

PUBLICATIONS AND CONFERENCE PRESENTATIONS

Publications

S. D. Jacobs, A. L. Hrycin, K. A. Cerqua, C. M. Kennemore III, and U. J. Gibson, "Adhesion Enhancements and Internal Stress in MgF₂ Films Deposited with Ion Beam Assistance," *Thin Solid Films* **144**, 69-76 (1986).

G. Pien, M. C. Richardson, P. D. Goldstone, R. H. Day, F. Ameduri, and G. Eden, "Computerized 3-GHz Multichannel Soft X-Ray Diode Spectrometer for High-Density Plasma Diagnosis," *Nucl. Instrum. Methods B* **18**, 101-110 (1986).

K. L. Marshall, "Laser-Damage-Resistant Polysiloxane Polymers as Homeotropic Alignment Layers for Liquid Crystal Devices," *Mol. Cryst. Liq. Cryst. Lett.* **3**, 133-138 (1986).

M. C. Richardson, B. Yaakobi, R. Epstein, J. S. Wark, and J. M. Soures, "Imploding Cylindrical Plasmas as X-Ray Laser Media," *High Intensity Laser Processes* (SPIE, Bellingham, WA, 1986), Vol. 664, pp. 270-276.

R. S. Marjoribanks, P. A. Jaanimagi, and M. C. Richardson, "Principles of Streak and Framing Photography by Frequency-Encoding on a Chirped Pulse," *High Speed Photography, Videography, and Photonics IV* (SPIE, Bellingham, WA, 1986), Vol. 693, pp. 134-146.

U. Feldman, J. F. Seely, C. M. Brown, J. O. Ekberg, M. C. Richardson, W. E. Behring, and J. Reader, "Spectra and Energy Levels of Br XXV, Br XXIX, Br XXX, and BR XXXI," *J. Opt. Soc. Am. B* **3**, 1605-1608 (1986).

W. E. Behring, C. M. Brown, U. Feldman, J. F. Seely, J. Reader, and M. C. Richardson, "Transitions of the Type $2s-2p$ in Oxygenlike Y, Zr, and Nb," *J. Opt. Soc. Am. B* **3**, 1113-1115 (1986).

P. A. Holstein, J. Delettrez, S. Skupsky, and J. P. Matte, "Modeling Nonlocal Heat Flow in Laser-Produced Plasmas," *J. Appl. Phys.* **60**, 2296-2300 (1986).

J. F. Seely, J. O. Ekberg, C. M. Brown, U. Feldman, W. E. Behring, J. Reader, and M. C. Richardson, "Laser-Produced Spectra and QED Effects for Fe-like, Cu-like, and Zn-like Ions of Au, Pb, Bi, Th, and U," *Phys. Rev. Lett.* **57**, 2924-2926 (1986).

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."

The following articles are to be published in *Laser Interaction and Related Plasma Phenomena Vol. 7*, edited by G. Miley and H. Hora (Plenum Press, New York, in press):

M. C. Richardson, P. W. McKenty, F. J. Marshall, C. P. Verdon, J. M. Soures, R. L. McCrory, O. Barnouin, R. S. Craxton, J. Delettrez, R. L. Hutchison, P. A. Jaanimagi, R. Keck, T. Kessler, H. Kim, S. A. Letzring, D. M. Roback, W. Seka, S. Skupsky, B. Yaakobi, and S. M. Lane, "Ablatively Driven Targets Imploded with the 24-UV-Beam OMEGA System."

M. C. Richardson, G. G. Gregory, R. L. Keck, S. A. Letzring, R. S. Marjoribanks, F. J. Marshall, G. Pien, J. S. Wark, B. Yaakobi, J. D. Goldstone, A. Hauer, G. S. Stradling, F. Ameduri, B. L. Henke, and P. A. Jaanimagi, "Time-Resolved X-Ray Diagnostics for High Density Plasma Physics Studies."

B. Yaakobi, O. Barnouin, C. B. Collins, R. Epstein, A. Hauer, S. A. Letzring, F. J. Marshall, R. L. McCrory, M. C. Richardson, J. M. Soures, and S. Wagel, "Laser-Generated X-Ray Studies Relevant to Compression Diagnostics and Nuclear Level Excitation."

W. C. Mead, S. V. Coggeshall, S. R. Goldman, E. K. Stover, P. D. Goldstone, A. Hauer, V. M. Kindel, L. Montierth, M. C. Richardson, O. Barnouin, P. A. Jaanimagi, R. S. Marjoribanks, R. L. Kauffman, H. Kornblum, and B. F. Lasinski, "Analysis, Modeling, and Design of Short Wavelength Laser Plasma Experiments."

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.).

M. Guardalben, A. Schmid, M. Loudiana, and J. T. Dickinson, "Photothermal Analysis of Synergistic Radiation Effects in ThF₄ Optical Thin Films," to be published in the *Journal of Applied Physics*.

