
Publications and Conference Presentations

Publications

- E. L. Alfonso, S.-H. Chen, M. D. Wittman, S. Papernov, and D. Harding, "A Parametric Study of Microencapsulation Approach to the Preparation of Polystyrene Shells," *Polymer* **38**, 1639 (1997).
- T. R. Boehly, D. L. Brown, R. S. Craxton, R. L. Keck, J. P. Knauer, J. H. Kelly, T. J. Kessler, S. A. Kumpan, S. J. Loucks, S. A. Letzring, F. J. Marshall, R. L. McCrory, S. F. B. Morse, W. Seka, J. M. Soures, and C. P. Verdon, "Initial Performance Results of the OMEGA Laser System," *Opt. Commun.* **133**, 495 (1997).
- S.-H. Chen, J. C. Mastrangelo, H. Shi, T. N. Blanton, and A. Bashir-Hashemi, "Novel Glass-Forming Organic Materials. 3. Cubane with Pendant Nematogens, Carbazole, and Disperse Red 1," *Macromol.* **30**, 93 (1997).
- S.-H. Chen, H. Shi, J. C. Mastrangelo, and J. J. Ou, "Thermotropic Chiral Nematic Side-Chain Polymers and Cyclic Oligomers," *Prog. Polym. Sci.* **21**, 1211 (1996).
- J. H. Kelly, T. R. Boehly, J. M. Soures, D. L. Brown, R. Boni, R. S. Craxton, R. L. Keck, T. J. Kessler, R. L. Kremens, S. A. Kumpan, S. A. Letzring, S. J. Loucks, R. L. McCrory, S. F. B. Morse, W. Seka, S. Skupsky, and C. P. Verdon, "The Activation of the Upgraded OMEGA Laser at the University of Rochester," in the *8th Laser Optics Conference Technical Digest* (SPIE, Bellingham, WA, 1996), Vol. II, pp. 121–122.
- A. K. Lal, K. A. Marsh, C. E. Clayton, C. Joshi, C. J. McKinstrie, J. S. Li, and T. W. Johnston, "Transient Filamentation of a Laser Beam in a Thermal Force Dominated Plasma," *Phys. Rev. Lett.* **78**, 670 (1997).
- F. J. Marshall and J. A. Oertel, "A Framed Monochromatic X-Ray Microscope for ICF," *Rev. Sci. Instrum.* **68**, 735 (1997).
- J. C. Mastrangelo, B. M. Conger, and S.-H. Chen, "Novel Glass-Forming Organic Materials. 2. Structure and Fluorescence of Pyrene- and Carbazole-Containing Cyclohexane, Bicyclooctene, and Adamantane," *Chem. Mater.* **9**, 227 (1997).
- C. J. McKinstrie, V. A. Smalyuk, R. E. Giacone, and H. X. Vu, "Power Transfer between Crossed Laser Beams and the Associated Frequency Cascade," *Phys. Rev. E* **55**, 2044 (1997).
- S. J. McNaught, J. P. Knauer, and D. D. Meyerhofer, "Measurement of the Initial Condition of Electrons Ionized by a Linearly Polarized, High-Intensity Laser," *Phys. Rev. Lett.* **78**, 626 (1997).
- A. V. Okishev and W. Seka, "Diode-Pumped, Single-Frequency Nd:YLF Laser for 60-Beam OMEGA Laser Pulse-Shaping System," in *Solid State Lasers VI*, edited by R. Scheps (SPIE, Bellingham, WA, 1997), Vol. 2986, pp. 93–98.
- J. Z. Roach and S. W. Swales, "A Network-Based Imaging System for the OMEGA Laser System," in the *Proceedings of the International Society for Optical Engineering* (SPIE, Bellingham, WA, 1997), Vol. 2874, pp. 145–152.
- B. Yaakobi, F. J. Marshall, and J. A. Delettrez, "Abel Inversion of Cryogenic Laser Target Images," *Opt. Commun.* **133**, 43 (1997).

