Publications and Conference Presentations

Publications

R. Adam, G. Chen, D. E. Bürgler, T. Shou., I. Komissarov, S. Heidtfeld, H. Hardtdegen, M. Mikulics, C. M. Schneider, and R. Sobolewski, "Magnetically and Optically Tunable Terahertz Radiation from Ta/NiFe/Pt Spintronic Nanolayers Generated by Femtosecond Laser Pulses," Appl. Phys. Lett. **114**, 212405 (2019).

X. Bian and H. Aluie, "Decoupled Cascades of Kinetic and Magnetic Energy in Magnetohydrodynamic Turbulence," Phys. Rev. Lett. **122**, 135101 (2019).

D. Broege and J. Bromage, "Measurements of Heat Flow from Surface Defects in Lithium Triborate," Opt. Express **27**, 10,067 (2019).

D. Broege, S. Fochs, G. Brent, J. Bromage, C. Dorrer, R. F. Earley, M. J. Guardalben, J. A. Marozas, R. G. Roides, D. Weiner, J. Sethian, X. Wang, D. Weiner, J. Zweiback, and J. D. Zuegel, "The Dynamic Compression Sector Laser: A 100-J UV Laser for Dynamic Compression Research," Rev. Sci. Instrum. **90**, 053001 (2019).

A. Chien, L. Gao, H. Ji, X. Yuan, E. G. Blackman, H. Chen, P. C. Efthimion, G. Fiksel, D. H. Froula, K. W. Hill, K. Huang, Q. Lu, J. D. Moody, and P. M. Nilson, "Study of Magnetically Driven Reconnection Platform Using Ultrafast Proton Radiography," Phys. Plasmas **26**, 062113 (2019).

D. T. Cliche and R. C. Mancini, "Impact of 3D Effects on the Characteristics of a Multi-Monochromatic X-Ray Imager," Appl. Opt. **58**, 4753 (2019).

A. L. Coleman, M. G. Gorman, R. Briggs, R. S. McWilliams, D. McGonegle, C. A. Bolme, A. E. Gleason, D. E. Fratanduono, R. F. Smith, E. Galtier, H. J. Lee, B. Nagler, E. Granados, G. W. Collins, J. H. Eggert, J. S. Wark, and M. I. McMahon, "Identification of Phase Transitions and Metastability in Dynamically Compressed Antimony Using Ultrafast X-Ray Diffraction," Phys. Rev. Lett. **122**, 255704 (2019).

A. S. Davies, D. Haberberger, J. Katz, S. Bucht, J. P. Palastro, W. Rozmus, and D. H. Froula, "Picosecond Thermodynamics in Underdense Plasmas Measured with Thomson Scattering," Phys. Rev. Lett. **122**, 155001 (2019).

J. A. Delettrez, T. J. B. Collins, and C. Ye, "Determining Acceptable Limits of Fast-Electron Preheat in Direct-Drive-Ignition-Scale Target Designs," Phys. Plasmas **26**, 062705 (2019).

S. G. Demos, B. N. Hoffman, C. W. Carr, D. A. Cross, R. A. Negres, and J. D. Bude, "Mechanisms of Laser-Induced Damage in Absorbing Glasses with Nanosecond Pulses," Opt. Express **27**, 9975 (2019).

C. A. Di Stefano, F. W. Doss, A. M. Rasmus, K. A. Flippo, and B. M. Haines, "The Modeling of Delayed-Onset Rayleigh–Taylor and Transition to Mixing in Laser-Driven HED Experiments," Phys. Plasmas **26**, 052708 (2019).

L. Divol, D. P. Turnbull, T. Chapman, C. Goyon, and P. Michel, "An Analytical Study of Non-Resonant Transient Cross-Beam Power Transfer Relevant to Recent Progress in Plasma Photonics," Phys. Plasmas **26**, 043101 (2019).

A. Fernandez-Pañella, M. Millot, D. E. Fratanduono, M. P. Desjarlais, S. Hamel, M. C. Marshall, D. J. Erskine, P. A. Sterne, S. Haan, T. R. Boehly, G. W. Collins, J. H. Eggert, and P. M. Celliers, "Shock Compression of Liquid Deuterium up to 1 TPa," Phys. Rev. Lett. **122**, 255702 (2019).

R. K. Follett, J. G. Shaw, J. F. Myatt, C. Dorrer, D. H. Froula, and J. P. Palastro, "Thresholds of Absolute Instabilities Driven by a Broadband Laser," Phys. Plasmas **26**, 062111 (2019).

