# Publications and Conference Presentations

## Publications

Y. Arikawa, M. Ota, M. Nakajima, T. Shimizu, S. Segawa, T. N. K. Phan, Y. Sakawa, Y. Abe, A. Morace, S. R. Mirfayzi, A. Yogo, S. Fujioka, M. Nakai, H. Shiraga, H. Azechi, R. Kodama, K. Kan, J. Frenje, M. Gatu Johnson, A. Bose, N. V. Kabadi, G. D. Sutcliffe, P. Adrian, C. Li, F. H. Séguin, and R. Petrasso, "The Conceptual Design of 1-ps Time Resolution Neutron Detector for Fusion Reaction History Measurement at OMEGA and the National Ignition Facility," Rev. Sci. Instrum. **91**, 063304 (2020).

S. H. Cao, R. Yan, H. Wen, J. Li, and C. Ren, "Cogeneration of Hot Electrons from Multiple Laser-Plasma Instabilities," Phys. Rev. E **101**, 053205 (2020).

L. Ceurvorst, R. Betti, A. Casner, V. Gopalaswamy, A. Bose, S. X. Hu, E. M. Campbell, S. P. Regan, C. A. McCoy, M. Karasik, J. L. Peebles, M. Tabak, and W. Theobald, "Hybrid Target Design for Imprint Mitigation in Direct-Drive Inertial Confinement Fusion," Phys. Rev. E **101**, 063207 (2020).

L. E. Chen, A. F. A. Bott, P. Tzeferacos, A. Rigby, A. Bell, R. Bingham, C. Graziani, J. Katz, M. Koenig, C. K. Li, R. Petrasso, H.-S. Park, J. S. Ross, D. Ryu, T. G. White, B. Reville, J. Matthews, J. Meinecke, F. Miniati, E. G. Zweibel, S. Sarkar, A. A. Schekochihin, D. Q. Lamb, D. H. Froula, and G. Gregori, "Transport of High-Energy Charged Particles Through Spatially Intermittent Turbulent Magnetic Fields," Astrophys. J. **892**, 114 (2020).

A. R. Christopherson, R. Betti, S. Miller, V. Gopalaswamy, O. M. Mannion, and D. Cao, "Theory of Ignition and Burn Propagation in Inertial Fusion Implosions," Phys. Plasmas **27**, 052708 (2020).

D. J. Erskine, "Forward Modeling of Doppler Velocity Interferometer System for Improved Shockwave Measurements," Rev. Sci. Instrum. **91**, 043103 (2020).

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, "A Thin Alumina Film as a Tritium Adsorption Inhibitor for Stainless Steel 316," Fusion Sci. Technol. **76**, 424 (2020).

K. Falk, C. J. Fontes, C. L. Fryer, C. W. Greeff, M. Holec, H. M. Johns, D. S. Montgomery, D. W. Schmidt, and M. M. Šmíd, "Experimental Observation of Elevated Heating in Dynamically Compressed CH Foam," Plasma Phys. Control. Fusion **62**, 074001 (2020).

F. Fiuza, G. F. Swadling, A. Grassi, H. G. Rinderknecht, D. P. Higginson, D. D. Ryutov, C. Bruulsema, R. P. Drake, S. Funk, S. Glenzer, G. Gregori, C. K. Li, B. B. Pollock, B. A. Remington, J. S. Ross, W. Rozmus, Y. Sakawa, A. Spitkovsky, S. Wilks, and H.-S. Park, "Electron Acceleration in Laboratory-Produced Turbulent Collisionless Shocks," Nat. Phys. **16**, 916 (2020).

R. K. Follett, J. G. Shaw, J. F. Myatt, D. H. Froula, and J. P. Palastro, "Multibeam Absolute Stimulated Raman Scattering and Two-Plasmon Decay," Phys. Rev. E **101**, 043214 (2020).

Y. Frank, G. E. Kemp, E. V. Marley, G. P. Callejo, M. E. Foord, M. B. Schneider, Y. Ehrlich, and M. Fraenkel, "Hydrodynamic Conditions in Laser Irradiated Buried Layer Experiments," Phys. Plasmas **27**, 063301 (2020).