Forthcoming Publications

S. Alexandrou, C.-C. Wang, M. Currie, R. Sobolewski, and T. Y. Hsiang, "Characterization of Coplanar Transmission Lines at Subterahertz Frequencies," to be published in *IEEE Transactions on Microwave Theory and Techniques*.

J. F. Anzellotti, D. J. Smith, R. J. Sczupak, and Z. R. Chrzan, "Stress and Environmental Shift Characteristics of $\text{HfO}_2/\text{SiO}_2$ Multilayer Coatings," to be published in the Proceedings of the XXVII Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 7–9 October 1996.

A. Babushkin, W. Seka, S. A. Letzring, W. Bittle, M. Labuzeta, M. Miller, and R. G. Roides, "Multicolor Fiducial Laser for Streak Cameras and Optical Diagnostics for the OMEGA Laser System," to be published in the Proceedings of the 22nd International Congress on High-Speed Photography and Photonics, Santa Fe, NM, 27 October–1 November 1996.

R. Betti, V. N. Goncharov, R. L. McCrory, and C. P. Verdon, "Linear Theory of the Ablative Rayleigh-Taylor Instability," to be published in the Proceedings of the 24th ECLIM, Madrid, Spain, 3–7 June 1996.

T. R. Boehly, R. L. Keck, C. Kellogg, J. H. Kelly, T. J. Kessler, J. P. Knauer, Y. Lin, D. D. Meyerhofer, W. Seka, S. Skupsky, V. A. Smalyuk, S. F. B. Morse, and J. M. Soures, "Demonstration of Three Enhancements to the Uniformity of OMEGA: 2-D SSD, New DPP's, and DPR's," to be published in the Proceedings of the Second Annual International Conference on Solid-State Lasers for Application to Inertial Confinement Fusion (ICF), Paris, France, 22–25 October 1996.

D. K. Bradley and P. M. Bell, "Implementation of 30-ps Temporal Resolution Imaging on the OMEGA Laser System," to be published in the Proceedings of the 22nd International Congress on High-Speed Photography and Photonics, Santa Fe, NM, 27 October–1 November 1996.

J. L. Chaloupka, T. J. Kessler, and D. D. Meyerhofer, "A Single-Beam, Ponderomotive-Optical Trap for Free Electrons and Neutral Atoms," to be published in *Optics Letters*.

A. V. Chirikikh, W. Seka, A. Simon, and R. S. Craxton, "Brillouin Scattering in Long-Scale-Length Laser Plasmas," to be published in *Physics of Plasmas*.

B. M. Conger, J. C. Mastrangelo, and S.-H. Chen, "Fluorescence Behavior of Low Molar Mass and Polymer Liquid Crystals in Solution and Ordered Solid Film," to be published in *Macromolecules*.

B. DeMarco, C. W. Barnes, K. Kearney, and R. L. Kremens, "Neutron Yield Measurement on the OMEGA Laser System," to be published in the *Review of Scientific Instruments*.

R. Epstein, "Properties of the Speckle of Focused, Phase-Converted Laser Beams and the Reduction of Time-Averaged Irradiation Nonuniformity in Laser-Driven Plasmas due to Target Ablation," to be published in the *Journal of Applied Physics*.

P. M. Fauchet, "Photoluminescence and Electroluminescence from Porous Silicon," to be published in the *Journal of Photoluminescence* (invited).

P. M. Fauchet, "Porous Silicon: Photoluminescence and Electroluminescent Devices," to be published in the *Light Emission in Silicon, Semiconductors, and Semimetals Series*.

P. M. Fauchet, Ju. V. Vandyshev, Z. Xu, C. W. Rella, H. A. Schwettman, and G. W. Wicks, "Mid-Infrared Femtosecond Spectroscopy of Intersubband Hot-Hole Relaxation in Quantum Wells," to be published in the Proceedings of OSA's Tenth International Topical Meeting on Ultrafast Phenomena, San Diego, CA, 28 May–1 June 1996.

