
Publications and Conference Presentations

Publications

- V. Bagnoud, J. D. Zuegel, N. Forget, and C. Le Blanc, "High-Dynamic-Range Temporal Measurements of Short Pulses Amplified by OPCPA," *Opt. Exp.* **15**, 5504 (2007).
- R. Betti, C. D. Zhou, K. S. Anderson, J. L. Perkins, W. Theobald, and A. A. Solodov, "Shock Ignition of Thermonuclear Fuel with High Areal Density," *Phys. Rev. Lett.* **98**, 155001 (2007).
- P. Brijesh, T. J. Kessler, J. D. Zuegel, and D. D. Meyerhofer, "Demonstration of a Horseshoe-Shaped Longitudinal Focal Profile," *J. Opt. Soc. Am. B* **24**, 1 (2007).
- T. J. B. Collins, J. A. Marozas, R. Betti, D. R. Harding, P. W. McKenty, P. B. Radha, S. Skupsky, V. N. Goncharov, J. P. Knauer, and R. L. McCrory, "One-Megajoule, Wetted-Foam Target-Design Performance for the National Ignition Facility," *Phys. Plasmas* **14**, 056308 (2007) (invited).
- J. E. DeGroot, A. E. Marino, J. P. Wilson, A. L. Bishop, and S. D. Jacobs, "Material Removal Rate Model for Magneto-rheological Finishing (MRF) of Optical Glasses with Nano-diamond MR Fluid," in *Optifab 2007: Technical Digest*, SPIE Technical Digest (SPIE, Bellingham, WA, 2007), Vol. TD04, pp. TF040F.
- C. Dorrer and J. D. Zuegel, "Design and Analysis of Binary Beam Shapers Using Error Diffusion," *J. Opt. Soc. Am. B* **24**, 1268 (2007).
- C. Dorrer and J. D. Zuegel, "Optical Testing Using the Transport-of-Intensity Equation," *Opt. Express* **15**, 7165 (2007).
- D. H. Edgell, R. S. Craxton, L. M. Elasky, D. R. Harding, S. J. Verbridge, M. D. Wittman, and W. Seka, "Three-Dimensional Characterization of Spherical Cryogenic Targets Using Ray-Trace Analysis of Multiple Shadowgraph Views," *Fusion Sci. Technol.* **51**, 717 (2007).
- K. A. Fletcher, B. Apker, S. Hammond, J. Punaro, F. J. Marshall, J. Laine, and R. Forties, "Detection of Charged Particles with Charge Injection Devices," *Rev. Sci. Instrum.* **78**, 063301 (2007).
- G. Gol'tsman, O. Minaeva, A. Korneev, M. Tarkhov, I. Rubstova, A. Divochiy, I. Milostnaya, G. Chulkova, N. Kaurova, B. Voronov, D. Pan, J. Kitaygorsky, A. Cross, A. Pearlman, I. Komissarov, W. Slys, M. Wegrzecki, P. Grabiec, and R. Sobolewski, "Middle-Infrared to Visible-Light Ultrafast Superconducting Single-Photon Detectors," *IEEE Trans. Appl. Supercond.* **17**, 246 (2007).
- W. Guan and J. R. Marciante, "Single-Polarisation, Single-Frequency, 2 cm Ytterbium-Doped Fibre Laser," *Electron. Lett.* **43**, 558 (2007).
- J. Honig, J. Halpin, D. Browning, J. Crane, R. Hackel, M. Henesian, J. Peterson, D. Ravizza, T. Wennberg, H. Rieger, and J. Marciante, "Diode-Pumped Nd:YAG Laser with 38 W Average Power and User-Selectable, Flat-in-Time Subnanosecond Pulses," *Appl. Opt.* **46**, 3269 (2007).
- S. D. Jacobs, "Manipulating Mechanics and Chemistry in Precision Optics Finishing," *Sci. Technol. Adv. Mater.* **8**, 153 (2007).
- A. Jukna, I. Barbo, G. Jung, A. Abrutis, S. S. Banerjee, X. Li, D. Wang, and R. Sobolewski, "Noise Evidence for Intermittent Channeled Vortex Motion in Laser-Processed YBaCuO Thin Films," in *Noise and Fluctuations in Circuits, Devices, and Materials*, edited by M. Macucci, L. K. J. Vandamme, C. Ciofi, and M. B. Weissman (SPIE, Bellingham, WA, 2007), Vol. 6600, pp. 66001C.
- M. Khafizov, X. Li, Y. Cui, X. X. Xi, and R. Sobolewski, "Mechanism of Light Detection in Current-Biased Superconducting MgB₂ Microbridges," *IEEE Trans. Appl. Supercond.* **17**, 2867 (2007).
- J. Kitaygorsky, I. Komissarov, A. Jukna, D. Pan, O. Minaeva, N. Kaurova, A. Divochiy, A. Korneev, M. Tarkhov, B. Voronov, I. Milostnaya, G. Gol'tsman, and R. Sobolewski, "Dark Counts

in Nanostructured NbN Superconducting Single-Photon Detectors and Bridges,” *IEEE Trans. Appl. Supercond.* **17**, 275 (2007).