B. M. Haines, D. E. Keller, J. A. Marozas, P. W. McKenty, K. S. Anderson, T. J. B. Collins, W. W. Dai, M. L. Hall, S. Jones, M. D. McKay Jr., R. M. Rauenzahn, and D. N. Woods, "Coupling Laser Physics to Radiation-Hydrodynamics," Comput. Fluids **201**, 104478 (2020).

E. C. Hansen, J. R. Davies, D. H. Barnak, R. Betti, E. M. Campbell, V. Yu. Glebov, J. P. Knauer, L. S. Leal, J. L. Peebles, A. B. Sefkow, and K. M. Woo, "Neutron Yield Enhancement and Suppression by Magnetization in Laser-Driven Cylindrical Implosions," Phys. Plasmas **27**, 062703 (2020) (invited).

S. X. Hu, V. V. Karasiev, V. Recoules, P. M. Nilson, N. Brouwer, and M. Torrent, "Interspecies Radiative Transition in Warm and Superdense Plasma Mixtures," Nat. Commun. **11**, 1989 (2020).

A. Kar, S. X. Hu, G. Duchateau, J. Carroll-Nellenback, and P. B. Radha, "Implementing a Microphysics Model in Hydrodynamic Simulations to Study the Initial Plasma Formation in Dielectric Ablator Materials for Direct-Drive Implosions," Phys. Rev. E **101**, 063202 (2020).

P. R. C. Kent, A. Annaberdiyev, A. Benali, M. C. Bennett, E. J. L. Borda, P. Doak, H. Hao, K. D. Jordan, J. T. Krogel, I. Kylänpää, J. Lee, Y. Luo, F. D. Malone, C. A. Melton, L. Mitas, M. A. Morales, E. Neuscamman, F. A. Reboredo, B. Rubenstein, K. Saritas, S. Upadhyay, G. Wang, S. Zhang, and L. Zhao, "QMCPACK: Advances in the Development, Efficiency, and Application of Auxiliary Field and Real-Space Variational and Diffusion Quantum Monte Carlo," J. Chem. Phys. **152**, 174105 (2020).

B. Lahmann, M. Gatu Johnson, J. A. Frenje, V. Yu. Glebov, H. G. Rinderknecht, F. H. Séguin, G. Sutcliffe, and R. D. Petrasso, "CR39 Nuclear Track Detector Response to Inertial Confinement Fusion Relevant Ions," Rev. Sci. Instrum. **91**, 053502 (2020).

O. M. Mannion, J. P. Knauer, V. Yu. Glebov, C. J. Forrest, A. Liu, Z. L. Mohamed, M. H. Romanofsky, T. C. Sangster, C. Stoeckl, and S. P. Regan, "A Suite of Neutron Time-of-Flight Detectors to Measure Hot-Spot Motion in Direct-Drive Inertial Confinement Fusion Experiments on OMEGA," Nucl. Instrum. Methods Phys. Res. A **964**, 163774 (2020).

D. I. Mihaylov, V. V. Karasiev, and S. X. Hu, "Thermal Hybrid Exchange-Correlation Density Functional for Improving the Description of Warm Dense Matter," Phys. Rev. B **101**, 245141 (2020).

J. L. Peebles, J. R. Davies, D. H. Barnak, T. Cracium, M. J. Bonino, and R. Betti, "Axial Proton Probing of Magnetic and Electric Fields Inside Laser-Driven Coils," Phys. Plasmas **27**, 063109 (2020).

H. G. Rinderknecht, D. T. Casey, R. Hatarik, R. M. Bionta, B. J. MacGowan, P. Patel, O. L. Landen, E. P. Hartouni, and O. A. Hurricane, "Azimuthal Drive Asymmetry in Inertial Confinement Fusion Implosions on the National Ignition Facility," Phys. Rev. Lett. **124**, 145002 (2020).

