PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications

H. E. Elsayed-Ali and J. W. Herman, "Picosecond Transient Surface Temperature Measurement by Reflection High-Energy Electron Diffraction," *Ultrafast Phenomena VII,* edited by C. B. Harris, E. Ippen, G. A. Mourou, and A. H. Zewail (Springer-Verlag, Berlin, 1990), Vol. 53, pp. 371–373.

H. E. Elsayed-Ali, T. Juhasz, G. O. Smith, and W. E. Bron, "Femtosecond Thermomodulation of Single-Crystalline and Polycrystalline Gold Films," *Ultrafast Phenomena VII,* edited by C. B. Harris, E. Ippen, G. A. Mourou, and A. H. Zewail (Springer-Verlag, Berlin, 1990), Vol. 53, pp. 315–317.

R. Epstein and S. Skupsky, "Anticipated Improvement in Laser Beam Uniformity Using Distributed Phase Plates with Quasirandom Patterns," *J. Appl. Phys.* **68,** 924–931 (1990).

R. Q. Gram, M. D. Wittman, C. Immesoete, H. Kim, R. S. Craxton, N. Sampat, S. Swales, G. Pien, J. M. Soures, and H. Kong, "Uniform Liquid-Fuel Layer Produced in a Cryogenic Inertial Fusion Target by a Time-Dependent Thermal Gradient," *J. Vac. Sci. Technol. A* **8,** 3319 (1990).

H. L. Helfer, "Of Martian Atmospheres, Oceans, and Fossils," *Icarus* **87,** 228–235 (1990).

C. Immesoete, S. Scarantino, H. Kim, and L. Forsley, "Computer-Assisted Microballoon Selection for Inertial Confinement Fusion Targets," *J. Vac. Sci. Technol. A* **8,** 3324–3326 (1990).

J.-C. Lee, S. D. Jacobs, T. Gunderman, A. Schmid, T. J. Kessler, and M. D. Skeldon, "TEM_{00}-Mode and Single-Longitudinal-Mode Laser Operation with a Cholesteric Liquid-Crystal Laser End Mirror," *Opt. Lett.* **15,** 959–961 (1990).

G. G. Luther and C. J. McKinstrie, "Transverse Modulational Instability of Collinear Waves," *J. Opt. Soc. Am. B* **7,** 1125–1141 (1990).

B. Yaakobi, T. Boehly, and P. Audebert, "Focusing X-Ray Spectrograph for Laser Fusion Studies," *Rev. Sci. Instrum.* **61,** 1915–1919 (1990).

B. Yaakobi, D. K. Bradley, F. J. Marshall, J. P. Knauer, J. M. Soures, and C. P. Verdon, "Absorption Lines Analysis of Laser Imploded Targets," *Opt. Commun.* **77,** 167–173 (1990).

Forthcoming Publications

S. H. Batha, D. D. Meyerhofer, A. Simon, and R. P. Drake, "Enhanced Scattering from Laser-Plasma Interactions," to be published in *Physics of Fluids*.

T. Boehly, R. S. Craxton, R. Epstein, M. Russotto, and B. Yaakobi, "X-Ray Lasing in Thick Foil Irradiation Geometry," to be published in *Optics Communications*.

T. Boehly, M. Russotto, R. S. Craxton, R. Epstein, B. Yaakobi, L. B. DaSilva, J. Nilsen, E. A. Chandler, D. J. Fields, B. J. MacGowan, D. L. Matthews, J. H. Scofield, and G. Shimkaveg, "Demonstration of a Narrow Divergence X-Ray Laser in Neon-Like Titanium," to be published in *Physical Review A*.

S. H. Chen and M. L. Tsai, "New Thermotropic Chiral Nematic Copolymers Using (1S, 2S, 3S, 5R)-(+)- and (1R, 2R, 3R, 5S)-(-)-Isopinocampheol as Building Blocks," to be published in *Macromolecules*.

H. C. Chen, G. Mourou, and R. Knox, "Time-Resolved Electron Diffraction from Pulse-Excited Crystalline Gold Films," to be published in the *Proceedings of 1989 Materials Research Society Fall Meeting: Beam-Solid Interactions,* Boston, MA, 27 November–2 December 1989; and in *Physical Review Letters*.

P. C. Cheng, V. H.-K. Chen, H. Kim, and R. E. Pearson, "A Real-Time EPI-Fluorescent Confocal Microscope," to be published in *Journal of Microscopy*.

P. C. Cheng, V. H.-K. Chen, H. Kim, and R. E. Pearson, "An EPI-Fluorescent Spinning-Disk Confocal Microscope," to be published in the *Proceedings of the 47th Annual Meeting of Electron Microscopy Society of America* (EMSA), Austin, TX, 14–18 August 1989.

