

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications

S. Augst, D. D. Meyerhofer, C. I. Moore, and J. Peatross, "Tunneling Ionization and Harmonic Generation in Krypton Gas Using a High-Intensity, 1- μm , 1-ps Laser," *Femtosecond to Nanosecond High-Intensity Lasers and Applications* (SPIE, Bellingham, WA, 1990), Vol. 1229, pp. 152–158.

G. Banas, F. V. Lawrence, Jr., J. M. Rigsbee, and H. E. Elsayed-Ali, "Laser Shock Hardening of Welded Maraging Steel," in *Surface Engineering: Current Trends and Future Prospects*, edited by S. A. Meguid (Elsevier Applied Science, London and New York, 1990), pp. 280–290.

H. Chen, Y.-H. Chuang, R. Epstein, D. D. Meyerhofer, S. Uchida, and B. Yaakobi, "Spectroscopic Investigation of Plasma Produced with High-Intensity, 1- μm , 1-ps Laser Pulses," *Femtosecond to Nanosecond High-Intensity Lasers and Applications* (SPIE, Bellingham, WA, 1990), Vol. 1229, pp. 182–189.

P. C. Cheng, S. P. Newberry, H. Kim, M. D. Wittman, and S. Hwang, "X-Ray Microradiography and Shadow Projection X-Ray Microscopy," in *Modern Microscopy*, edited by P. J. Duke and A. G. Michette (Plenum Publishing Corporation, New York, 1990), pp. 87–118.

J. Delettrez, D. K. Bradley, P. A. Jaanimagi, and C. P. Verdon, "Effect of Barrier Layers in Burnthrough Experiments with 351-nm Laser Illumination," *Phys. Rev. A* **41**, 5583–5593 (1990).

H. E. Elsayed-Ali, "Comment on 'Thermal Response of Metals to Ultrashort-Pulse Laser Excitation'," *Phys. Rev. Lett.* **64**, 1846 (1990).

H. E. Elsayed-Ali and J. W. Herman, "Transient Surface Debye-Waller Effect" (invited paper), *Picosecond and Femtosecond Spectroscopy from Laboratory to Real World* (SPIE, Bellingham, WA, 1990), Vol. 1209, pp. 76–85.

H. E. Elsayed-Ali and J. W. Herman, "Ultrahigh Vacuum Picosecond Laser-Driven Electron Diffraction System," *Rev. Sci. Instrum.* **61**, 1636–1647 (1990).

C. J. McKinstrie and G. G. Luther, "The Modulational Instability of Colinear Waves," *Phys. Scr.* **30**, 31–40 (1990).

D. D. Meyerhofer, H. Chen, Y.-H. Chuang, J. Delettrez, R. Epstein, S. Uchida, and B. Yaakobi, "High Intensity, Short-Pulse (1-ps), Laser-Plasma Interaction at 1 μm ," *Femtosecond to Nanosecond High-Intensity Lasers and Applications* (SPIE, Bellingham, WA, 1990), Vol. 1229, pp. 119–127.

T. B. Norris, X. J. Song, G. Wicks, W. J. Schaff, L. F. Eastman, and G. A. Mourou, "Electric Field Dependence of the Tunneling Escape Time of Electrons from a Quantum Well," in *OSA Proceedings on Picosecond Electronics and Optoelectronics*, edited by T. C. L. G. Sollner and D. M. Bloom (OSA, Washington, DC, 1989), Vol. 4, pp. 121–123.

T. B. Norris, N. Vodjdani, B. Vinter, C. Weisbuch, and G. A. Mourou, "Time-Resolved Observation of Luminescence from a Charge-Transfer State in Double Quantum Wells," in *OSA Proceedings on Picosecond Electronics and Optoelectronics*, edited by T. C. L. G. Sollner and D. M. Bloom (OSA, Washington, DC, 1989), Vol. 4, pp. 106–109.

M. Pessot, J. Squier, G. Mourou, and D. J. Harter, "Amplification of 100 fs mJ Pulses in Alexandrite Using Chirped Pulse Techniques," in *OSA Proceedings on Tunable Solid State Lasers*, edited by M. L. Shand and H. P. Jenssen (OSA, Washington, DC, 1989), Vol. 5, pp. 44–49.

Forthcoming Publications

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

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*.

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 Transient Surface Temperature Measurement by Reflection High-Energy Electron Diffraction," to be published in the *Proceedings of the Topical Meeting on Ultrafast Phenomena*, Monterey, CA, 14–17 May 1990.

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 Thermorefectivity and Thermotransmissivity of Polycrystalline and Single-Crystalline Gold Films," to be published in *Physical Review Letters*.

H. E. Elsayed-Ali, T. Juhasz, G. O. Smith, and W. E. Bron, "Femtosecond Thermomodulation of Single-Crystalline and Polycrystalline Gold Films," to be published in the *Proceedings of the Topical Meeting on Ultrafast Phenomena*, Monterey, CA, 14–17 May 1990.

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

R. Epstein and S. Skupsky, "Anticipated Improvement in Laser Beam Uniformity Using Distributed Phase Plates with Quasi-Random Patterns," to be published in *Journal of Applied Physics*.

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," to be published in *Journal of Vacuum Science and Technology A*.

