Publications and Conference Presentations

Publications

S. Augst and D. D. Meyerhofer, "Field Ionization of Noble Gas Atoms with a Keldysh Adiabaticity Parameter of One," Laser Phys. **4**, 1155 (1994).

R. Betti, V. Goncharov, R. L. McCrory, E. Turano, and C. P. Verdon, "Multiple Cutoff Wave Numbers of the Ablative Rayleigh-Taylor Instability," Phys. Rev. E. **50**, 3968 (1994).

X. D. Cao and D. D. Meyerhofer, "All-Optical Switching Via Collisions of Spatial Vector Solitons," Opt. Lett. **19**, 1711 (1994).

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X. D. Cao, D. D. Meyerhofer, and G. P. Agrawal, "Optimization of Optical Beam Steering in Nonlinear Kerr Media Via Spatial Phase Modulation," J. Opt. Soc. Am. B **11**, 2224 (1994).

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S. D. Jacobs, K. L. Marshall, and A. Schmid, "Liquid Crystals for Laser Applications," in CRC Handbook of Laser Science and Technology, Supplement 2: Optical Materials, edited by M. J. Weber (CRC Press, Boca Raton, FL, 1995), Sec. 14, pp. 509–577.

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Y. Lin and T. J. Kessler, "Raman Scattering in Air: Four-Dimensional Analysis," Appl. Opt. **33**, 4781 (1994).

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L. Mu, W. R. Donaldson, J. C. Adams, and R. A. Falk, "Electromagnetic Wave Interaction with Laser-Induced Plasmas in GaAs," in *Optically Activated Switching IV*, edited by W. R. Donaldson (SPIE, Bellingham, WA, 1994), Vol. 2343, pp. 107–112.

H. Shi and S.-H. Chen, "Novel Glassy Nematic and Chiral Nematic Oligomers Derived from 1,3,5-Cyclohexanetricarboxylic and (1R,3S)-(+)-Camphoric Acids," Liq. Cryst. **17**, 413 (1994).

M. D. Skeldon, A. Okishev, S. A. Letzring, W. R. Donaldson, K. Green, and W. Seka, "Optically Activated Switches for the Generation of Complex Electrical Waveforms with Multigigahertz Bandwidth," in *Optically Activated Switching IV*, edited by W. R. Donaldson (SPIE, Bellingham, WA, 1994), Vol. 2343, pp. 94–98.

B. Yaakobi, R. Epstein, F. J. Marshall, D. K. Bradley, P. A. Jaanimagi, and Q. Su, "New Diagnostic Features in the Laser Implosion of Argon-Filled Targets," Opt. Commun. **111**, 556 (1994).

Forthcoming Publications

M. S. Adams, M. V. Fedorov, V. P. Krainov, and D. D. Meyerhofer, "Comparison of Quasiclassical and Exact Dipole Moments for Bound-Free Transitions in Hydrogen," to be published in Physical Review A.

U. Alon, J. Hecht, D. Ofer, and D. Shvarts, "Power Laws and Similarity of Rayleigh-Taylor and Richtmyer-Meshkov Mixing Fronts at All Density Ratios," to be published in Physical Review Letters.

R. Betti and J. P. Freidberg, "Stability Analysis of Resistive Wall Kink Modes in Rotating Plasmas," to be published in Physical Review Letters.

T. R. Boehly, R. S. Craxton, T. H. Hinterman, J. H. Kelly, T. J. Kessler, S. A. Kumpan, S. A. Letzring, R. L. McCrory, S. F. B. Morse, W. Seka, S. Skupsky, J. M. Soures, and C. P. Verdon, "The Upgrade to the OMEGA Laser System," to be published in the Review of Scientific Instruments.

T. R. Boehly, R. S. Craxton, T. H. Hinterman, P. A. Jaanimagi, J. H. Kelly, T. J. Kessler, R. L. Kremens, S. A. Kumpan, S. A. Letzring, R. L. McCrory, S. F. B. Morse, W. Seka, S. Skupsky, J. M. Soures, and C. P. Verdon, "The Upgrade to the OMEGA Laser System," to be published in the Proceedings of the American Nuclear Society.