D. Fried, R. E. Glena, J. D. B. Featherstone, and W. Seka, "Permanent and Transient Changes in the Reflectance of CO_2 Laser-Irradiated Dental Hard Tissues at $\lambda = 9.3, 9.6, 10.3,$ and $10.6 \mu\text{m}$ and at Fluences between $1\text{--}20 \text{ J/cm}^2$," to be published in *Lasers in Surgery and Medicine*.

B. E. Gillman, Y. Zhou, and S. D. Jacobs, "Coolant/Tool Interactions in Deterministic Microgrinding of Glass," to be published in *Superabrasives Technology 1996*, Livermore, CA, 7–8 November 1996.

V. N. Goncharov and R. Betti, "Growth Rate of the Ablative Rayleigh-Taylor Instability for Indirect-Drive ICF," to be published in *Physics of Plasmas*.

M. J. Guardalben, "Canoscopic Alignment Methods for Birefringent Optical Elements in Fusion Lasers," to be published in *Optics & Photonics News*.

O. E. Hanuch, V. B. Agrawal, S. Papernov, M. delCerro, and J. V. Aquavella, "Posterior Capsular Polishing with the Nd:YLF Picosecond Laser: Model Eye Study," to be published in *Investigative Ophthalmology*.

D. Jacobs-Perkins, M. Currie, C.-C. Wang, C. Williams, W. R. Donaldson, R. Sobolewski, and T. Y. Hsiang, "Subpicosecond Imaging System Based on Electro-Optic Effect," to be published in the *IEEE Journal on Selected Topics in Quantum Electronics*.

J. H. Kelly, T. R. Boehly, J. M. Soures, D. L. Brown, R. Boni, R. S. Craxton, R. L. Keck, T. J. Kessler, R. L. Kremens, S. A. Kumpan, S. A. Letzring, S. J. Loucks, R. L. McCrory, S. F. B. Morse, W. Seka, S. Skupsky, and C. P. Verdon, "The Activation of the Upgraded OMEGA Laser at the University of Rochester," to be published in the *SPIE Proceedings of the 1st Annual International Conference on Solid-State Lasers for Application to Inertial Confinement Fusion (ICF)*, Monterey, CA, 30 May–2 June 1995.

T. J. Kessler, Y. Lin, L. S. Iwan, W. P. Castle, C. Kellogg, J. Barone, E. Kowaluk, A. W. Schmid, K. L. Marshall, D. J. Smith, A. L. Rigatti, J. Warner, and A. R. Staley, "Laser Phase Conversion Using Continuous Distributed Phase Plates," to be published in the *Proceedings of the Second Annual International Conference on Solid-State Lasers for Application to Inertial Confinement Fusion (ICF)*, Paris, France, 22–25 October 1996.

E. M. Korenic, S. D. Jacobs, S. M. Faris, and L. Li, "Colorimetry of Cholesteric Liquid Crystals," to be published in the *Proceedings of Optics and Imaging in the Information Age*, Rochester, NY, 20–25 October 1996.

K. S. Lebedev, E. A. Magulariya, S. G. Lukishova, S. V. Belyaev, N. V. Malimonenko, and A. W. Schmid, "Reflective Nonlinearities of Nonabsorbing Chiral Liquid Crystals: Frustration of Selective Reflection by Powerful Laser Radiation," to be published in the *Bulletin of the American Physical Society*.

M. Lindgren, M. Currie, C. Williams, T. Y. Hsiang, P. M. Fauchet, R. Sobolewski, S. H. Moffat, R. A. Hughes, J. S. Preston, and F. A. Hegmann, "Intrinsic Photoresponse of a Y-Ba-Cu-O Superconductor," to be published in *Physical Review Letters*.

M. Lindgren, M. Currie, C. Williams, T. Y. Hsiang, P. M. Fauchet, R. Sobolewski, S. H. Moffat, R. A. Hughes, J. S. Preston, and F. A. Hegmann, "Ultrafast Photoresponse in Microbridges and Pulse Propagation in Transmission Lines Made from High- T_c Superconducting Y-Ba-Cu-O Thin Films," to be published in the *IEEE Journal of Selected Topics in Quantum Electronics*.