C. Immesoete, S. Scarantino, H. Kim, and L. Forsley, "Computer-Assisted Microballoon Selection for Inertial Confinement Fusion Targets," to be published in *Journal of Vacuum Science and Technology 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, S. D. Jacobs, and K. J. Skerrett, "Laser Beam Apodizer Utilizing Gradient-Index Optical Effects in Liquid Crystals," to be published in *Optical Engineering*.

J. C. Lee, S. D. Jacobs, T. Gunderman, A. Schmid, T. J. Kessler, and M. D. Skeldon, "TEM₀₀ Mode and Single Longitudinal Mode Laser Operation with a Cholesteric Liquid Crystal Laser End Mirror," to be published in *Optics Letters*.

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*.

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 *Journal of Applied Physics*.

Conference Presentations

The following presentations were made at the Eighth APS Topical Conference on High-Temperature Plasma Diagnostics, Hyannis, MA, 6–10 May 1990:

T. J. Kessler, "ICF Laser Beam Focal Uniformity and Diagnostics."

M. Russotto and R. Kremens, "Measurement of Fuel Ion Temperatures in ICF Implosions Using Current-Mode Neutron Time-of-Flight Detectors."

R. C. Leary, "The OMEGA Laser Alignment System: A Real-Time VMS Application," presented at the US DECUS Spring 1990 Symposium, New Orleans, LA, 7–11 May 1990.

R. J. Hutchison and S. A. Kumpan, "Vendor and Subcontractor Management," presented at the OSA Regional Engineering Workshop, Rochester, NY, 10–11 May 1990.

The following presentations were made at the Seventh Topical Meeting on Ultrafast Phenomena, Monterey, CA, 14–17 May 1990:

H. E. Elsayed-Ali and J. W. Herman, "Picosecond Transient Surface Temperature Measurement by Reflection High-Energy Electron Diffraction."

H. E. Elsayed-Ali, T. Juhasz, G. O. Smith, and W. E. Bron, "Femtosecond Thermorefectivity and Thermotransmissivity of Polycrystalline and Single-Crystalline Gold Films."

H. E. Elsayed-Ali, T. Juhasz, G. O. Smith, and W. E. Bron, "Femtosecond Thermomodulation of Single-Crystalline and Polycrystalline Gold Films."

D. D. Meyerhofer, "Observation of Barrier Suppression Ionization at Laser Intensities of 1 Atomic Unit," presented at the APS Division Meeting (invited talk), Monterey, CA, 21–23 May 1990.

S. Augst, D. D. Meyerhofer, J. Peatross, C. I. Moore, and J. H. Eberly, "Harmonic Generation in Noble Gases Using a High-Intensity 1- μm , 1-ps Laser," presented at IQEC '90, Anaheim, CA, 21–25 May 1990.

The following presentations were made at CLEO, Anaheim, CA, 21–26 May 1990:

H. E. Elsayed-Ali, T. Juhasz, and G. O. Smith, "Femtosecond Transient Thermomodulation of Thin Gold Films with Different Crystal Structures."

T. E. Gunderman, J.-C. Lee, T. J. Kessler, S. D. Jacobs, D. J. Smith, and S. Skupsky, "Liquid Crystal Distributed Polarization Rotator for Improved Uniformity of Focused Laser Light."

L. E. Kingsley and W. R. Donaldson, "Optical Probing of Semiconductor Carrier Dynamics."

Y. Lin, W. Seka, T. Kessler, W. Beich, D. Y. Park, H. Huang, and J. H. Eberly, "Properties of Realistic Bessel Beams."

G. G. Luther, C. J. McKinstrie, and A. L. Gaeta, "The Transverse Modulational Instability of Counterpropagating Light Waves," presented at the Topical Meeting on Nonlinear Dynamics in Optical Systems, Afton, OK, 4-8 June 1990.

The following presentations were made at the OSA Topical Meeting on Science of Optical Finishing, Monterey, CA 10-12 June 1990:

D. Golini and S. D. Jacobs, "Chemo-Mechanical Effects in Loose Abrasive Grinding of ULE."

S. D. Jacobs, "Unconventional Polishing" (invited talk).

A. Lindquist, S. D. Jacobs, and A. Feltz, "Surface Preparation Technique for Rapid Measurement of Sub-Surface Damage Depth."

G. Banas, F. V. Lawrence Jr., J. M. Rigsbee, and H. E. Elsayed-Ali, "Mechanical and Microstructural Modification of Welded Maraging Steel after Laser Shock Hardening," presented at MatTech '90, the First European East-West Symposium on Materials and Processes, Helsinki, Finland, 10-18 June 1990.

D. D. Meyerhofer, S. Augst, D. Strickland, and S. L. Chin, "Observation of Barrier Suppression Ionization at Laser Intensities of 1 Atomic Unit," presented at the Conference on Coherent Radiation Processes in Strong Fields, Washington, DC, 18-22 June 1990.

G. Banas, F. V. Lawrence, Jr., J. M. Rigsbee, and H. E. Elsayed-Ali, "Laser Shock Hardening of Welded Maraging Steel," presented at symposium on Surface Engineering: Current Trends and Future Prospects, University of Toronto, Toronto, Canada, 25-27 June 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.