C. G. R. Geddes and J. L. Shaw, "Summary of Working Group 1: Laser-Plasma Wakefield Acceleration," in *2018 IEEE Advanced Accelerator Concepts Workshop (AAC 2018)* (IEEE, New York, 2018), pp. 1–5.

R. Ghosh, O. Swart, S. Westgate, B. L. Miller, and M. Z. Yates, "Antibacterial Copper–Hydroxyapatite Composite Coatings via Electrochemical Synthesis," Langmuir **35**, 5957 (2019).

M. R. Gomez, S. A. Slutz, P. F. Knapp, K. D. Hahn, M. R. Weis, E. C. Harding, M. Geissel, J. R. Fein, M. E. Glinsky, S. B. Hansen, A. J. Harvey-Thompson, C. A. Jennings, I. C. Smith, D. Woodbury, D. J. Ampleford, T. J. Awe, G. A. Chandler, M. H. Hess, D. C. Lamppa, C. E. Myers, C. L. Ruiz, A. B. Sefkow, J. Schwarz, D. A. Yager-Elorriaga, B. Jones, J. L. Porter, K. J. Peterson, R. D. McBride, G. A. Rochau, and D. B. Sinars, "Assessing Stagnation Conditions and Identifying Trends in Magnetized Liner Inertial Fusion," IEEE Trans. Plasma Sci. **47**, 2081 (2019).

P.-A. Gourdain, M. B. Adams, M. Evans, H. R. Hasson, R. V. Shapovalov, J. R. Young, and I. West-Abdallah, "Enhancing Cylindrical Compression by Reducing Plasma Ablation in Pulsed-Power Drivers," Phys. Plasmas **26**, 042706 (2019).

H. Habara, T. Iwawaki, T. Gong, M. S. Wei, S. T. Ivancic, W. Theobald, C. M. Krauland, S. Zhang, G. Fiksel, and K. A. Tanaka, "A Ten-Inch Manipulator (TIM) Based Fast-Electron Spectrometer with Multiple Viewing Angles (OU-ESM)," Rev. Sci. Instrum. **90**, 063501 (2019).

V. V. Ivanov, A. V. Maximov, R. Betti, L. S. Leal, R. C. Mancini, K. J. Swanson, I. E. Golovkin, C. J. Fontes, H. Sawada, A. B. Sefkow, and N. L. Wong, "Study of Laser Produced Plasma in a Longitudinal Magnetic Field," Phys. Plasmas **26**, 062707 (2019).

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K. R. P. Kafka and S. G. Demos, "Interaction of Short Laser Pulses with Model Contamination Microparticles on a High Reflector," Opt. Lett. **44**, 1844 (2019).

V. V. Karasiev, S. X. Hu, M. Zaghoo, and T. R. Boehly, "Exchange-Correlation Thermal Effects in Shocked Deuterium: Softening the Principal Hugoniot and Thermophysical Properties," Phys. Rev. B **99**, 214110 (2019).

V. V. Karasiev, S. B. Trickey, and J. W. Dufty, "Status of Free-Energy Representations for the Homogeneous Electron Gas," Phys. Rev. B **99**, 195134 (2019).

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S. LePape, L. Divol, A. MacPhee, J. McNaney, M. Hohenberger, D. Froula, V. Glebov, O. L. Landen, C. Stoeckl, E. Dewald, S. Khan, C. Yeamans, P. Michel, M. Schneider, J. Knauer, J. Kilkenny, and A. J. Mackinnon, "Optimization of High Energy X-Ray Production Through Laser Plasma Interaction," High Energy Density Phys. **31**, 13 (2019).

M. J.-E. Manuel, A. B. Sefkow, C. C. Kuranz, A. M. Rasmus, S. R. Klein, M. J. MacDonald, M. R. Trantham, J. R. Fein, P. X. Belancourt, R. P. Young, P. A. Keiter, B. B. Pollock, J. Park, A. U. Hazi, G. J. Williams, H. Chen, and R. P. Drake, "Magnetized Disruption of Inertially Confined Plasma Flows," Phys. Rev. Lett. **122**, 225001 (2019).

P.-E. Masson-Laborde, S. Laffite, C. K. Li, S. C. Wilks, R. Riquier, R. D. Petrasso, G. Kluth, and V. Tassin, "Interpretation of Proton Radiography Experiments of Hohlraums with Three-Dimensional Simulations," Phys. Rev. E **99**, 053207 (2019).