M. J. Rosenberg, A. A. Solodov, W. Seka, R. K. Follett, J. F. Myatt, A. V. Maximov, C. Ren, S. Cao, P. Michel, M. Hohenberger, J. P. Palastro, C. Goyon, T. Chapman, J. E. Ralph, J. D. Moody, R. H. H. Scott, K. Glize, and S. P. Regan, "Stimulated Raman Scattering Mechanisms and Scaling Behavior in Planar Direct-Drive Experiments at the National Ignition Facility," Phys. Plasmas **27**, 042705 (2020).

J. R. Rygg, R. F. Smith, A. E. Lazicki, D. G. Braun, D. E. Fratanduono, R. G. Kraus, J. M. McNaney, D. C. Swift, C. E. Wehrenberg, F. Coppari, M. F. Ahmed, M. A. Barrios, K. J. M. Blobaum, G. W. Collins, A. L. Cook, P. Di Nicola, E. G. Dzenitis, S. Gonzales, B. F. Heidl, M. Hohenberger, A. House, N. Izumi, D. H. Kalantar, S. F. Khan, T. R. Kohut, C. Kumar, N. D. Masters, D. N. Polsin, S. P. Regan, C. A. Smith, R. M. Vignes, M. A. Wall, J. Ward, J. S. Wark, T. L. Zobrist, A. Arsenlis, and J. H. Eggert, "X-Ray Diffraction at the National Ignition Facility," Rev. Sci. Instrum. **91**, 043902 (2020).

R. W. Short, "Absolute Stimulated Raman Side Scatter in Direct-Drive Laser-Produced Plasmas," Phys. Plasmas **27**, 042703 (2020).

A. A. Solodov, M. J. Rosenberg, W. Seka, J. F. Myatt, M. Hohenberger, R. Epstein, C. Stoeckl, R. W. Short, S. P. Regan, P. Michel, T. Chapman, R. K. Follett, J. P. Palastro, D. H. Froula, P. B. Radha, J. D. Moody, and V. N. Goncharov, "Hot-Electron Generation at Direct-Drive Ignition-Relevant Plasma Conditions at the National Ignition Facility," Phys. Plasmas **27**, 052706 (2020).

R. B. Spielman and A. B. Sefkow, "Modeling Variable-Impedance, Magnetically Insulated, Transmission Lines," in *2019 IEEE Pulsed Power & Plasma Science (PPPS)* (IEEE, Piscataway, NJ, 2020).

G. F. Swadling, C. Bruulsema, F. Fiuza, D. P. Higginson, C. M. Huntington, H.S. Park, B. B. Pollock, W. Rozmus, H. G. Rinderknecht, J. Katz, A. Birkel, and J. S. Ross, "Measurement of Kinetic-Scale Current Filamentation Dynamics and Associated Magnetic Fields in Interpenetrating Plasmas," Phys. Rev. Lett. **124**, 215001 (2020).

D. Turnbull, A. V. Maximov, D. H. Edgell, W. Seka, R. K. Follett, J. P. Palastro, D. Cao, V. N. Goncharov, C. Stoeckl, and D. H. Froula, "Anomalous Absorption by the Two-Plasmon Decay Instability," Phys. Rev. Lett. **124**, 185001 (2020).

T. Walton, J. L. Sebald, I. E. Golovkin, J. J. MacFarlane, V. N. Golovkina, A. A. Solodov, P. M. Nilson, and R. Epstein, "Parameterizing Hot Electron Energy Distributions for Tabular Emissivities and Opacities," High Energy Density Phys. **35**, 100730 (2020).

K. M. Woo, R. Betti, O. M. Mannion, C. J. Forrest, J. P. Knauer, V. N. Goncharov, P. B. Radha, V. Gopalaswamy, and V. Yu. Glebov, "Inferring Thermal Ion Temperature and Residual

Kinetic Energy from Nuclear Measurements in Inertial Confinement Fusion Implosions," Phys. Plasmas **27**, 062702 (2020) (invited).

