

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications

H. L. Helfer and R. L. McCrory, "Some Properties of a Polarized OCP," in *Strongly Coupled Plasma Physics*, edited by F. J. Rogers and H. E. DeWitt (Plenum, NY, 1987), pp. 41-44.

R. L. McCrory, "Industry and University Roles in Fusion Development – Panel Discussion," *J. Fusion Energy* **6**, 184-187 (1987).

D. R. Dykaar, R. Sobolewski, T. Y. Hsiang, and G. A. Mourou, "Response of a Josephson Junction to a Stepped Voltage Pulse," *IEEE Trans. Magn.* **MAG-23**, 767-770 (1987).

S. H. Batha and C. J. McKinstrie, "Temporal Energy Cascading in the Beat-Wave Accelerator," *IEEE Trans. Plasma Sci.* **PS-15**, 131-133 (1987).

C. M. Brown, J. O. Ekberg, U. Feldman, J. F. Seely, M. C. Richardson, F. J. Marshall, and W. E. Behring, "Transitions in Lithiumlike Cu^{26+} and Berylliumlike Cu^{25+} of Interest for X-Ray Laser Research," *J. Opt. Soc. Am. B* **4**, 533-538 (1987).

R. A. Lawton and K. Meyer, "Waveform Standards for Electro-Optics: A Pulse Duration Comparison," *IEEE Trans. Microwave Theory Tech.* **MTT-35**, 450-453 (1987).

P. Bado, M. Bouvier, and J. S. Coe, "Nd:YLF Mode-Locked Oscillator and Regenerative Amplifier," *Opt. Lett.* **12**, 319-321 (1987).

M. Pessot, P. Maine, and G. Mourou, "1000 Times Expansion/Compression of Optical Pulses for Chirped Pulse

Amplification," *Opt. Commun.* **62**, 419-421 (1987).

J. S. Wark, R. R. Whitlock, A. Hauer, J. E. Swain, and P. J. Solone, "Shock Launching in Silicon Studied with Use of Pulsed X-Ray Diffraction," *Phys. Rev. B* **35**, 9391-9394 (1987).

M. A. Loudiana, J. T. Dickinson, A. Schmid, and E. J. Ashley, "Electron Enhanced Sorption of Fluorine by Silver Surfaces," *Appl. Surf. Sci.* **28**, 311-322 (1987).

Forthcoming Publications

The following papers are to be published in the *Proceedings of the 17th Annual Boulder Damage Symposium*, Boulder, CO, October 1985:

K. A. Cerqua, S. D. Jacobs, B. L. McIntyre, and W. Zhong, "Ion Exchange Strengthening of Nd-Doped Phosphate Laser Glass."

B. Liao, D. J. Smith, and B. L. McIntyre, "The Development of Nodular Defects in Optical Coatings."

D. J. Smith, B. Krakauer, C. J. Hayden, A. W. Schmid, and M. J. Guardalben, "Yttrium-Oxide-Based Anti-Reflection Coating for High Power Lasers at 351 nm."

B. Yaakobi, "X-Ray Diagnostic Methods for Laser-Imploded Targets" and "Thermal Transport, Mass Ablation, and Preheat in Laser-Target Experiments," to be published in the *Proceedings of the Spring College on Radiation in Plasmas*, Trieste, Italy, June 1985 (World Scientific Publishing Co.).

G. Mourou, "Picosecond Electro-Optic Sampling," to be published in the *Proceedings of the High Speed Electronics Conference*, Stockholm, Sweden, August 1986.

S. M. Gracewski and R. Q. Gram, "Analysis of Forces on ICF Targets During Ablation Layer Coating," to be published in the *Journal of Vacuum Science and Technology*.

K. A. Cerqua, S. D. Jacobs, and A. Lindquist, "Ion-Exchange Strengthened Phosphate Laser Glass: Development and Applications," to be published in the *Journal of Non-Crystalline Solids*.

K. A. Cerqua, A. Lindquist, S. D. Jacobs, and J. Lambropoulos, "Strengthened Glass for High-Average-Power Laser Applications," to be published in the *Proceedings of SPIE's O-E LASE 1987 Conference*.

H. Kim and M. Wittman, "X-Ray Microscopy of Inertial Fusion Targets Using a Laser-Produced Plasma as an X-Ray Source," to be published in the *Journal of Vacuum Science and Technology*.

H. E. Elsayed-Ali and G. A. Mourou, "Phase Transitions in the Picosecond Time Domain," to be published in the *Proceedings of the 1986 Materials Research Society Meeting*, Boston, MA, December 1986.

W. R. Donaldson, "High-Speed, High-Repetition-Rate, High-Voltage Photoconductive Switching," to be published in the *Proceedings of the 2nd Topical Meeting on Picosecond Electronics and Optoelectronics*, Lake Tahoe, NV, January 1987.