D. K. Bradley, P. M. Bell, O. L. Landen, J. D. Kilkenny, and J. Oertel, "Development and Characterization of a Pair of 30–40 ps X-Ray Framing Cameras," to be published in the Review of Scientific Instruments.

X. D. Cao and D. D. Meyerhofer, "Optimization of Pulse Shaping Using Nonlinear Polarization Rotation," to be published in Optical Communication.

X. D. Cao, L. Zheng, and D. D. Meyerhofer, "A Novel Method for the Measurement of Temporal Walk-Off of Short Pulses in Nonlinear Crystals," to be published in Optics Letters.

S. H. Chen and S. Krishnamurthy, "Some Fundamental Issues Governing Thermotropic Chiral Nematic Copolymers," to be published in the Proceedings of the 42nd Society for Polymer Science, Kyoto, Japan, 31 May–2 June 1993.

C. Y. Chien, G. Korn, J. S. Coe, J. Squier, G. Mourou, and R. S. Craxton, "Highly Efficient Second-Harmonic Generation of Ultra-Intense Nd:Glass Laser Pulses," to be published in Optics Letters.

C. T. Cotton, "The Design of an All-Spherical, Three-Mirror, Off-Axis Telescope Objective," to be published in the OSA Proceedings of the International Optical Design Conference '94.

M. J. Cumbo, D. Fairhurst, S. D. Jacobs, and B. E. Puchebner, "Slurry Particle Size Evolution during the Polishing of Optical Glass," to be published in Applied Optics.

D. Fried, R. E. Glena, J. D. B. Featherstone, and W. Seka, "The Nature of Light Scattering in Dental Enamel and Dentin at Visible and Near Infrared Wavelengths," to be published in Applied Optics.

R. E. Giacone, C. J. McKinstrie, and R. Betti, "Angular Dependence of Stimulated Brillouin Scattering in Homogeneous Plasma," to be published in Physics of Plasmas.

D. Gupta, W. R. Donaldson, and A. M. Kadin, "Rapid Flux Motion and Critical State Dynamics in a Superconducting Disk," to be published in the Journal of Applied Physics.

D. A. Haynes, C. F. Hooper, R. C. Mancini, D. K. Bradley, J. Delettrez, R. Epstein, and P. A. Jaanimagi, "Spectroscopic Analysis of Ar-Doped Laser Driven Implosions," to be published in the Review of Scientific Instruments.

J. Hecht, D. Ofer, U. Alon, D. Shvarts, S. A. Orszag, and R. L. McCrory, "Three-Dimensional Simulations and Analysis of the Nonlinear Stage of the Rayleigh-Taylor Instability," to be

published in Laser and Particle Beams.

P. A. Jaanimagi, R. C. Elton, B. L. Welch, Y. Leng, and H. R. Griem, "Extending X-Ray Streak Camera Operation to VUV Wavelengths," to be published in the Review of Scientific Instruments.

J. P. Knauer, R. L. Kremens, M. A. Russotto, and S. Tudman, "Using Cosmic Rays to Monitor Large Scintillator Arrays," to be published in the Review of Scientific Instruments.

E. M. Korenic, K. L. Marshall, and J. A. Maiolo, "Blending Polysiloxane 'Glass Resins' to Produce Optical Films with a Specific Refractive Index," to be published in Optics and Photonics News.

Y. Kostoulas, L. J. Waxer, I. A. Walmsley, G. W. Wicks, and P. M. Fauchet, "Femtosecond Carrier Dynamics in Low-Temperature-Grown Indium Phosphide," to be published in Applied Physics Letters.

W. Lang, W. Gob, W. Kula, and R. Sobolewski, "Anisotropic Magnetoresistance in the Normal State of Oxygen-Deficient $YBa_2Cu_3O_{7-x}$ Thin Films Induced by Superconducting Fluctuations," to be published in Physica B.