J. Zhang, R. Wei, M. ElKabbash, E. M. Campbell, and C. Guo, "Thin-Film Perfect Infrared Absorbers over Single- and Dual-Band Atmospheric Windows," Opt. Lett. **45**, 2800 (2020).

Y. Zhao and W. R. Donaldson, "Ultrafast UV AlGaN Metal–Semiconductor–Metal Photodetector with a Response Time Below 25 ps," IEEE J. Quantum Electron. **56**, 4000607 (2020).

A. B. Zylstra, H. W. Herrmann, Y. H. Kim, A. McEvoy, J. A. Frenje, M. Gatu Johnson, R. D. Petrasso, V. Yu. Glebov, C. Forrest, J. Delettrez, S. Gales, and M. Rubery, "$^{2}$H($p$,$\gamma$)$^{3}$He Cross Section Measurement Using High-Energy-Density Plasmas," Phys. Rev. C **101**, 042802(R) (2020).

A. B. Zylstra, J. R. Rygg, G. W. Collins, C. K. Li, J. A. Frenje, R. D. Petrasso, S. R. Nagel, P. Fitzsimmons, and H. Reynolds, "Platform Development for $dE/dx$ Measurements on Short-Pulse Laser Facilities," High Energy Density Phys. **35**, 100731 (2020).

## Forthcoming Publications

K. L. Baker, C. A. Thomas, D. T. Casey, M. Hohenberger, S. Khan, B. K. Spears, O. L. Landen, R. Nora, D. T. Woods, J. L. Milovich, R. L. Berger, D. Strozzi, C. Weber, D. Clark, O. A. Hurricane, D. A. Callahan, A. L. Kritcher, B. Bachmann, L. R. Benedetti, R. Bionta, P. M. Celliers, D. Fittinghoff, C. Goyon, R. Hatarik, N. Izumi, M. Gatu Johnson, G. Kyrala, T. Ma, K. Meaney, M. Millot, S. R. Nagel, P. K. Patel, D. Turnbull, P. L. Volegov, C. Yeamans, and C. Wilde, "Hot-Spot Parameter Scaling with Velocity and Yield for High-Adiabat Layered Implosions at the National Ignition Facility," to be published in Physical Review E.

D. H. Barnak, J. R. Davies, J. P. Knauer, and P. M. Kozlowski, "Soft X-Ray Spectrum Unfold of K-Edge–Filtered X-Ray Diode Arrays Using Cubic Splines," to be published in Review of Scientific Instruments.

K. A. Bauer, M. Heimbueger, J. Kwiatkowski, S. Sampat, L. J. Waxer, E. C. Cost, J. H. Kelly, V. Kobilansky, S. F. B. Morse, D. Nelson, D. Weiner, G. Weselak, and J. Zou, "Optical Characterization of the On-Target OMEGA Focal Spot at High Energy Using the Full-Beam In-Tank Diagnostic," to be published in Applied Optics.

P. T. Campbell, C. A. Walsh, B. K. Russell, J. P. Chittenden, A. Crilly, G. Fiksel, P. M. Nilson, A. G. R. Thomas, K. Krushelnick, and L. Willingale, "Magnetic Signatures of Radiation-Driven Double Ablation Fronts," to be published in Physical Review Letters.

Y.-H. Chen, J. R. Peterson, L. A. Johnson, T. G. Jones, B. Hafizi, A. B. Stamm, A. C. Ting, J. P. Palastro, M. H. Helle, and D. Kaganovich, "Nonlinear Underwater Propagation of Pico-second Ultraviolet Laser Beams," to be published in Optic Letters.

L. E. Crandall, J. R. Rygg, D. Spaulding, T. R. Boehly, S. Brygoo, P. M. Celliers, J. H. Eggert, D. E. Fratanduono, B. J. Henderson, M. F. Huff, R. Jeanloz, A. Lazicki, M. C. Marshall, D. N. Polsin, M. Zaghoo, M. Millot, and G. W. Collins, "Equation of State of $CO_2$ Shock Compressed to 1 TPa," to be published in Physical Review Letters.

