
Publications and Conference Presentations

Publications

- J. L. Chaloupka, Y. Fisher, T. J. Kessler, and D. D. Meyerhofer, "A Single-Beam, Ponderomotive-Optical Trap for Free Electrons and Neutral Atoms," *Opt. Lett.* **22**, 1021 (1997).
- 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," *Macromolecules* **30**, 4049 (1997).
- R. Epstein, "Reduction of Time-Averaged Irradiation Speckle Nonuniformity in Laser-Driven Plasmas due to Target Ablation," *J. Appl. Phys.* **82**, 2123 (1997).
- M. L. Hoppe, R. B. Stephens, and D. Harding, "Characterization of Chemical Dopants in ICF Targets," *Fusion Technol.* **31**, 504 (1997).
- O. A. Konoplev, Y. Fisher, I. A. Walmsley, and D. D. Meyerhofer, "Determination of the Third-Order Nonlinearities of Materials by Use of Frequency-Domain Interferometry," in *Conference on Lasers and Electro-Optics*, 1997 OSA Technical Digest Series, Vol. 11 (OSA, Washington, DC, 1997), pp. 275–276.
- R. L. Kremens, J. T. Canosa, D. Brown, T. Hinterman, S. L. Letzring, M. Litchfield, D. Lonobile, R. G. Roides, M. Thomas, and R. Weaver, "The OMEGA Laser Electronic Timing System," *Rev. Sci. Instrum.* **68**, 943 (1997).
- C. J. McKinstrie and E. A. Startsev, "Dephasing Time of an Electron Accelerated by a Laser Pulse," *Phys. Rev. E* **56**, 2130 (1997).
- C. J. McKinstrie and E. J. Turano, "Spatiotemporal Evolution of Parametric Instabilities Driven by Short Laser Pulses: Two-Dimensional Analysis," *Phys. Plasmas* **4**, 3347 (1997).
- S. J. McNaught, J. P. Knauer, and D. D. Meyerhofer, "Photoelectron Drift Momentum in the Long-Pulse Tunneling Limit for an Elliptically Polarized Laser," *Laser Phys.* **7**, 712 (1997).
- A. V. Okishev and W. Seka, "Diode-Pumped, Single-Frequency, Pulsed Master Oscillator for the 60-Beam OMEGA Laser Facility," in *Conference on Lasers and Electro-Optics*, 1997 OSA Technical Digest Series, Vol. 11 (OSA, Washington, DC, 1997), pp. 352–353.
- A. V. Okishev, W. Seka, J. H. Kelly, S. F. B. Morse, J. M. Soures, M. D. Skeldon, A. Babushkin, R. L. Keck, and R. G. Roides, "Pulse-Shaping System Implementation on the 60-Beam OMEGA Laser," in *Conference on Lasers and Electro-Optics*, 1997 OSA Technical Digest Series, Vol. 11 (OSA, Washington, DC, 1997), p. 389.
- 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," *Appl. Opt.* **36**, 5827 (1997).
- M. D. Skeldon, R. Saager, A. Okishev, and W. Seka, "Thermal Distortions in Laser-Diode- and Flash-Lamp-Pumped Nd:YLF Laser Rods," in *Conference on Lasers and Electro-Optics*, 1997 OSA Technical Digest Series, Vol. 11 (OSA, Washington, DC, 1997), p. 353.

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*.

E. L. Alfonso, S.-H. Chen, R. Q. Gram, and D. R. Harding, "Properties of Polyimide Shells Made Using Vapor Phase Deposition," to be published in the *Journal of Materials Research*.

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, "Feedthrough and Dynamic Stabilization in Convergent Geometry," to be published in the Proceedings of the Thirteenth International Conference on Laser Interactions and Related Plasma Phenomena (LIRPP), Monterey, CA, 13–18 April 1997.

R. Betti, V. N. Goncharov, R. L. McCrory, and C. P. Verdon, "Growth Rates of the Ablative Rayleigh–Taylor Instability in Inertial Confinement Fusion," to be published in *Physics of Plasmas*.

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. McCrory, S. J. Loucks, J. M. Soures, C. P. Verdon, A. Babushkin, R. E. Bahr, R. Boni, D. K. Bradley, D. L. Brown, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, R. Epstein, 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. Kumpan, 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. Short, M. J. Shoup III, M. Skeldon, S. Skupsky, A. W. Schmid, D. J. Smith, S. Swales, M. Wittman, and B. Yaakobi, "The First Year of ICF Experiments on OMEGA—A 60-Beam, 60-TW Laser

System," to be published in the Proceedings of the 16th IAEA Fusion Energy Conference, Montreal, Canada, 7–11 October 1996.

