, S. Papernov, and S. G. Demos, "Investigation and Characterization of Optical Signatures in Multilayer Dielectric Gratings to Improve Cleanliness."

T. Z. Kosci, S. Papernov, A. A. Kozlov, K. Kafka, K. L. Marshall, and S. G. Demos, "Laser-Induced–Damage Thresholds of Nematic Liquid Crystals at 1 ns and Multiple Wavelengths."

A. A. Kozlov, B. Hoffman, J. B. Oliver, and S. G. Demos, "Damage Morphology at Pulse Lengths Near the Transition

from Intrinsic to Defect-Driven Initiation in Hafnia-Silica High Reflectors."

J. B. Oliver, B. Charles, D. Coates, S. G. Demos, B. N. Hoffman, K. R. P. Kafka, A. A. Kozlov, J. C. Lambropoulos, S. MacNally, T. Noll, S. Papernov, A. L. Rigatti, D. Sadowski, and C. Smith, "Predictions of Electric-Field-Limited Laser Damage for Multilayer Coatings."

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, X. Gong, L. Crandall, J. J. Ruby, G. Tabak, M. Huff, J. H. Eggert, A. Lazicki, R. F. Smith, F. Coppari, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, P. M. Celliers, D. G. Braun, S. Hamel, M. Millot, M. Gorman, R. Briggs, S. Ali, R. Kraus, M. McMahon, A. Colman, P. Loubeyre, S. Brygoo, R. Jeanloz, R. Falcone, C. Bolme, A. Gleason, S. H. Glenzer, H. J. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, "High Energy Density Science: A New Window to the Quantum Realm and New Worlds," presented at the SLAC Lecture, Menlo Park, CA, 26 September 2018.

J. Schoen, "History of the Center for Optics Manufacturing," presented at the AmeriCOM Symposium; Rochester, NY, 27 September 2018.