W. A. Farmer, C. Bruulsema, G. F. Swadling, M. W. Sherlock, M. D. Rosen, W. Rozmus, D. H. Edgell, J. Katz, B. B. Pollock, and J. S. Ross, "Validation of Heat Transport Modeling Using Directly Driven Beryllium Spheres," to be published in Physics of Plasmas.

M. Gatu Johnson, B. M. Haines, P. J. Adrian, C. Forrest, J. A. Frenje, V. Yu. Glebov, W. Grimble, R. Janezic, J. P. Knauer, B. Lahmann, F. J. Marshall, T. Michel, F. H. Séguin, C. Stoeckl, and R. D. Petrasso "3-D *xRAGE* Simulation of Inertial Confinement Fusion Implosion with Imposed Mode-2 Laser Drive Asymmetry," to be published in High Energy Density Physics.

V. N. Goncharov, I. V. Igumenshchev, D. R. Harding, S. F. B. Morse, S. X. Hu, P. B. Radha, D. H. Froula, S. P. Regan, T. C. Sangster, and E. M. Campbell, "Novel Hot-Spot Ignition Designs for Inertial Confinement Fusion with Liquid Deuterium–Tritium Spheres," to be published in Physical Review Letters.

D. R. Harding, M. D. Wittman, N. P. Redden, D. H. Edgell, and J. Ulreich, "Comparison of Shadowgraphy and X-Ray Phase Contrast Methods for Characterizing a DT Ice Layer in an Inertial Confinement Fusion Target," to be published in Fusion Science and Technology.

A. J. Harvey-Thompson, M. R. Weis, D. E. Ruiz, M. S. Wei, A. Sefkow, T. Nagayama, E. M. Campbell, J. Fooks, M. Glinsky, and K. J. Peterson, "The Effect of Laser Entrance Hole Foil Thickness on MagLIF-Relevant Laser Preheat," to be published in Physics of Plasmas.

J. Hinz, V. V. Karasiev, S. X. Hu, M. Zaghoo, D. Mejía-Rodríguez, S. B. Trickey, and L. Calderín, "Fully Consistent Density Functional Theory Determination of the Insulator-Metal Transition Boundary in Warm Dense Hydrogen," to be published in Physical Review Research.

B. N. Hoffman, A. A. Kozlov, N. Liu, H. Huang, J. B. Oliver, A. L. Rigatti, T. J. Kessler, A. A. Shestopalov, and S. G. Demos, "Mechanisms of Picosecond Laser-Induced Damage in Common Multilayer Dielectric Gratings," to be published in Optics Express.

G. W. Jenkins, C. Feng, and J. Bromage, "Overcoming Gas Ionization Limitations with Divided-Pulse Nonlinear Compression," to be published in Optics Express.

T. Z. Kosc, H. Huang, T. J. Kessler, R. A. Negres, and S. G. Demos, "Determination of the Raman Polarizability Tensor in the Optically Anistropic Crystal Potassium Dihydrogen Phosphate and Its Deuterated Analog," to be published in Scientific Reports.

A. L. Kritcher, D. C. Swift, T. Döppner, B. Bachmann, L. X. Benedict, G. W. Collins, J. L. DuBois, F. Elsner, G. Fontaine, J. A. Gaffney, S. Hamel, A. Lazicki, W. R. Johnson, N. Kostinski, D. Kraus, M. J. MacDonald, B. Maddox, M. E. Martin, P. Neumayer, A. Nikroo, J. Nilsen, B. A. Remington, D. Saumon, P. A. Sterne, W. Sweet, A. A. Correa, H. D. Whitley, R. W. Falcone, and S. H. Glenzer, "A Measurement of the Equation of State of Carbon Envelopes of White Dwarfs," to be published in Nature.

A. V. Maximov, J. G. Shaw, and J. P. Palastro, "Nonlinear Transmission of Laser Light Through Coronal Plasma Due to Self-Induced Incoherence," to be published in Physical Review E.