H. E. Elsayed-Ali and J. W. Herman, "Picosecond Time-Resolved Surface-Lattice Temperature Probe," to be published in *Applied Physics Letters.*

H. E. Elsayed-Ali, T. Juhasz, G. O. Smith, and W. E. Bron, "Femtosecond Thermoreflectivity and Thermotransmissivity of Polycrystalline and Single-Crystalline Gold Films," to be published in *Physical Review B.*

E. M. Epperlein, "Electron Kinetics in Laser-Driven Inertial Confinement Fusion," to be published in the *Proceedings of the Topical Conference on Research Trends in Nonlinear and Relativistic Effects in Plasmas,* La Jolla, CA, 5–8 February 1990.

E. M. Epperlein, "Kinetic Theory of Laser Filamentation in Plasmas," to be published in *Physical Review Letters.*

R. Epstein, "Satellite Absorption Lines and the Temperature Dependence of X-Ray Absorption Features in High-Temperature Plasmas," to be published in *Physical Review A.*

S. D. Jacobs, "Optical Materials: Improved Building Blocks for Better Lasers," to be published in *Chemtech.*

H. Kim, C. K. Immesoete, and S. Scarantino, "Computer-Assisted Microballoon Selection for Inertial Fusion Targets," to be published in the *Proceedings of the Seventh Target Fabrication Specialists Meeting,* Livermore, CA, 25–29 September 1989.

H. Kim, R. Q. Gram, M. D. Wittman, C. Immesoete, R. S. Craxton, N. Sampat, S. Swales, G. Pien, and J. M. Soures, "Uniform Liquid Fuel Layer Produced in a Cryogenic Target by a Time-Dependent Thermal Gradient," to be published in the *Proceedings of the Seventh Target Fabrication Specialists Meeting,* Livermore, CA, 25–29 September 1989.

L. E. Kingsley and W. R. Donaldson, "Electro-Optic Imaging of Surface Electric Fields in High-Power Photoconductive Switches," to be published in *IEEE Transactions on Electron Devices.*

J. C. Lambropoulos and S.-S. Hwang, "Film Thermal Conductivity and Laser Damage Resistance of Optical Thin Films," to be published in the *Proceedings of a Symposium on Electro-Optics and Non-Linear Optics,* 1st International Congress on Ceramic Science and Technology, Anaheim, CA, 1–3 November 1989.

J.-C. Lee and S. D. Jacobs, "Design and Construction of 1064 nm Liquid Crystal Laser Cavity End Mirrors," to be published in *Applied Physics Letters.*

J.-C. Lee, S. D. Jacobs, and K. J. Skerrett, "Laser Beam Apodizer Utilizing Gradient-Index Optical Effects in Liquid Crystals," to be published in *Optical Engineering*.

G. G. Luther, C. J. McKinstrie, and A. L. Gaeta, "The Transverse Modulational Instability of Counterpropagating Light Waves," to be published in the *Proceedings of the Topical Meeting on Nonlinear Dynamics in Optical Systems*, Afton, OK, 4–8 June 1990.

R. L. McCrory, "New Research Trends in Inertial Confinement Fusion," to be published in the *Proceedings of the Topical Conference on Research Trends in Nonlinear and Relativistic Effects in Plasmas*, La Jolla, CA, 5–8 February 1990.

R. L. McCrory and C. P. Verdon, "Computer Modeling and Simulation in Inertial Confinement Fusion," to be published in *Il Nuovo Cimento*.

R. L. McCrory and C. P. Verdon, "Inertial Confinement Fusion: Computer Simulation," to be published as a book chapter in *Computer Applications of Plasma Science and Engineering*.

R. L. McCrory, J. M. Soures, J. Knauer, S. Letzring, F. J. Marshall, S. Skupsky, W. Seka, C. Verdon, D. Bradley, R. S. Craxton, J. Delettrez, R. Epstein, P. Jaanimagi, R. Keck, T. Kessler, H. Kim, R. Kremens, P. W. McKenty, R. Short, and B. Yaakobi, "Direct-Drive Implosion Experiments at the Laboratory for Laser Energetics," to be published in the *Proceedings of the Thirteenth International Conference on Plasma Physics and Controlled Nuclear Fusion Research*, Washington, DC, 1–6 October 1990.

P. W. McKenty, C. P. Verdon, S. Skupsky, R. L. McCrory, D. K. Bradley, W. Seka, and P. A. Jaanimagi, "Numerical Modeling of Effects of Power Imbalance on Irradiation Nonuniformities," to be published in the *Journal of Applied Physics*.

C. J. McKinstrie and R. Bingham, "Stimulated Raman Forward Scattering and the Relativistic Modulational Instability of Light Waves in Rarefied Plasma," to be published in *Physics of Fluids B*.

Conference Presentations

The following presentations were made at the SPIE/1990 International Symposium on Optical and Optoelectron Applied Science and Engineering: Advanced Optical Production Technology, San Diego, CA, 8–13 July 1990:

D. Golini and S. D. Jacobs, "Transition Between Brittle and Ductile Mode in Loose Abrasive Grinding of ULE."

P. A. Jaanimagi and C. Hestdalen, "Streak Camera Phosphors: Response to Ultra-Short Excitation."

The following presentations were made at the 20th Annual Anomalous Absorption Conference, Traverse City, MI, 9–13 July 1990:

T. Boehly, M. Russotto, R. Epstein, R. S. Craxton, B. Yaakobi, B. MacGowan, L. DaSilva, J. Nilsen, E. Chandler, D. Matthews, and M. Eckhart, "Experiments in Photo-Pumped X-Ray Lasers."