M. Millot, F. Coppari, J. R. Rygg, A. Correa Barrios, S. Hamel, D. C. Swift, and J. H. Eggert, "Nanosecond X-Ray Diffraction of Shock-Compressed Superionic Water Ice," Nature **569**, 251 (2019).

S. Papernov, "Spectroscopic Setup for Submicrometer-Resolution Mapping of Low-Signal Absorption and Luminescence Using Photothermal Heterodyne Imaging and Photon-Counting Techniques," Appl. Optics **58**, 3908 (2019).

J. L. Peebles, S. X. Hu, W. Theobald, V. N. Goncharov, N. Whiting, P. M. Celliers, S. J. Ali, G. Duchateau, E. M. Campbell, T. R. Boehly, and S. P. Regan, "Direct-Drive Measurements of Laser-Imprint-Induced Shock Velocity Nonuniformities," Phys. Rev. E **99**, 063208 (2019).

A. M. Rasmus, C. A. Di Stefano, K. A. Flippo, F. W. Doss, C. F. Kawaguchi, J. L. Kline, E. C. Merritt, T. R. Desjardins, T. Cardenas, D. W. Schmidt, P. M. Donovan, F. Fierro, L. A. Goodwin, J. I. Martinez, T. E. Quintana, J. S. Zingale, and C. C. Kuranz, "Shock-Driven Hydrodynamic Instability of a Sinusoidally Perturbed, High-Atwood Number, Oblique Interface," Phys. Plasmas **26**, 062103 (2019).

S. Sampat, T. Z. Kosc, K. A. Bauer, R. D. Dean, W. R. Donaldson, J. Kwiatkowski, R. Moshier, A. L. Rigatti, M. H.

Romanofsky, L. J. Waxer, and J. H. Kelly, "Power Balancing a Multibeam Laser," Proc. SPIE **10898**, 108980A (2019).

J. P. Sauppe, B. M. Haines, S. Palaniyappan, P. A. Bradley, S. H. Batha, E. N. Loomis, and J. L. Kline, "Modeling of Direct-Drive Cylindrical Implosion Experiments with an Eulerian Radiation-Hydrodynamics Code," Phys. Plasmas **26**, 042701 (2019).

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S. Zhang, A. Lazicki, B. Militzer, L. H. Yang, K. Caspersen, J. A. Gaffney, M. W. Däne, J. E. Pask, W. R. Johnson, A. Sharma, P. Suryanarayana, D. D. Johnson, A. V. Smirnov, P. A. Sterne, D. Erskine, R. A. London, F. Coppari, D. Swift, J. Nilsen, A. J. Nelson, and H. D. Whitley, "Equation of State of Boron Nitride Combining Computation, Modeling, and Experiment," Phys. Rev. B **99**, 165103 (2019).

Forthcoming Publications

S. Bucht, D. Haberberger, J. Bromage, and D. H. Froula, "A Methodology for Designing Grism Stretchers for Idler-Based Optical Parametric Chirped-Pulse–Amplification Systems," to be published in the Journal of the Optical Society of America B.

D. Cao, R. C. Shah, S. P. Regan, R. Epstein, I. V. Igumenshchev, V. Gopalaswamy, A. R. Christopherson, W. Theobald, P. B. Radha, and V. N. Goncharov, "Interpreting the Electron Temperature Inferred from X-Ray Continuum Emission for Direct-Drive Inertial Confinement Fusion Implosions on OMEGA," to be published in Physics of Plasmas.

A. Colaïtis, R. K. Follett, J. P. Palastro, I. Igumenshchev, and V. Goncharov, "Adaptive Inverse Ray-Tracing for Accurate and Efficient Modeling of Cross Beam Energy Transfer in Hydrodynamics Simulations," to be published in Physics of Plasmas.

S. G. Demos, J. C. Lambropoulos, R. A. Negres, M. J. Matthews, and S. R. Qiu, "Dynamics of Secondary Contamination from the Interaction of High-Power Laser Pulses with Metal Particles Attached on the Input Surface of Optical Components," to be published in Optics Express.

C. Dorrer, "Spatiotemporal Metrology of Broadband Optical Pulses," to be published in IEEE Journal on Selected Topics in Quantum Electronics.

G. Duchateau, S. X. Hu, A. Pineau, A. Kar, B. Chimier, A. Casner, V. Tikhonchuk, V. N. Goncharov, P. B. Radha, and E. M. Campbell, "Modeling the Solid-to-Plasma Transition for Laser Imprinting in Direct-Drive Inertial Confinement Fusion," to be published in Physical Review E.