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," to be published in the Proceedings of the 1997 IAEA Conference, Osaka, Japan, 10–14 March 1997.

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B. Buerke, J. P. Knauer, S. J. McNaught, and D. D. Meyerhofer, "Precision Tests of Laser-Tunneling Ionization Models," to be published in the Applications of High Field and Short Wavelength Sources VII, 1997 OSA Technical Digest Series.

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

M. Currie, C.-C. Wang, R. Sobolewski, and T. Y. Hsiang, "Picosecond Nodal Testing of Centimeter-Size Superconducting Microstrip Interconnects," to be published in *Applied Superconductivity*.

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*.

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

D. Fried, R. E. Glens, J. D. B. Featherstone, and W. Seka, "Permanent and Transient Changes in the Reflectance of CO₂ 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 and S. D. Jacobs, "Bound Abrasive Polishers for Optical Materials," to be published in the *Journal of Applied Optics*.

W. Gob, W. Lang, and Roman Sobolewski, "Magnetoresistance of a YBa₂Cu₃O₇ Corbino Disk: Probing Geometrical Contributions to the Unconventional Normal-State Magnetoresistance of High-Temperature Superconductors," to be published in *Physical Review B: Rapid Communications*.

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*.

K. Green, M. Lindgren, C.-C. Wang, L. Fuller, T. Y. Hsiang, W. Seka, and R. Sobolewski, "Picosecond Photoresponse in Polycrystalline Silicon," to be published in the *Proceedings of Ultrafast Electronics and Optoelectronics, Incline Village, NV, 17-21 March 1997*.

M. J. Guardalben, "Conoscopic 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, K. T. Tang, C.-C. Wang, C. Williams, W. R. Donaldson, R. Sobolewski, and T. Y. Hsiang, "Subpicosecond Electro-Optic Imaging Using Interferometric and Polarization-Based Apparatus," to be published in the *Proceedings of Ultrafast Electronics and Optoelectronics, Incline Village, NV, 17-21 March 1997*.

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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*.

J. P. Knauer, D. D. Meyerhofer, T. R. Boehly, D. Ofer, C. P. Verdon, D. K. Bradley, P. W. McKenty, V. A. Smalyuk, S. G. Glendinning, and R. G. Watt, "Single-Mode Rayleigh-Taylor Growth-Rate Measurements with the OMEGA Laser System," to be published in the *Proceedings of the Thirteenth International Conference on Laser Interactions and Related Plasma Phenomena (LIRPP), Monterey, CA, 13-18 April 1997*.

E. M. Korenic, S. D. Jacobs, S. M. Faris, and L. Li, "Cholesteric Liquid Crystal Flakes—A New Form of Domain," to be published in *Molecular Crystals and Liquid Crystals*.

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E. M. Korenic, S. D. Jacobs, S. M. Faris, and L. Li, "Color Gamut of Cholesteric Liquid Crystal Films and Flakes by Standard Colorimetry," to be published in *COLOR Research and Application*.

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, S. H. Moffat, R. A. Hughes, J. S. Preston, and F. A. Hegmann, "Ultrafast Photoresponse and Pulse Propagation in High- T_c Superconducting Y-Ba-Cu-O Thin Film Devices," to be published in the IEEE Journal on Selected Topics in Quantum Electronics.

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M. Lindgren, W.-S. Zeng, 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," to be published in the Proceedings of Ultrafast Electronics and Optoelectronics, Incline Village, NV, 17–21 March 1997.

M. Lindgren, W.-S. Zeng, M. Currie, R. Sobolewski, S. Cherednichenko, B. Voronov, and G. N. Gol'tsman, "Picosecond Response of a Superconducting Hot-Electron NbN Photodetector," to be published in Applied Superconductivity.

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.

F. J. Marshall, M. M. Allen, J. P. Knauer, J. A. Oertel, and T. Archuleta, "A High-Resolution X-Ray Microscope for Laser-Driven Planar-Foil Experiments," to be published in Physics of Plasmas.

S. M. McCormack, D. Fried, J. D. B. Featherstone, R. E. Glens, 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).

C. J. McKinstrie, J. S. Li, and A. V. Kanaev, "Near-Forward Stimulated Brillouin Scattering," to be published in Physics of Plasmas.

C. J. McKinstrie, A. V. Kanaev, V. T. Tikhonchuk, R. E. Giacone, and H. X. Vu, "Three-Dimensional Analysis of the Power Transfer Between Crossed Laser Beams," to be published in Physics of Plasmas.