D. K. Bradley, J. A. Delettrez, P. A. Jaanimagi, and C. P. Verdon, "The Effect of Smoothing by Spectral Dispersion (SSD) on Burnthrough Measurements Using the OMEGA Laser System."

Y.-H. Chuang and D. D. Meyerhofer, "Suppression of the Pedestal and Pre-Pulse in a Chirped-Pulse-Amplification Laser."

Y.-H. Chuang, H. Chen, S. Uchida, and D. D. Meyerhofer, "Initial Laser-Plasma Formation."

R. S. Craxton, W. Seka, and D. L. Brown, "Optical Probing Diagnostics for the OMEGA Upgrade."

J. Delettrez, H. Chen, E. Epperlein, D. D. Meyerhofer, and S. Uchida, "Effects of Nonlocal Thermal and Suprathermal Electron Transport in Simulations of 1-ps Laser Pulse Interaction."

E. Epperlein, "Kinetic Theory of Laser Beam Thermal Filamentation in Plasmas."

R. Epstein, "Satellite Absorption Lines and the Temperature Dependence of X-Ray Absorption Features in High-Temperature Plasmas."

G. G. Luther, C. J. McKinstrie, and A. L. Gaeta, "Transverse Modulational Instability of Counterpropagating Waves and Conical Radiation."

C. J. McKinstrie, L. Mu, M. Yum, and R. Bingham, "Stimulated Raman Forward Scattering and the Relativistic Modulational Instability of Light Waves in Rarefied Plasma."

D. D. Meyerhofer, D. Bradley, Y.-H. Chuang, H. Chen, J. Delettrez, R. Epstein, P. Jaanimagi, S. Uchida, and B. Yaakobi, "Results from High-Intensity, 1 ps, Laser-Plasma Interaction Experiments."

K. Mizuno, W. Seka, R. Bahr, R. P. Drake, and J. S. DeGroot, "Development of a Collective Thomson Scattering Diagnostic Using the Ion Acoustic Decay Instability."

W. Seka, R. S. Craxton, R. Bahr, D. Bradley, P. Jaanimagi, J. Knauer, S. Letzring, D. Meyerhofer, S. Morse, R. W. Short, A. Simon, C. Verdon, and J. M. Soures, "Long Scale Length Interaction Experiments on OMEGA."

R. W. Short, "Filamentation of Obliquely Incident Laser Light in Inhomogeneous Plasmas."

A. Simon, "Caviton Burnout, the Bump-on-Tail Electron Velocity Distribution, and Fast Ion Beams."

S. Uchida, H. Chen, Y.-H. Chuang, J. Delettrez, and D. D. Meyerhofer, "Hot Electron Energy Transport in Picosecond Laser-Plasma Interactions."

The following presentations were made at the X-Ray Microscopy 1990 Conference, London, England, 3–7 September 1990:

P. C. Cheng and H. Kim, "The Study of Silica Deposition in Maize by X-Ray Microradiography and Confocal Light Microscopy."

H. Kim, B. Yaakobi, J. M. Soures, and P. C. Cheng, "Laser-Produced Plasma as a Light Source for X-ray Microscopy."

J. Delettrez, "Simulation of Short-Pulse Interaction," presented at the 1990 CECAM Workshop, Orsay, France, 10–12 September 1990.

T. Boehly, M. Russotto, B. Yaakobi, R. Epstein, R. S. Craxton, L. DaSilva, J. Nilsen, B. MacGowan, G. Shimkaveg, A. R. Fry, E. Chandler, D. Matthews, and M. Eckart, "Demonstration of a Resonantly Photo-Pumped X-Ray Laser," presented at the 2nd International Colloquium on X-Ray Lasers, York, England, 17–21 September 1990.

P. A. Jaanimagi, C. Hestdalen, J. Kelly, and W. Seka, "High Precision Measurements of the 24-Beam UV OMEGA Laser," presented at the 19th International SPIE Congress on High-Speed Photography and Photonics, Cambridge, England, 17–21 September 1990.

D. D. Meyerhofer, S. Augst, C. Moore, J. Peatross, J. H. Eberly, and S. L. Chin, "Barrier Suppression Ionization and High-Order Harmonic Generation in Noble Gases at Laser Intensities of 1 Atomic Unit and Above," presented at the International Conference on Multiphoton Processes (ICOMP V), Paris, France, 24–28 September 1990.

ACKNOWLEDGMENT

The work described in this volume includes current research at the Laboratory for Laser Energetics, which is supported by Empire State Electric Energy Research Corporation, New York State Energy Research and Development Authority, Ontario Hydro, the University of Rochester, and the U.S. Department of Energy Division of Inertial Fusion under agreement No. DE-FC03-85DP40200.