S. G. Lukishova, S. V. Belyaev, K. S. Lebedev, E. A. Magulariya, A. W. Schmid, and N. V. Malimonenko, "cw and High-Repetition-Rate Lasing in Nd:YAG Resonators with Chiral-Nematic Liquid-Crystal Mirrors: A Study of Nonlinear Responses," to be published in *Quantum Electronics*.

S. G. Lukishova, S. V. Belyaev, K. S. Lebedev, E. A. Magulariya, A. W. Schmid, and N. V. Malimonenko, "Nonlinear Bleaching in the Selective Reflection of Nonabsorbing Chiral-Nematic Liquid-Crystal Thin Films," to be published in *JETP Letters* and in *Molecular Crystals and Liquid Crystals*.

S. M. McCormack, D. Fried, J. D. B. Featherstone, R. E. Glenna, and W. Seka, "Scanning Electron Microscope Observations of CO₂ Laser Effects on Dental Enamel," to be published in the *Journal of Dental Research*.

R. L. McCrory, "The LLE Direct-Drive Target Physics Experimental Program: First Year of ICF Experiments on OMEGA," to be published in the *Proceedings of the 24th ECLIM*, Madrid, Spain, 3–7 June 1996 (invited).

A. V. Okishev and W. Seka, "Diode-Pumped Nd:YLF Master Oscillator for the 30-kJ (UV), 60-Beam OMEGA Laser Facility," to be published in the *IEEE Journal of Selected Topics in Quantum Electronics*.

J. J. Ou and S.-H. Chen, "Molecular Dynamics Simulation of Organic Glass-Formers. I. *ortho*-Terphenyl and 1.3.5-Tri- α -Naphthyl Benzene," to be published in *Journal of Computational Chemistry*.

S. Papernov and A. W. Schmid, "Heat Transfer from Localized Absorbing Defects to the Host Coating Material in $\text{HfO}_2/\text{SiO}_2$ Multilayer Systems," to be published in the Proceedings of the XXVIII Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 7–9 October 1996.

R. D. Petrasso, C. K. Li, M. D. Cable, S. M. Pollaine, S. W. Haan, T. P. Bernat, J. D. Kilkenny, S. Cremer, J. P. Knauer, C. P. Verdon, and R. L. Kremens, "Implosion Symmetry and ρR Measurements of the National Ignition Facility from Nascent 31-MeV Tertiary Protons," to be published in Physical Review Letters.

A. L. Rigatti and D. J. Smith, "Status of Optics on the OMEGA Laser System after 18 Months of Operation," to be published in the Proceedings of the XXVIII Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 7–9 October 1996.

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.

A. W. Schmid, T. J. Kessler, S. Papernov, and J. Barone, "Low-Surface-Energy Photoresist as a Medium for Optical Replication," to be published in Applied Physics Letters.

W. Seka, J. H. Kelly, S. F. B. Morse, J. M. Soures, M. D. Skeldon, A. Okishev, A. Babushkin, R. L. Keck, and R. G. Roides, "OMEGA Laser Performance with Pulse Shaping," to be published in the Proceedings of the Second Annual International Conference on Solid-State Lasers for Application to Inertial Confinement Fusion (ICF), Paris, France, 22–25 October 1996.

H. Shi, B. M. Conger, D. Katsis, and S.-H. Chen, "Circularly Polarized Fluorescence from Chiral Nematic Liquid Crystalline Films: Theory and Experiment," to be published in Liquid Crystals.

M. J. Shoup III, J. H. Kelly, and D. L. Smith, "Design and Testing of a Large-Aperture, High-Gain, Brewster's-Angle Zigzag Nd:Glass Slab Amplifier," to be published in Applied Optics.

A. Simon, "Comparison Between SBS Theories and Experiment," to be published in the Proceedings of the LaJolla Summer School '95, Plasma Physics and Technology (AIP).