C. Fagan, M. Sharpe, W. T. Shmayda, and W. U. Schröder, "Tritium Retention in Hexavalent Chromate-Conversion–Coated Aluminum Alloy," to be published in Fusion Science and Technology.

C. J. Forrest, A. Deltuva, W. U. Schröder, A. Voinov, J. P. Knauer, E. M. Campbell, G. W. Collins, V. Yu. Glebov, O. M. Mannion, Z. Mohamed, P. B. Radha, S. P. Regan, T. C. Sangster, and C. Stoeckl, "Deuteron Breakup Induced by 14-MeV Neutrons from Inertial Confinement Fusion," to be published in Physical Reivew C.

L. Guazzotto and R. Betti, "Two-Fluid Burning-Plasma Analysis for Magnetic Confinement Fusion Devices," to be published in Plasma Physics and Controlled Fusion.

I. V. Igumenshchev, A. L. Velikovich, V. N. Goncharov, R. Betti, E. M. Campbell, J. P. Knauer, S. P. Regan, A. J. Schmitt, R. C. Shah, and A. Shvydky, "Rarefaction Flows and Mitigation of Imprint in Direct-Drive Implosions," to be published in Physical Review Letters.

C. K. Li, V. T. Tikhonchuk, Q. Moreno, H. Sio, E. D'Humières, X. Ribeyre, Ph. Korneev, S. Atzeni, R. Betti, A. Birkel, E. M. Campbell, R. K. Follett, J. A. Frenje, S. X. Hu, M. Koenig, Y. Sakawa, T. C. Sangster, F. H. Séguin, H. Takabe, S. Zhang, and R. D. Petrasso, "Collisionless Shocks Driven by Supersonic Plasma Flows with Self-Generated Magnetic Fields," to be published in Physical Review Letters.

C. A. McCoy, M. C. Marshall, D. N. Polsin, D. E. Fratanduono, P. M. Celliers, D. D. Meyerhofer, and T. R. Boehly, "Hugoniot, Sound Velocity, and Shock Temperature of MgO to 2300 GPa," to be published in Physical Review B.

S. C. Miller, J. P. Knauer, C. J. Forrest, V. Yu. Glebov, P. B. Radha, and V. N. Goncharov, "Fuel–Shell Interface Instability Growth Effects on the Performance of Room Temperature Direct-Drive Implosions," to be published in Physics of Plasmas.

B. W. Plansinis, W. R. Donaldson, and G. P. Agrawal, "A Time-to-Frequency Converter for Measuring the Shape of Short Optical Pulses," to be published in Review of Scientific Instruments.

B. Rice, J. Ulreich, and M. J. Shoup III, "Prediction of Deuterium–Tritium Ice Layer Uniformity in Direct-Drive Confinement Fusion Target Capsules," to be published in the Proceedings of NAFEMS World Congress 2019.

E. Ruskov, V. Yu. Glebov, T. W. Darling, F. J. Wessel, F. Conti, J. C. Valenzuela, H. U. Rahman, and F. N. Beg, "Gated Liquid Scintillator Detector for Neutron Time of Flight Measurements in a Gas-Puff Z-Pinch Experiment," to be published in Review of Scientific Instruments.

B. Scheiner, M. J. Schmitt, S. C. Hsu, D. Schmidt, J. Mance, C. Wilde, D. N. Polsin, T. R. Boehly, F. J. Marshall, N. Krasheninnikova, K. Molvig, and H. Huang, "First Experiments on *Revolver* Shell Collisions at the OMEGA Laser," to be published in Physics of Plasmas.

R. V. Shapovalov, G. Brent, R. Moshier, M. J. Shoup III, R. B. Spielman, and P.-A. Gourdain, "The Design of 30-T Pulsed Magnetic Field Generator for Magnetized High-Energy-Density Plasma Experiments," to be published in Physical Review Accelerators and Beams.

M. Sharpe and C. Fagan, W. T. Shmayda, "Distribution of Tritium in the Near Surface of 316 Stainless Steel," to be published in Fusion Science and Technology.

H. Sio, O. Larroche, S. Atzeni, N. V. Kabadi, J. A. Frenje, M. Gatu Johnson, C. Stoeckl, C. Li, C. J. Forrest, V. Glebov, P. J. Adrian, A. Bose, A. Birkel, S. P. Regan, F. H. Séguin, and R. D. Petrasso, "Probing Ion Species Separation and Ion Thermal Decoupling in Shock-Driven Implosions Using Multiple Nuclear Reaction Histories," to be published in Physics of Plasmas.