P. Bado, M. Bouvier, and J. S. Coe, "Nd:YLF Mode-Locked Oscillator and Regenerative Amplifier," to be published in *Optics Letters*.

J. C. Lee and S. D. Jacobs, "Refractive Index and $\Delta n/\Delta T$ of Cr:Nd:GSGG at 1064 nm," to be published in *Applied Optics*.

R. R. Whitlock, S. P. Obenschain, J. Grun, J. A. Stamper, J. A. Sprague, B. V. Sweeney, B. H. Ripin, and R. S. Craxton, "Flash X Radiography of Laser-Accelerated Foils," to be published in the *Journal of Applied Physics*.

J. F. Whitaker, T. Norris, G. A. Mourou, and T. Y. Hsiang, "Pulse Dispersion and Shaping in Microstrip Lines," to be published in *IEEE Microwave Theory and Techniques Society Transactions*.

S. H. Batha and C. J. McKinstrie, "Energy Cascading in the Beat-Wave Accelerator," to be published in a special issue of *IEEE Transactions on Plasma Science on Plasma-Based High-Energy Accelerators*.

D. R. Dykaar, R. Sobolewski, T. Y. Hsiang, and G. A. Mourou, "Response of a Josephson Junction to a Stepped Voltage Pulse," to be published in *IEEE Transactions on Magnetics*.

J. M. Soures, R. L. McCrory, K. A. Cerqua, R. S. Craxton, R. Hutchison, S. D. Jacobs, T. J. Kessler, J. Kelly, G. Mourou, W. Seka, and D. Strickland, "High Power Laser Research and Development at the Laboratory for Laser Energetics," to be published in the *Proceedings of the SPIE's Fiber LASE Applications in Science and Engineering '86 Symposium*, Cambridge, MA, September 1986.

H. L. Helfer and R. L. McCrory, "Some Properties of a Polarized OCP," to be published in *Strongly Coupled Plasmas*, edited by Forest Rogers and Hugh DeWitt (Plenum Press, New York).

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

Conference Presentations

G. A. Mourou, "Femtosecond Optics for the Characterization of Terahertz Electronics," presented at the Electron Device Activities in Western New York Conference, Rochester, NY, October 1986.

The following presentations were made at the 1986 Optical Society of America Annual Meeting, Seattle, WA, October 1986:

S. D. Jacobs, D. G. Angeley, D. S. Smith, and J. C. Lampropoulos, "Thermal Conductivity Measurements of Dielectric Thin Films on Optical Substrates."

D. Strickland, P. Maine, and G. Mourou, "Generation of Ultrahigh Peak Power Pulses with the Technique of Chirped Pulse Amplification."

The following presentations were made at the 33rd National Symposium of the American Vacuum Society, Baltimore, MD, October 1986:

H. Kim and M. Wittman, "X-Ray Microscopy of Inertial Fusion Targets Using a Laser-Produced Plasma as an X-Ray Source."

S. Gracewski and R. Gram, "Analysis of Forces on ICF Targets During Ablation Layer Coating."

The following presentations were made at the Annual Fall Meetings, Glass, Basic Science, and Electronics Division, The American Ceramic Society, New Orleans, LA, November 1986:

K. A. Cerqua, S. D. Jacobs, and A. Lindquist, "Subsurface Damage Treatments for Ion-Exchange-Strengthened Phosphate Laser Glass."

S. D. Jacobs, R. S. Craxton, R. J. Hutchison, D. J. Smith, W. S. Beich, W. Seka, K. J. Skerit, T. J. Kessler, K. A. Cerqua, and K. L. Marshall, "Materials Issues for Efficient Frequency Tripling in High-Peak-Power Nd:Glass Lasers" (invited).

R. L. McCrory, J. M. Soures, P. Audebert, O. Barnouin, R. S. Craxton, J. Delettrez, R. Epstein, L. Forsley, R. Hutchison, R. Keck, T. Kessler, S. Jacobs, H. Kim, S. A. Letzring, R. Marjoribanks, F. Marshall, P. W. McKenty, G. A. Mourou, M. C. Richardson, W. Seka, R. W. Short, A. Simon, S. Skupsky, K. Swartz, C. Verdon, J. Wark, B. Yaakobi, and P. A. Jaanimagi, "Direct-Drive Laser Fusion in the U.S.," presented at the 11th International Conference on Plasma Physics and Controlled Nuclear Fusion Research, Kyoto, Japan, November 1986.

The following presentations were made at the APS Conference, Baltimore, MD, November 1986:

P. Audebert, O. Barnouin, J. Delettrez, R. Epstein, R. S. Marjoribanks, F. J. Marshall, M. C. Richardson, and B. Yaakobi, "Space-Resolved X-Ray Spectra of Imploding Laser Fusion Targets."

O. Barnouin, B. Yaakobi, and L. M. Goldman, "Origin of the Different Burn-Throughs Observed for Silicon and Calcium in Thermal Transport Experiments."