M. D. Skeldon, A. Babushkin, J. D. Zuegel, R. L. Keck, A. Okishev, and W. Seka, "Modeling of an Actively Stabilized Regenerative Amplifier for OMEGA Pulse-Shaping Applications," to be published in the Proceedings of the Second Annual International Conference on Solid-State Lasers for Application to ICF, Paris, France, 22–25 October 1996.

M. D. Skeldon, A. Babushkin, W. Bittle, A. V. Okishev, and W. Seka, "Modeling the Temporal-Pulse-Shape Dynamics of an Actively Stabilized Regenerative Amplifier for OMEGA Pulse-Shaping Applications," to be published in the IEEE Journal of Quantum Electronics.

D. J. Smith, J. F. Anzellotti, S. Papernov, and Z. R. Chrzan, "High Laser-Induced-Damage Threshold Polarizer Coatings for 1054 nm," to be published in the Proceedings of the XXVIII Annual Symposium on Optical Materials for High Power Lasers, Boulder, CO, 7–9 October 1996.

J. M. Soures, "Inertial Fusion Research Using the OMEGA Laser Facility," to be published in Physics Today.

J. M. Soures, S. J. Loucks, R. L. McCrory, C. P. Verdon, A. Babushkin, R. E. Bahr, T. R. Boehly, R. Boni, D. K. Bradley, D. L. Brown, J. A. Delettrez, R. S. Craxton, W. R. Donaldson, R. Epstein, R. Gram, D. R. Harding, P. A. Jaanimagi, S. D. Jacobs, K. Kearney, R. L. Keck, J. H. Kelly, T. J. Kessler, R. L. Kremens, J.P. Knauer, S. A. Letzring, D. J. Lonobile, L. D. Lund, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, A. Okishev, S. Papernov, G. Pien, W. Seka, R. W. Short, M. J. Shoup, III, M. D. Skeldon, S. Skupsky, A. W. Schmid, D. J. Smith, S. Swales, M. D. Wittman, and B. Yaakobi, "The Role of the Laboratory for Laser Energetics in the National Ignition Facility Project," to be published in Fusion Technology.

E. A. Startsev and C. J. McKinstrie, "Multiple Scale Derivation of the Relativistic Ponderomotive Force," to be published in Physical Review E.

C. Stockinger, W. Markowitsch, W. Lang, W. Kula, and R. Sobolewski, "Mechanisms of Photodoping in Oxygen-Deficient $\text{YBa}_2\text{Cu}_3\text{O}_x$ Films Studied by *In-Situ* Transport," to be published in Physical Review B.

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 Opti-

cally Transparent Aluminum Layers,” to be published in the Journal of Vacuum Science and Technology.

W. Xiong, Y. Kostoulas, X. Weng, P. M. Fauchet, and R. Sobolewski, “Femtosecond Study of the Electronic Structure in Semiconducting Y-Ba-Cu-O,” to be published in Physical Review B.

Z. Xu, Ju. V. Vandyshev, P. M. Fauchet, C. W. Rella, H. A. Schwettman, and C. C. Tsai, “Ultrafast Excitation and De-excitation of Local Vibrational Modes in a Solid Matrix: The Si-H Bond in Amorphous Silicon,” to be published in the Proceedings of OSA’s Tenth International Topical Meeting on Ultrafast Phenomena, San Diego, CA, 28 May–1 June 1996.

B. Yaakobi, F. J. Marshall, D. K. Bradley, J. A. Delettrez, R. S. Craxton, and R. Epstein, “Signatures of Target Performance and Mixing in Titanium-Doped Target Implosions on OMEGA,” to be published in Physics of Plasmas.

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.

J. D. Zuegel and W. Seka, “Upconversion and Reduced $^4F_{3/2}$ Upper-State Lifetime in Intensely Pumped Nd:YLF,” to be published in Optics Letters.

Conference Presentations

The following presentations were made at the Twelfth Topical Meeting on Advanced Solid-State Lasers, Orlando, FL, 27–29 January 1997:

A. Babushkin, W. Bittle, S. A. Letzring, A. Okishev, M. D. Skeldon, and W. Seka, “Stable, Reproducible, and Externally Synchronizable Regenerative Amplifier for Shaped Optical Pulses for the OMEGA Laser System.”