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

C. Stoeckl, C. J. Forrest, V. Yu. Glebov, S. P. Regan, T. C. Sangster, W. U. Schröder, A. Schwemmlein, and W. Theobald, "A Platform for Nuclear Physics Experiments with Laser-Accelerated Light Ions," to be published in Nuclear Instruments and Methods in Physics Research B.

M. Stoeckl and A. A. Solodov, "Refining Instrument Response Functions with 3-D Monte Carlo Simulations of Differential Hard X-Ray Spectrometers," to be published in Nuclear Instruments and Methods in Physics Research A.

Conference Presentations

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

G. W. Collins, J. R. Rygg, T. R. Boehly, M. Zaghoo, D. N. Polsin, B. J. Henderson, X. Gong, L. Crandall, R. Saha, J. J. Ruby, G. Tabak, M. Huff, Z. K. Sprowal, D. A. Chin, M. K. Ginnane, P. M. Celliers, J. H. Eggert, A. Lazicki, R. F. Smith, R. Hemley, F. Coppari, B. Bachmann, J. Gaffney, D. E. Fratanduono, D. G. Hicks, Y. Ping, D. Swift, D. G. Braun, S. Hamel, M. Millot, M. Gorman, R. Briggs, S. Ali, R. Kraus, M. McMahon, P. Loubeyre, S. Brygoo, R. Jeanloz, R. Falcone, F. N. Beg, C. Bolme, A. Gleason, S. H. Glenzer, H. Lee, T. Duffy, J. Wang, J. Wark, and G. Gregori, "Extreme Matters: Pressure to Explore New Worlds and Exotic Solids," presented at the 2019 Mach Conference, Annapolis, MD, 3–5 April 2019.

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

W. R. Donaldson and Y. Zhao, "Picosecond UV Photodiodes."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

K. M. Glance, W. T. Shmayda, and M. D. Sharpe, "Using Paladium Hydride to Fill Inertial Confinement Fusion Targets."

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

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

H. G. Rinderknecht, "Summary of the EP OPAL Workshop."

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

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

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

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

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

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

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

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

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

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

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

J. R. Rygg, "Tutorial: High Pressure Physics."

M. Zaghoo, "Capabilities and Techniques for Diamond Anvil Cells."

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

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

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

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

R. Boni, "Update on Streak Tube Simulations."

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

S. P. Regan, "Neutron Imaging Systems on OMEGA."

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

T. J. B. Collins, C. Stoeckl, R. Epstein, S. Miller, O. M. Mannion, R. Betti, J. A. Delettrez, W. A. Bittle, C. J. Forrest, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, I. V. Igumenshchev, D. W. Jacobs-Perkins, R. J. Janezic, J. H. Kelly,

T. Z. Kosc, C. Milehamn, D. T. Michel, R. L. McCrory, P. W. McKenty, F. J. Marshall, S. F. B. Morse, P. B. Radha, S. P. Regan, B. Rice, T. C. Sangster, M. J. Shoup III, W. T. Shmayda, C. Sorce, W. Theobald, J. Ulreich, M. D. Wittman, J. A. Frenje, M. Gatu Johnson, and R. D. Petrasso, "Mixing at the Fuel–Ablator Interface in Backlit OMEGA Cryogenic Implosions."

C. Dorrer, "The FLUX Project."

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

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

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

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

G. Chen, R. Adam, D. E. Burgler, I. Komissarov, S. Heidtfeld, H. Hardtdegen, M. Mikulics, C. M. Schneider, and R. Sobolewski, "Ultrabroadband THz Radiation Transients Emitted from Ta/NiFe/Pt Nanolayers upon Excitation by Femtosecond Laser Pulses," presented at Frontiers in Materials Science for the 21st Century Symposium, Rochester, NY, 23 May 2019.

C. Thomas, "Laser-Direct-Drive Status and Future Plans," presented at the 28th IEEE Symposium on Fusion Engineering, Ponte Vedra Beach, FL, 2–6 June 2019.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

B. J. Henderson, T. R. Boehly, M. Zaghoo, J. R. Rygg, D. N. Polsin, X. Gong, L. Crandall, M. F. Huff, M. K. Ginnane,

G. W. Collins, S. Ali, P. M. Celliers, R. Briggs, M. Gorman, M. Marshall, and J. H. Eggert, "A Broadband Reflectance Diagnostic for Matter at Extreme Conditions."

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

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

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

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

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

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

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

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

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

D. Canning, "Formalized Incident Investigation, Reporting, and Recurrence Mitigation."

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

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

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

L. J. Waxer, "Omega Facility Overview."

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

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