R. Paul, S. X. Hu, V. V. Karasiev, S. A. Bonev, and D. N. Polsin, "Thermal Effects on the Electronic Properties of Sodium Electride Under High Pressures," to be published in Physical Review B.

M. Sharpe, W. T. Shmayda, and K. Glance, "Measurement of Palladium Hydride and Palladium Deuteride Isotherms between 130 K and 393 K," to be published in Fusion Science and Technology.

D. B. Sinars, M. A. Sweeney, C. S. Alexander, D. J. Ampleford, T. Ao, J. P. Apruzese, C. Aragon, D. J. Armstrong, K. N. Austin, T. J. Awe, A. D. Baczewski, J. E. Bailey, K. L. Baker, C. R. Ball, H. T. Barclay, S. Beatty, K. Beckwith, K. S. Bell, J. F. Benage, N. L. Bennett, K. Blaha, D. E. Bliss, J. J. Boerner, C. J. Bourdon, B. A. Branch, J. L. Brown, E. M. Campbell, R. B. Campbell, D. G. Chacon, G. A. Chandler, K. Chandler, P. J. Christenson, M. D. Christison, E. B. Christner, R. C. Clay, K. R. Cochrane, A. P. Colombo, B. M. Cook, C. A. Coverdale, M. E. Cuneo, J. S. Custer, A. Dasgupta, J.-P. Davis, M. P. Desjarlais, D. H. Dolan, J. D. Douglass, G. S. Dunham, S. Duwal, A. D. Edens, M. J. Edwards, E. G. Evstatiev, B. G. Farfan, J. R. Fein, E. S. Field, J. A. Fisher, T. M. Flanagan, D. G. Flicker, M. D. Furnish, B. R. Galloway, P. D. Gard, T. A. Gardiner, M. Geissel, J. L. Giuliani, M. E. Glinksy, M. R. Gomez, G. P. Grim, K. D. Hahn, T. A. Haill, N. D. Hamlin, J. H. Hammer, S. B. Hansen, H. L. Hanshaw, E. C. Harding, A. J. Harvey-Thompson, D. Headley, M. C. Herrmann, M. H. Hess, C. Highstrete, O. A. Hurricane, B. T. Hutsel, C. A. Jennings, O. M. Johns, D. Johnson, M. D. Johnston, B. M. Jones, M. C. Jones, P. A. Jones, P. E. Kalita, R. J. Kamm, J. W. Kellogg, M. L. Kiefer, M. W. Kimmel, P. F. Knapp, M. D. Knudson, A. Kreft, G. R. Laity, P. W. Lake, D. C. Lamppa, W. L. Langston, J. S. Lash, K. R. LeChien, J. J. Leckbee, R. J. Leeper, G. T. Leifeste, R. W. Lemke, W. Lewis, S. A. Lewis, G. P. Loisel, Q. M. Looker, A. J. Lopez, D. J. Lucero, S. A. MacLaren, R. J. Magyar, M. A. Mangan, M. R. Martin, T. R. Mattsson, M. K. Matzen, A. J. Maurer, M. G. Mazarakis, R. D. McBride, H. S. McLean, C. A. McCoy, G. R. McKee, J. L. McKenney, A. R. Miles, J. A. Mills, M. D. Mitchell, N. W. Moore, C. E. Myers, T. Nagayama, G. Natoni, A. C. Owen, S. Patel, K. J. Peterson, T. D. Pointon, J. L. Porter, A. J. Porwitzky, S. Radovich, K. S. Raman, P. K. Rambo, W. D. Reinhart, G. K. Robertson, G. A. Rochau, S. Root, D. V. Rose, D. C. Rovang, C. L. Ruiz, D. E. Ruiz, D. Sandoval, M. E. Savage, M. E. Sceiford, M. A. Schaeuble, P. F. Schmit, M. S. Schollmeier, J. Schwarz, C. T. Seagle, A. B. Sefkow, D. B. Seidel, G. A. Shipley, J. Shores, L. Shulenburger, S. C. Simpson, S. A. Slutz, I. C. Smith, C. S. Speas, P. E. Specht, M. J. Speir, D. C. Spencer, P. T. Springer, A. M. Steiner, B. S. Stolzfus, W. A. Stygar, J. Ward Thornhill, J. A. Torres, J. P. Townsend, C. Tyler, R. A. Vesey, P. E. Wakeland, T. J. Webb, E. A. Weinbrecht, M. R. Weis, D. R. Welch, J. L. Wise, M. Wu, D. A. Yager-Elorriaga, A. Yu, and E. P. Yu, "Review of Pulsed-Power–Driven High-Energy-Density Physics Research on Z at Sandia," to be published in Physics of Plasmas.