A. V. Okishev and W. Seka, “Diode-Pumped, Single-Frequency Pulsed Master Oscillator for the 60-Beam OMEGA Laser Facility.”

A. Okishev and W. Seka, “Diode-Pumped, Single-Frequency Nd:YLF Laser for the 60-Beam OMEGA Laser Pulse-Shaping System,” LASE ’97, San Jose, CA, 8–14 February 1997.

The following presentations were made at the Second International Workshop on Laser Plasma Interaction Physics, Banff, Alberta, Canada, 19–22 February 1997:

A. V. Chirikikh, W. Seka, and J. A. Delettrez, “Scattered Light Spectra Taken on OMEGA Implosion Experiments.”

C. J. McKinstrie, A. V. Kanaev, and E. J. Turano, “Sideward Simulated Raman Scattering of a Short Laser Pulse in a Plasma Channel.”

R. W. Short and A. Simon, “Collisionless Damping of Plasma Waves Propagating in Filaments and Consequences for SRS in Filaments.”

T. R. Boehly, R. L. McCrory, C. P. Verdon, W. Seka, S. J. Loucks, A. Babushkin, R. E. Bahr, R. Boni, D. K. Bradley, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, D. Harding, P. A. Jaanimagi, S. D. Jacobs, K. Kearney, R. L. Keck, J. H. Kelly, T. J. Kessler, R. L. Kremens, J. P. Knauer, D. J. Lonobile, L. D. Lund, F. J. Marshall, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, A. Okishev, S. Papernov, G. Pien, T. Safford, J. D. Schnittman, R. Short, M. J. Shoup III, M. Skeldon, S. Skupsky, A. W. Schmid, V. A. Smalyuk, D. J. Smith, J. M. Soures, M. Wittman, and B. Yaakobi, “Inertial Confinement Fusion Experiments with OMEGA—A 30-kJ, 60-Beam UV Laser,” 1997 IAEA Conference, Osaka, Japan, 10–14 March 1997.

R. L. McCrory and J. M. Soures, “Status of Direct-Drive Inertial Confinement Fusion Research at the Laboratory for Laser Energetics,” Second Symposium on Current Trends in International Fusion Research Review and Assessment, Washington, DC, 10–14 March 1997 (invited).

The following presentations were made at Ultrafast Electronics and Optoelectronics, Incline Village, NV, 17–21 March 1997:

K. Green, M. Lindgren, T. Y. Hsiang, R. Sobolewski, and L. Fuller, “Picosecond Photoresponse in Polycrystalline Silicon.”

D. Jacobs-Perkins, M. Currie, C.-C. Wang, C. Williams, W. R. Donaldson, R. Sobolewski and T. Y. Hsiang, “Analysis of an Interferometric Subpicosecond Imager Based on the Electro-Optic Effect.”

M. Lindgren, M. Currie, C. Williams, T. Y. Hsiang, P. M. Fauchet, R. Sobolewski, S. H. Moffat, R. A. Hughes, J. S. Preston, and F. A. Hegmann, “An Ultrafast High- T_c Superconducting Y-Ba-Cu-O Photodetector.”

The following presentations were made at the 1997 Applications of High Field and Short Wavelength Sources VII (OSA), Santa Fe, NM, 19–22 March 1997:

B. Buerke, J. P. Knauer, S. J. McNaught, and D. D. Meyerhofer, “Precision Tests of Laser-Tunneling Ionization Models.”

J. L. Chaloupka, T. J. Kessler, and D. D. Meyerhofer, “A Three-Dimensional Ponderomotive Trap for High-Energy Electrons.”

F. Yang, D. Golini, H. Edwards, D. H. Raguin, and S. D. Jacobs, “Planarization of Gratings Using Magnetorheological Finishing,” MRS 1997 Spring Meeting, San Francisco, CA, 31 March–4 April 1997.