W. Lang, G. Heine, W. Kula, and R. Sobolewski, "Study of Superconducting Fluctuations in $Bi_2Sr_2Ca_2Cu_3O_x$ Thin Films: Paraconductivity, Excess Hall Effect, and Magneto-conductivity," to be published in Zeitschrift Fur Physik B.

Y. Lin, T. J. Kessler, and G. Lawrence, "Distributed Phase Plates for Supergaussian Focal-Plane Irradiance Profiles," to be published in Optics Letters.

F. J. Marshall and B. Yaakobi, "Quantitative Measurements with X-Ray Microscopes in Laser-Fusion Experiments," to be published in the Review of Scientific Instruments.

K. L. Marshall, S. D. Jacobs, and J. E. Miller, "Mid-Infrared Modulation Using Field-Induced Scattering in Ferroelectric Liquid Crystals," to be published in Applied Optics.

J. C. Mastrangelo, T. N. Blanton, and S.-H. Chen, "Crystallization upon Thermal Annealing of a Glass-Forming Liquid Crystal in the Nematic Regime," to be published in Applied Physics Letters.

R. L. McCrory, "Progress Toward Ignition with Direct Drive," to be published in Concerning Major Systems in Science and Technology.

R. L. McCrory, J. M. Soures, C. P. Verdon, T. R. Boehly, D. K. Bradley, R. S. Craxton, J. A. Delettrez, R. Epstein, P. A. Jaanimagi, S. D. Jacobs, R. L. Keck, J. H. Kelly, T. J. Kessler, H. Kim, J. P. Knauer, R. L. Kremens, S. A. Kumpan, S. A. Letzring, F. J. Marshall, P. J. McKenty, S. F. B. Morse, A. Okishev, W. Seka, R. W. Short, M. D. Skeldon, S. Skupsky, M. Tracy, and B. Yaakobi, "Direct-Drive Laser Fusion Experimental Program at the University of Rochester Laboratory for Laser Energetics," to be published in the Proceedings of the Conference on Plasma Physics and Controlled Nuclear Fusion Research.

C. J. McKinstrie, R. Betti, R. E. Giacone, T. Kolber, and E. J. Turano, "Two-Dimensional Stimulated Scattering of Short Laser Pulses," to be published in Physical Review E.

J. Peatross and D. D. Meyerhofer, "Intensity-Dependent Atomic Phase Effects in High-Order Harmonic Generation," to be published in Physical Review A.

J. Z. Roach, A. Ninkov, S. W. Swales, and T. Morris, "Design and Evaluation of a Screen CCD Imaging System," to be published in Optical Engineering.

W. Seka, D. Fried, J. D. B. Featherstone, and S. F. Borzillary, "Light Deposition and Thermal Response in Dental Hard Tissue," to be published in the Journal of Dental Research.

H. Shi and S.-H. Chen, "Novel Glass-Forming Liquid Crystals. 2. Systems Containing High Optical Birefringence Moiety 1-(Phenyl)-2-(6-Cyanonaphth-2-yl)Ethyne," to be published in Liquid Crystals.

H. Shi and S.-H. Chen, "Effects of Stereochemistry, Mesogenic Core, and Space Length on Crystallization from Nematic and Isotropic Melts of Cyclohexane-Based, Glass-Forming Liquid Crystals," to be published in Liquid Crystals.

D. Shvarts, U. Alon, D. Ofer, R. L. McCrory, and C. P. Verdon, "Nonlinear Evolution of Multimode Rayleigh-Taylor Instability in Two and Three Dimensions," to be published in Physics of Plasmas.

M. D. Skeldon, "Transverse Modulational Instabilities in the Presence of Stimulated Rotational Raman Scattering with a High-Energy Laser," to be published in Optics Letters.

R. Sobolewski and T. Y. Hsiang, "Progress in Ultrafast Superconducting Electronics," to be published in the Proceedings of the International Workshop on Superconductivity and Particle Detection. (invited)

C. J. Twomey, T. N. Blanton, K. L. Marshall, S. H. Chen, and S. D. Jacobs, "Some Dynamic Features of the Preparation of Liquid Crystalline Elastomers," to be published in Liquid Crystals.