G. Mourou, K. Meyer, J. Whitaker, M. Pessot, R. Grondin, and C. Caruso, "Ultrafast Optics Applied to Modern Device Research," to be published in the *Proceedings of the 2nd Topical Meeting on Picosecond Electronics and Optoelectronics*, Lake Tahoe, NV, January 1987.

R. W. Short, W. Seka, and R. Bahr, "Stimulated Raman Scattering in Self-Focused Light Filaments in Laser-Produced Plasmas," to be published in *Physics of Fluids*.

J. Delettrez, R. Epstein, M. C. Richardson, P. A. Jaanimagi, and B. L. Henke, "Effect of Laser Illumination Nonuniformity on the Analysis of Time-Resolved X-Ray Measurements in UV Spherical Transport Experiments," to be published in *Physical Review A*.

R. L. McCrory and J. M. Soures, "Inertially Confined Fusion," to be published in *Applications of Laser Plasmas*, Chapter 7.

K. A. Cerqua, J. Hayden, and W. C. LaCourse, "Stress Measurements in SOL-GEL Films," to be published in the *Journal of Non-Crystalline Solids*.

J. F. Whitaker, R. Sobolewski, D. R. Dykaar, T. Y. Hsiang, and G. A. Mourou, "Propagation Model for Ultrafast Signals on Superconducting Dispersive Striplines," to be published in a special issue of *IEEE Transactions on Microwave Theory and Techniques*.

T. Jackson, J. Nees, R. Vallee, and G. Mourou, "A Novel Method for Ultrahigh Frequency Electro-Optic Time-Domain Reflectometry," to be published in *Electronics Letters*.

T. Y. Hsiang, J. F. Whitaker, R. Sobolewski, D. R. Dykaar, and G. A. Mourou, "Propagation Characteristics of Picosecond Electrical Transients on Coplanar Striplines," to be published in *Applied Physics Letters*.

J. C. Lee, S. D. Jacobs, and A. Schmid, "Retro-Self-Focusing and Pinholing Effect in a Cholesteric Liquid Crystal," to be published in *Molecular Crystals and Liquid Crystals*.

Conference Presentations

A. Simon and R. W. Short, "Enhanced Noise and Raman Scattering in Plasma," presented at the 1987 International Conference on Plasma Physics, Kiev, USSR, April 1987 (invited paper).

G. A. Mourou, "Generation and Application of Femtosecond Optical Pulses," presented at Electro Optics/Laser '87, Tokyo, Japan, April 1987.

B. Yaakobi, "X-Ray Laser and Gamma Ray Laser Studies at the Laboratory for Laser Energetics," presented at the American Physical

Society, Washington, D. C., April 1987 (invited paper).

The following presentations were made at CLEO '87 Conference, Baltimore, MD, 27 April–1 May 1987:

T. Kessler, S. Skupsky, W. Seka, L. Feinberg, S. Jacobs, K. Marshall, N. Sampat, D. J. Smith, and S. Swales, "High-Power Glass Laser Phase Control."

J. H. Kelly, D. L. Smith, J. C. Lee, S. D. Jacobs, D. J. Smith, J. C. Lambropoulos, and M. J. Shoup III, "Active Mirror Geometry, Nd³⁺:Cr³⁺:GSGG Amplifier."

W. Donaldson, L. Kingsley, K. Meyer, and C. Bamber, "Semiconductor Contact Characterization Using Electro-Optic Sampling."

M. C. Richardson, P. Audebert, J. Delettrez, R. Epstein, P. Jaanimagi, R. Kremens, F. Marshall, P. McKenty, R. McCrory, S. Skupsky, W. Seka, J. Soures, C. Verdon, and J. Wark, "Polymer Shell Implosions."

P. Bado and J. S. Coe, "Nd:YLF: Demonstration of a cw-Pumped Actively Modelocked Oscillator-Regenerative Amplifier Source."

P. Maine, D. Strickland, M. Bouvier, and G. Mourou, "Amplification of Picosecond Pulses to the Terawatt Level by Chirped Pulse Amplification and Compression."

M. Pessot, P. Maine, and G. Mourou, "1000 Times Expansion/Compression System for Chirped Pulse Amplification," presented at IQEC '87, Baltimore, MD, 26 April–1 May 1987.

G. A. Mourou, "Electro-Optic Sampling Technique and Its Application to Components and Circuit Characterization," presented at ECS Symposium on Beam Testing, Philadelphia, PA, May 1987.