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

S. Tochitsky, A. Pak, F. Fiuza, D. Haberberger, N. Lemos, A. Link, D. H. Froula, and C. Joshi, "Laser-Driven Collisionless Shock Acceleration of Ions from Near-Critical Plasmas," to be published in Physics of Plasmas.

S. Zhang and S. X. Hu, "Species Separation and Hydrogen Streaming upon Shock Release from Polystyrene Under Inertial Confinement Fusion Conditions," to be published in Physical Review Letters.

S. Zhang, H. D. Whitley, and T. Ogitsu, "Phase Transformation in Boron Under Shock Compression," to be published in Solid State Sciences.

## Conference Presentations

The following presentations were made at the APS April Meeting, virtual, 18–21 April 2020:

C. J. Forrest, G. Hale, W. U. Schröder, J. P. Knauer, P. B. Radha, V. Yu. Glebov, O. M. Mannion, Z. L. Mohamed, S. P. Regan, T. C. Sangster, A. Schwemmlein, and C. Stoeckl, "Evidence for a $^{7}$Li State at $E_X$ = 10.2 MeV from Inelastic Neutron Scattering at 14 MeV."

A. K. Schwemmlein, W. U. Schröder, C. Stoeckl, C. J. Forrest, J. P. Knauer, and S. P. Regan, "Using the Multi-Terawatt Laser at the Laboratory for Laser Energetics to Generate a High-Yield, 0.5-MeV Deuteron Beam."

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The following presentations were made at Technology of Fusion Energy (TOFE) 2020, virtual, 20–23 April 2020:

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, "Tritium Concentration Profiles in Stainless-Steel 316 Samples."

M. Sharpe, W. T. Shmayda, J. Wermer, and C. A. Bond, "Permeation Rate of Deuterium and Tritium Through Iron–Chromium–Aluminum Alloys."

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The following presentations were made at High Energy Density Science, virtual, 20–24 April 2020:

S. P. Regan, V. N. Goncharov, T. C. Sangster, R. Betti, E. M. Campbell, K. A. Bauer, M. J. Bonino, D. Cao, A. R. Christopherson, G. W. Collins, T. J. B. Collins, R. S. Craxton, D. H. Edgell, R. Epstein, P. Fan, M. Farrell, P. Fitzsimmons, C. J. Forrest, R. K. Follett, J. A. Frenje, D. H. Froula, M. Gatu Johnson, V. Yu. Glebov, V. Gopalaswamy, D. R. Harding, S. X. Hu, H. Huang, I. V. Igumenshchev, Y. Lu, R. Luo, D. W. Jacobs-Perkins, R. T. Janezic, M. Karasik, T. J. Kessler, J. P. Knauer, T. Z. Kosc, A. Lees, O. M. Mannion, J. A. Marozas, F. J. Marshall, P. W. McKenty, Z. L. Mohamed, S. F. B. Morse, P. M. Nilson, S. P. Obenschain, J. P. Palastro, D. Patel, J. L. Peebles, R. D. Petrasso, P. B. Radha, H. G. Rinderknecht, M. J. Rosenberg, S. Sampat, A. J. Schmitt, W. Seka, R. C. Shah, J. R. Rygg, J. G. Shaw, W. T. Shmayda, M. J. Shoup III, C. Shuldberg, A. Shvydky, A. A. Solodov, C. Sorce, C. Stoeckl, W. Sweet, W. Theobald, D. Turnbull, J. Ulreich, L. J. Waxer, M. D. Wittman, K. M. Woo, and J. D. Zuegel, "Laser-Direct-Drive Inertial Confinement Fusion Research on OMEGA: Current Status."