C. P. Verdon and R. L. McCrory, "Direct-Drive Capsule Physics," to be published in the Proceedings of ECLIM '94.

C.-C. Wang, M. Currie, R. Sobolewski, and T. Y. Hsiang, "Subpicosecond Electrical Pulse Generation by Edge Illumination of Silicon and Indium Phosphide Photoconductive Switches," to be published in Applied Physics Letters.

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M. D. Wittman, R. Q. Gram, H. Kim, C. K. Immesoete, S. G. Noyes, and S. Scarantino, "Increased Retention Time for Hydrogen and Other Gases by Polymer Shells Using Optically Transparent Aluminum Layers," to be published in the Journal of Vacuum Science and Technology.

B. Yaakobi, Q. Su, F. J. Marshall, and R. Epstein, "Monochromatic Backlighting as a Laser-Fusion Diagnostic," to be published in the Journal of X-Ray Science and Technology.

B. Yaakobi, D. Shvarts, F. J. Marshall, R. Epstein, and Q. Su, "Target Imaging and Backlighting Diagnosis," to be published in the Review of Scientific Instruments.

B. Yaakobi, R. Epstein, F. J. Marshall, D. K. Bradley, P. A. Jaanimagi, and Q. Su, "New Diagnostic Features in the Laser Implosion of Argon-Filled Targets," to be published in the Review of Scientific Instruments.

B. Yaakobi, D. Shvarts, R. Epstein, and Q. Qu, "X-Ray Backlighting Imaging of Mixed Imploded Targets," to be published in the Journal of Applied Physics.

M. Yu, C. J. McKinstrie, and G. P. Agrawal, "Modulational Instabilities in Dispersion-Flattened Fibers," to be published in Physical Review E.

L. Zheng and D. D. Meyerhofer, "A Linear Cross-Correlation Technique for Single-Shot Measurements of Weak Light Pulses," to be published in Optics Letters.

X. Zhou, S. Alexandrou, and T. Y. Hsiang, "Monte Carlo Investigation of the Mechanism of Subpicosecond Pulse Generation by Nonuniform Gap Illumination," to be published in Applied Physics Letters.

J. D. Zuegel and W. Seka, "Direct Measurements of Lower-Level Lifetime in Nd:YLF," to be published in the Bulletin of the American Physical Society.

Conference Presentations

The following presentations were made at the OSA Annual Meeting/ILS-X '94, Dallas, TX, 2–7 October 1994:

W. I. Kordonsky and S. D. Jacobs, "Optical Finishing with Magnetorheological Fluids."

D. D. Meyerhofer, C. Bamber, T. Blalock, S. Boege, T. Kotseroglou, and A. C. Melissinos, "1-Hz, 1-ps, Terawatt, Chirped Pulse Amplification Laser System with a Nd:Glass Slab Amplifier."

C. I. Moore, J. P. Knauer, and D. D. Meyerhofer, "Relativistic Ponderomotive Acceleration of Electrons from a Laser Focus."

J. D. Zuegel and W. Seka, "Direct Measurements of Lower-Level Lifetime in Nd:YLF."

S. H. Chen, "Novel Low Molar Mass Glass-Forming Liquid Crystals: Synthesis, Characterization, and Morphological

Stability," 43rd Symposium on Macromolecules, Fukuoka, Japan, 12 October 1994.

The following presentations were made at the 1994 Applied Superconductivity Conference, Boston, MA, 16–21 October 1994:

M. Currie, C.-C. Wang, D. Jacobs-Perkins, R. Sobolewski, and T. Y. Hsiang, "An Optoelectronic Testing System of Rapid, Single-Flux Quantum Circuits."