S. Batha, W. Seka, L. M. Goldman, A. Simon, R. W. Short, R. Bahr, and W. Lockman, "Enhanced Thomson Scattering from Laser Plasmas."

D. K. Bradley, A. Rankin, J. S. Wark, J. Lunney, J. Armstrong, R. W. Eason, A. Hauer, J. D. Kilkenny, A. Cullis, and U. Zammit, "Time-Resolved X-Ray Diffraction from Silicon During Pulsed Laser Annealing."

R. S. Craxton and R. L. McCrory, "Hydrodynamic Simulations of Nonuniformly Irradiated Targets."

J. Delettrez, R. Epstein, P. A. Jaanimagi, M. C. Richardson, and S. Skupsky, "Simulation of Recent Transport Experiments at LLE."

R. Epstein, J. Delettrez, S. Skupsky, and B. Yaakobi, "Non-LTE Radiation and Ion-Dynamic Effects in Hydrodynamic Simulations of Laser-Driven Plasmas."

G. G. Gregory, L. B. DaSilva, P. A. Jaanimagi, S. A. Letzring, P. W. McKenty, and M. C. Richardson, "Time-Resolved Photography of Spherical Targets Irradiated with 24 UV Beams."

P. A. Jaanimagi, J. Delettrez, O. Barnouin, L. DaSilva, R. Epstein, F. J. Marshall, M. C. Richardson, and B. Yaakobi, "Re-Interpretation of Thermal Transport Experiments on OMEGA."

R. S. Marjoribanks, P. Audebert, L. DaSilva, J. Delettrez, R. Epstein, G. Gregory, P. A. Jaanimagi, and M. C. Richardson, "Time-Resolved Temperature and Density Measurements in Ionizing, Uniformly Irradiated UV-Laser-Produced Plasmas."

F. J. Marshall, P. A. Jaanimagi, S. A. Letzring, R. L. McCrory, P. W. McKenty, M. C. Richardson, J. M. Soures, C. P. Verdon, and J. S. Wark, "Interpretation of Experimental Results of High-Aspect-Ratio Laser Fusion Target Implosions."

M. C. Richardson, P. Audebert, G. G. Gregory, P. A. Jaanimagi, R. J. Hutchison, R. Kremens, H. Kim, S. A. Letzring, F. J. Marshall, R. L. McCrory, P. W. McKenty, J. M. Soures, and C. P. Verdon, "Dynamics of Ablatively Driven Solid-Shell Targets on OMEGA."

W. Seka, R. Bahr, L. M. Goldman, F. J. Marshall, K. Swartz, R. W. Short, and A. Simon, "Investigation of the Spectral and Spatial Emission Characteristics Between Half and Twice the Laser Frequency of Uniformly Illuminated Spherical Laser Plasmas."

A. Simon, "Interpretation of Raman Spectral Observations."

C. P. Verdon, P. A. Jaanimagi, S. A. Letzring, F. J. Marshall, R. L. McCrory, P. W. McKenty, M. C. Richardson, J. M. Soures and J. S. Wark, "Theoretical Interpretation of OMEGA High-Yield and High-Density Implosion Experiments."

J. S. Wark, J. Delettrez, P. W. McKenty, M. C. Richardson, J. M. Soures, and C. P. Verdon, "Alpha Particle Imaging of High-Yield Implosions."

N. Delamater, A. Hauer, C. F. Hooper, T. Garber, M. Richardson, P. Jaanimagi, O. Barnouin, and R. L. Kauffman, "Spectroscopic Analysis of 0.35-Micron OMEGA Implosions of Kr/Ar-Filled Plastic Shells."

P. D. Goldstone, S. R. Goldman, W. C. Mead, J. A. Cobble, M. C. Richardson, F. J. Marshall, R. S. Marjoribanks, and P. A. Jaanimagi, "Dynamics of Short-Wavelength Laser-Produced High-Z Plasmas: An Update."

A. Hauer, N. Delamater, P. Audebert, O. Barnouin, G. Gregory, P. Jaanimagi, F. J. Marshall, M. C. Richardson, B. Yaakobi, and

D. Dustin, "Development of X-Ray Diagnostics for Ultraviolet Laser Implosions."

J. C. Moreno, H. R. Greim, S. Goldsmith, A. Krumbein, R. Epstein, M. Richardson, and B. Yaakobi, "Thermal Transport Studies of 351-nm Laser-Produced Plasmas Using EUV Spectroscopy."

S. Skupsky, "Coulomb Logarithms."

R. W. Short, "Stimulated Raman Scattering in Self-Focused Light Filaments in Laser-Produced Plasmas."

B. Yaakobi, "Recent Progress in X-Ray Laser Studies at the Laboratory for Laser Energetics," presented at the ISTO Ultra Short Wavelength Laser Technical Review, Washington, DC, December 1986.

H. E. Elsayed-Ali and G. A. Mourou, "Time-Resolved Phase Transitions in the Picosecond Time Domain," presented at the 1986 Fall Meeting of the Materials Research Society, Boston, MA, December 1986.

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