The following presentations were made at the 18th European Conference on Laser Interaction with Plasma, Prague, Czechoslovakia, May 1987:

R. L. McCrory, "Ultra-High Pressure, Direct-Drive, Ablative Compression."

W. Seka, T. J. Kessler, S. Skupsky, F. J. Marshall, P. A. Jaanimagi, M. C. Richardson, J. M. Soures, C. P. Verdon, and R. Bahr, "Uniformity of Illumination in Direct-Drive Laser Fusion."

The following presentations were made at the 17th Annual Anomalous Absorption Conference, Tahoe City, CA, May 1987:

P. Audebert, T. Boehly, D. Bradley, R. S. Craxton, R. Epstein, M. C. Richardson, D. Shvarts, and B. Yaakobi, "The Spectroscopic Study of Single and Double Ni Foils for X-Ray Laser Studies."

S. H. Batha, L. M. Goldman, W. Seka, and A. Simon, "Observations of Enhanced Thomson Scattering."

T. Boehly, P. Audebert, D. Bradley, R. S. Craxton, R. Epstein, M. C. Richardson, D. Shvarts, and B. Yaakobi, "An Experimental Study of Single and Double Foils for X-Ray Laser Media."

- J. Delettrez, G. Gregory, P. Jaanimagi, T. Kessler, M. C. Richardson, and S. Skupsky, "Effects of Illumination Nonuniformities on the Interpretation of Streak Imaging of Glass Microballoon Implosions."
- R. Epstein, D. Shvarts, S. Skupsky, and B. Yaakobi, "The Design and Optimization of Recombination X-Ray Lasers."
- L. M. Goldman, "Effect of Mixing on Interpretation of Reaction Product Measurement of ρR ."
- R. W. Short and A. Simon, "Absolute Stimulated Raman Backscatter at High Laser Intensities."
- A. Simon, R. W. Short, W. Seka, and L. M. Goldman, "Alternative Analysis of CO₂-Laser-Produced Plasma Waves."
- A. Simon and R. W. Short, "Enhanced Thompson Scattering in Underdense Targets."
- D. Shvarts, M. C. Richardson, B. Yaakobi, P. Audebert, T. Boehly, D. Bradley, R. S. Craxton, R. Epstein, R. L. McCrory, and J. M. Soures, "Studies on High-Density Plasma Waveguides for X-Ray Lasers."
- D. Havazelet, D. Shvarts, and S. Skupsky, "Simulation of Thermal and Ponderomotive Self-Focusing in Long-Scale-Length Coronas."
- D. K. Bradley, P. Audebert, J. Delettrez, R. Epstein, G. Gregory, B. L. Henke, P. A. Jaanimagi, M. C. Richardson, and B. Yaakobi, "Time-Resolved Spectroscopy of Laser-Driven Spherical Targets."
- P. A. Jaanimagi, G. G. Gregory, D. K. Bradley, J. Delettrez, F. J. Marshall, P. W. McKenty, M. C. Richardson, and C. P. Verdon, "Time-Resolved X-Ray Diagnosis of the Acceleration Phase of ICF Implosions."
- F. J. Marshall, P. A. Jaanimagi, M. C. Richardson, C. Rapp, S. Morse, R. Hutchison, S. Noyes, T. Kessler, and W. Seka, "Uniformity of Direct-Drive Laser Illumination Measured by X-Ray Imaging."
- M. C. Richardson, P. Audebert, D. Bradley, J. Delettrez, G. G. Gregory, P. A. Jaanimagi, R. Keck, R. Kremens, F. J. Marshall, R. L. McCrory, P. W. McKenty, J. M. Soures, and C. P. Verdon, "High-Density Direct-Drive Gas-Filled Target Implosions."
- R. S. Craxton, "The Application of Ray-Tracing Techniques to Laser-Plasma Simulations," (invited talk).
- J. P. Knauer, O. Barnouin, R. Keck, J. Delettrez, and S. Letzring, "Energy Partitioning of Spherically Irradiated Targets."
- D. R. Dykaar, R. Sobolweski, J. M. Chwalek, T. Y. Hsiang, and G. A. Mourou, "Electro-Optic Sampler for Characterization of Devices in Cryogenic Environment," presented at the Cryogenic Engineering Conference, St. Charles, IL, June 1987.
- W. Donaldson, G. Mourou, L. Kingsley, and C. Bamber, "Characterization of High-Voltage Photoconductive Switches," presented at the IEEE Pulsed Power Conference, Arlington, VA, 29 June-1 July 1987.

K. A. Cerqua, "Recent Advances in Materials Research for Solid State Laser Applications," presented for the Industrial Ceramics Delegation Tour of China, 21 June-12 July 1987.

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, General Electric Company, New York State Energy Research and Development Authority, Ontario Hydro, the University of Rochester, and the U.S. Department of Energy Office of Inertial Fusion under agreement No. DE-FC08-85DP40200.