D. Gupta, W. R. Donaldson, and A. M. Kadin, "Transient Flux Dynamics in Optically Irradiated YBCO Thin Film Switches."

W. Kula, W. Xiong, R. Sobolewski, and J. Talvacchio, "Laser Patterning of $YBa_2Cu_3O_x$ Thin Films Protected by *in-situ* Grown $SrTiO_3$ Cap Layer."

C.-C. Wang, M. Currie, and T. Y. Hsiang, "Ultrafast, Integrable, Optics-Based Interface between Superconducting and Room-Temperature Electronics."

C.-C. Wang, M. Currie, D. Jacobs-Perkins, L. Shi, and T. Y. Hsiang, "Picosecond Cryogenic Nb/Si/Nb Metal-Semiconductor-Metal (MSM) Photodiode on Superconducting Microstrip Transmission Lines."

W. Xiong, M. Currie, W. Kula, and R. Sobolewski, "Thin-Film YBCO Photodetectors Based on Oxygen-Depleted Structures."

The following presentations were made at the XXVI Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 24–26 October 1994:

S. S. Papernov and A. W. Schmid, "A Comparison of Laser-Induced Damage Micromorphology in Three Model Thin-Film Systems: HfO_2, Y_2O_3, and Ta_2O_5."

D. J. Smith, J. F. Anzellotti, A. W. Schmid, S. Papernov, Z. R. Chrzan, and S. J. Van Kerkhove, "Damage Fluence at 1054 nm and 351 nm of Coatings Made with Hafnium Oxide Evaporated from Metallic Hafnium."

M. D. Wittman, H. Kim, and A. S. Chow, "Determination of the Wall Thickness and Uniformity of Inertial-Fusion Capsules Using the Self-Interference Fringes Produced with Narrow-Bandwidth Illumination," 41st National Symposium of the American Vacuum Society, Denver, CO, 24–28 October 1994.

The following presentations were made at LEOS '94 7th Annual Meeting, Boston, MA, 31 October–3 November 1994:

W. R. Donaldson, L. Mu, D. Jacobs-Perkins, and T. Y. Hsiang, "Two-Dimensional Electro-Optic Sampling in GaAs Photoconductive Switches."

Y. Kostoulas, K. B. Ucer, L. Waxer, G. W. Wicks, I. A. Walmsley, and P. M. Fauchet, "Ultrafast Carrier Lifetime in Low-Temperature-Grown GaAs, InP, and InGaP."

The following presentations were made at SPIE's International Symposium on Photonic Sensors & Controls for Commercial Applications, Boston, MA, 31 October–4 November 1994:

D. Gupta, W. R. Donaldson, and A. M. Kadin, "Energy Extraction from Superconducting Magnets Using Optically Activated $YBa_2Cu_3O_{7-x}$ Switches."

L. Mu, W. R. Donaldson, J. C. Adams, and R. A. Falk, "Electromagnetic Wave Interaction with Laser-Induced Plasmas in GaAs."

M. D. Skeldon, A. Okishev, S. A. Letzring, W. R. Donaldson, K. Green, and W. Seka, "Optically Activated Switches for the Generation of Complex Electrical Waveforms with Multigigahertz Bandwidth."

The following presentations were made at the 36th Annual Meeting, APS Division of Plasma Physics, Minneapolis, MN, 7–11 November 1994:

R. Betti, H. L. Berk, and J. P. Freidberg, "Theory of the Beta-Induced Alfven Eigenmode."

R. Betti and J. P. Freidberg, "The Effect of Plasma Rotation on the Resistive Wall Mode."

T. R. Boehly, R. S. Craxton, P. A. Jaanimagi, J. H. Kelly, T. J. Kessler, R. L. Kremens, S. A. Kumpan, S. A. Letzring, R. L.

McCrory, S. F. B. Morse, W. Seka, S. Skupsky, J. M. Soures, M. D. Tracy, and C. P. Verdon, "Initial Performance Results from the Upgraded OMEGA Laser."

A. V. Chirokikh, W. Seka, R. E. Bahr, R. S. Craxton, R. W. Short, A. Simon, and M. D. Skeldon, "Observations and Simulation of Stimulated Brillouin Scattering in Long-Scale-Length Laser Plasmas."