J. J. Ruby, J. R. Rygg, D. A. Chin, C. J. Forrest, V. Yu. Glebov, C. Stoeckl, N. V. Kabadi, P. Adrian, B. Bachmann, Y. Ping, J. A. Gaffney, and G. W. Collins, "Spherical Shock Wave Experiments on the OMEGA Laser."

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G. W. Collins, "Laboratory for Laser Energetics Contributions to the Stockpile Stewardship Mission," presented at the HEDP Briefing to DOE, virtual, 29 April 2019.

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The following presentations were made at CLEO 2020, virtual, 10–15 May 2020:

I. A. Begishev, V. V. Ivanov, S. Patankar, P. S. Datte, S. T. Yang, J. D. Zuegel, and J. Bromage, "Nonlinear Crystals for Efficient High-Energy Fifth-Harmonic Generation of Near-IR Lasers."

C. Dorrer, I. A. Begishev, S.-W. Bahk, and J. Bromage, "Broadband Parametric-Gain Optimization of Partially Deuterated KDP with Two-Wavelength Tuning Curves."

C. Dorrer, E. M. Hill, and T. Borger, "Record-Bandwidth Spectrally Incoherent UV Laser Pulses."

C. Dorrer, E. M. Hill, and J. D. Zuegel, "High-Efficiency Parametric Amplification of Broadband Spectrally Incoherent Pulses."

D. H. Froula, S.-W. Bahk, I. A. Begishev, R. Boni, J. Bromage, A. Davies, P. Franke, R. K. Follett, D. Haberberger, A. Howard, G. W. Jenkins, J. Katz, T. J. Kessler, J. P. Palastro, J. B. Oliver, D. Ramsey, T. Simpson, J. L. Shaw, D. Turnbull, N. Vafaei-Najafabadi, and J. Vieira, "From Chromatic to Achromatic Flying Foci."

V. Gruzdev and K. R. P. Kafka, "Ultrafast Multiphoton Absorption in Optical-Coating Materials at Near-Damage-Threshold Fluence."

E. P. Power, J. Bromage, and J. D. Zuegel, "Integrated-Flow Active Cooling for Thermal Management of Reflective Optics Under High-Average-Power Load."

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E. M. Campbell, "Direct-Drive Laser Fusion, Status, Plans, and the Future," presented at the Cornell University Talk, virtual, 11 May 2020.

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D. H. Froula, J. P. Palastro, S.-W. Bahk, I. V. Begishev, R. Boni, J. Bromage, A. Davies, P. Franke, R. K. Follett, D. Haberberger, A. Howard, G. W. Jenkins, J. Katz, T. J. Kessler, J. B. Oliver, D. Ramsey, T. Simpson, J. L. Shaw, D. Turnbull, N. Vafaei-Najafabadi, and J. Vieira, "Progress in Flying Focus for Plasma-Based Applications: From Chromatic to Achromatic Flying Foci," presented at UR Colloquia, virtual, 17 June 2020.

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E. M. Campbell, "Laboratory for Laser Energetics (LLE) Contributions to the Stockpile Stewardship Mission," presented at OES Executives Meeting, virtual, 23 June 2020.

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D. R. Harding, S. M. Fess, M. J. Bonino, R. F. Earley, T. C. Sangster, E. M. Campbell, V. N. Goncharov, J. L. Peebles, M. D. Wittman, C. Stoeckl, Y.-F. Lu, P. Fan, and X. Huang, "Laser-Based Microfabrication and Metrology of Laser-Driven Inertial Fusion Targets," presented at the 21st International Symposium on Laser Precision Microfabrication, virtual, 23–26 June 2020.

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G. W. Collins, "High Energy Density (HED) Quantum Matter," presented at the Office of Science Meeting, virtual, 29 June 2020.