B. Nodland and C. J. McKinstrie, "Propagation of a Short Laser Pulse in a Plasma," to be published in Physical Review E.

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 the Journal of Computational Chemistry.

S. Papernov, A. W. Schmid, and D. Zaksas, "Characterization of Freestanding Polymer Films for Application in 351-nm, High-Peak-Power Laser Systems," to be published in Optical Engineering.

S. Papernov, A. W. Schmid, and F. Dahmani, "Laser Damage in Polymer Waveguides Driven Purely by a Nonlinear, Transverse-Scattering Process," to be published in Optics Communications.

S. Papernov and A. W. Schmid, "Localized Absorption Effects During 351-nm, Pulsed Laser Irradiation of Dielectric Multilayer Thin Films," to be published in the Journal of Applied Physics.

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, "Impllosion 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.

W. Seka, A. Babushkin, T. R. Boehly, D. K. Bradley, M. D. Cable, R. S. Craxton, J. A. Delettrez, W. R. Donaldson, D. R. Harding, P. A. Jaanimagi, R. L. Keck, J. H. Kelly, T. J. Kessler, J. P. Knauer, R. L. Kremens, F. J. Marshall, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, S. F. B. Morse, A. V. Okishev, G. Pien, M. D. Skeldon, J. M. Soures, C. P. Verdon, B. Yaakobi, and J. D. Zuegel, "OMEGA Experimental Program and Recent Results," to be published in the Proceedings of the Thirteenth International Conference on Laser Interactions and Related Plasma Phenomena (LIRPP), Monterey, CA, 13–18 April 1997.

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.

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.

M. D. Skeldon, R. Saager, and W. Seka, "Quantitative Pump-Induced Wavefront Distortions in Laser-Diode- and Flash-Lamp-Pumped Nd:YLF Laser Rods," to be published in 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.

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 Z Phys. B.

B. Yaakobi and F. J. Marshall, "Imaging the Cold, Compressed Shell in Laser Implosions Using the $K\alpha$ Fluorescence of a Titanium Dopant," to be published in Physical Review E.

F. Yang, D. Golini, D. H. Raguin, and S. D. Jacobs, "Planarization of Gratings Using Magnetorheological Finishing," to be published in the Proceedings: Session P—Semiconductor Surface Preparation, MRS Spring Meeting, San Francisco, CA, 2 April 1997.

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

J. M. Larkin, W. R. Donaldson, T. H. Foster, and R. S. Knox, "Multiphoton Excitation of Rose Bengal by Near-Infrared Light," 25th Annual Meeting of the American Society for Photobiology, St. Louis, MO, 5–10 July 1997.

S. D. Jacobs, W. I. Kordonski, and H. M. Pollicove, "Precision Control of Aqueous Magnetorheological Fluids for Finishing of Optics," 6th International Conference on Electrorheological Fluids, Magnetorheological Suspensions, and Their Applications, Yonezawa, Japan, 22–25 July 1997.

The following presentations were made at the Fifth International Conference on Advances in the Fusion and Processing of Glass, Toronto, Canada, 27–31 July 1997:

S. D. Jacobs, "Deterministic Manufacturing of Precision Glass Optics Using Magnetorheological Finishing (MRF)."

J. C. Lambropoulos, S. D. Jacobs, B. Gillman, F. Yang, and J. Ruckman, "Subsurface Damage in Microgrinding Optical Glasses."

The following presentations were made at SPIE's 42nd Annual Meeting on Optical Science, Engineering, and Instrumentation, San Diego, CA, 27 July–1 August 1997:

B. E. Gillman, B. M. Reed, M. A. Atwood, J. L. Ruckman, D. J. Quesnel, T. T. Ochiner, and S. D. Jacobs, "Application of Coolants in Deterministic Microgrinding of Glass."

D. Golini, S. D. Jacobs, W. Kordonski, and P. Dumas, "Precision Optics Fabrication Using Magnetorheological Finishing."

S. D. Jacobs, F. Yang, E. M. Fess, J. B. Feingold, B. E. Gillman, W. I. Kordonski, H. Edwards, and D. Golini, "Magnetorheological Finishing of IR Materials."

J. C. Lambropoulos, B. E. Gillman, Y. Zhou, S. D. Jacobs, and H. J. Stevens, "Glass-Ceramics: Deterministic Microgrinding, Lapping, and Polishing."

D. D. Meyerhofer, X. D. Cao, Y. Fisher, O. Konoplev, I. Walmsley, and L. Zheng, "Measurements of Material Properties Using Frequency Domain Interferometry," Ultrafast Optics 1997, Monterey, CA, 4–7 August 1997.