R. S. Craxton, M. Dunne, and O. Willi, "Competition between Target Self-Emission and Soft X-Ray Backlighting."

S. Cremer, J. P. Knauer, R. L. Kremens, M. A. Russotto, D. Shvarts, S. Skupsky, and C. P. Verdon, "Relation of Primary- to Secondary-Reaction Products to the Final Core Parameters of Pure Deuterium Targets in Laser Fusion Experiments."

J. A. Delettrez, D. K. Bradley, and C. P. Verdon, "A Mix Model in *LILAC* for the Linear and Weakly Nonlinear Regimes of the Rayleigh-Taylor Instability."

E. M. Epperlein and R. W. Short, "Nonlocal Electron Transport in the Presence of High-Intensity Laser Irradiation."

R. Epstein, J. A. Delettrez, C. P. Verdon, D. Shvarts, and B. Yaakobi, "Simulations of Spectral Signatures and Images of Core-Shell Mixing in Laser-Driven Implosions."

R. E. Giacone, C. J. McKinstrie, T. Kolber, and R. Betti, "Two-Dimensional Stimulated Brillouin Scattering."

V. Goncharov, R. Betti, R. L. McCrory, and C. P. Verdon, "The Effect of Thermal Conduction on the Ablative Rayleigh-Taylor Instability."

J. P. Knauer, P. W. McKenty, C. P. Verdon, S. G. Glendinning, S. V. Weber, D. M. Pennington, and R. J. Wallace, "Growth of Low-Amplitude Mass Perturbations due to the Rayleigh-Taylor Instability."

T. Kolber, C. J. McKinstrie, R. Betti, and R. E. Giacone, "The Effects of Realistic Geometry on Two-Dimensional Stimulated Brillouin Scattering."

R. L. Kremens, M. A. Russotto, and S. Tudman, "Simulation of 'Saturated' Operation of the MEDUSA Neutron Detector Array."

J. S. Li, C. J. McKinstrie, C. Joshi, and K. Marsh, "Thermal Filamentation of Counterpropagating Laser Beams."

F. J. Marshall, A. Hauer, J. Oertel, and R. Watt, "Monochromatic X-Ray Imaging of Laser-Fusion Targets."

C. J. McKinstrie, R. Betti, R. E. Giacone, and T. Kolber, "Stimulated Raman Scattering of Short Pulse Lasers."

W. Seka, A. V. Chirokikh, R. S. Craxton, R. E. Bahr, C. Labaune, H. A. Baldis, N. Renard, E. Schifano, A. Michard, S. Baton, B. Bauer, K. Baker, R. P. Drake, and K. Estabrook, "Stimulated Brillouin Scattering in Long-Scale-Length, Preformed Plasmas at 1 mm: Experiments and Simulations."

R. W. Short, "Smoothing of Speckle Irradiation Patterns by Temporal Evolution of the Target Corona."

D. Shvarts, U. Alon, D. Ofer, J. Hecht, R. L. McCrory, and C. P. Verdon, "Nonlinear Evolution of Multi-Mode Rayleigh-Taylor and Richtmyer-Meshkov Instabilities in Two and Three Dimensions."

A. Simon and R. W. Short, "Parametric Instability of Bernstein and Fluid Modes in Laser-Produced Plasma."

E. J. Turano, C. J. McKinstrie, and W. L. Kruer, "Relativistic Saturation of Forward Stimulated Raman Scattering."

T. R. Boehly, R. S. Craxton, T. H. Hinterman, P. A. Jaanimagi, R. L. Keck, J. H. Kelly, T. J. Kessler, R. L. Kremens, S. A. Kumpan, S. A. Letzring, R. L. McCrory, S. F. B. Morse, W. Seka, S. Skupsky, J. M. Soures, and C. P. Verdon, "The Upgrade to the OMEGA Laser System," IAEA, Paris, France, 14–18 November 1994.

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