A. Korneev, O. Minaeva, A. Divochiy, A. Antipov, N. Kaurova, B. Seleznev, B. Voronov, G. Gol’tsman, D. Pan, J. Kitaygorsky, W. Slysz, and R. Sobolewski, “Ultrafast and High Quantum Efficiency Large-Area Superconducting Single-Photon Detectors,” in *Photon Counting Applications, Quantum Optics, and Quantum Cryptography*, edited by I. Prochazka, A. L. Migdall, A. Pauchard, M. Dusek, M. S. Hillery, and W. P. Schleich (SPIE, Bellingham, WA, 2007), Vol. 6583, pp. 65830I.

G. A. Kyrala, D. C. Wilson, J. F. Benage, M. Gunderson, K. Klare, J. Frenje, R. Petrasso, W. Garbett, S. James, V. Glebov, and B. Yaakobi, “Effect of Higher z Dopants on Implosion Dynamics: X-Ray Spectroscopy,” *High Energy Density Phys.* **3**, 163 (2007).

X. Li, M. Khafizov, Š. Chromik, M. Valerianova, V. Štrbík, P. Odier, and R. Sobolewski, “Ultrafast Photoresponse Dynamics of Current-Biased Hg-Ba-Ca-Cu-O Superconducting Microbridges,” *IEEE Trans. Appl. Supercond.* **17**, 3648 (2007).

R. L. McCrory, “Highlights of the History of the University of Rochester,” in *Inertial Confinement Nuclear Fusion: A Historical Approach by Its Pioneers*, edited by G. Velarde and N. Carpintero-Santamaria (Foxwell & Davies (UK) Ltd., London, 2007), pp. 127–166.

R. L. McCrory, D. D. Meyerhofer, R. Betti, T. R. Boehly, R. S. Craxton, T. J. B. Collins, J. A. Delettrez, R. Epstein, V. Yu. Glebov, V. N. Goncharov, D. R. Harding, R. L. Keck, J. H. Kelly, J. P. Knauer, S. J. Loucks, L. D. Lund, J. A. Marozas, P. W. McKenty, F. J. Marshall, S. F. B. Morse, P. B. Radha, S. P. Regan, S. Roberts, W. Seka, S. Skupsky, V. A. Smalyuk, C. Sorce, C. Stoeckl, J. M. Soures, R. P. J. Town, B. Yaakobi, J. A. Frenje, C. K. Li, R. D. Petrasso, F. H. Séguin, K. Fletcher, S. Padalino, C. Freeman, and T. C. Sangster, “Direct-Drive Inertial Confinement Fusion Research at the Laboratory for Laser Energetics,” in *Current Trends in International Fusion Research—Proceedings of the Fourth Symposium*, edited by C. D. Orth and E. Panarella (NRC Research Press, Ottawa, Canada, 2007), pp. 367–386.

A. V. Okishev, C. Dorrer, V. I. Smirnov, L. B. Glebov, and J. D. Zuegel, “Spectral Filtering in a Diode-Pumped Nd:YLF Regenerative Amplifier Using a Volume Bragg Grating,” *Opt. Express* **15**, 8197 (2007).

D. Pan, W. Donaldson, and R. Sobolewski, “Femtosecond Laser-Pumped Source of Entangled Photons for Quantum Cryptography Applications,” in *Photon Counting Applications, Quantum Optics, and Quantum Cryptography*, edited by M. Dusek, M. S. Hillery, W. P. Schleich, A. L. Migdall, A. Pauchard, and I. Prochazka (SPIE, Bellingham, WA, 2007), Vol. 6583, pp. 65830K.

S. P. Regan, R. Epstein, V. N. Goncharov, I. V. Igumenshchev, D. Li, P. B. Radha, H. Sawada, W. Seka, T. R. Boehly, J. A. Delettrez, O. V. Gotchev, J. P. Knauer, J. A. Marozas, F. J. Marshall, R. L. McCrory, P. W. McKenty, D. D. Meyerhofer, T. C. Sangster, D. Shvarts, S. Skupsky, V. A. Smalyuk, B. Yaakobi, and R. C. Mancini, “Laser-Absorption, Mass Ablation Rate, and Shock Heating in Direct-Drive Inertial Confinement Fusion,” *Phys. Plasmas* **14**, 056305 (2007) (invited).

J. R. Rygg, J. A. Frenje, C. K. Li, F. H. Séguin, R. D. Petrasso, V. Yu. Glebov, D. D. Meyerhofer, T. C. Sangster, and C. Stoeckl, “Time-Dependent Nuclear Measurements of Mix in Inertial Confinement Fusion,” *Phys. Rev. Lett.* **98**, 215002 (2007).

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W. Seka, P. Rechmann, J. D. B. Featherstone, and D. Fried, “Laser Ablation of Dental Hard Tissue,” *J. Laser Dent.* **15**, 61 (2007).

S. N. Shafir, J. C. Lambropoulos, and S. D. Jacobs, “Micromechanical Contributions to Material Removal and Surface Finish,” in *Optifab 2007: Technical Digest*, SPIE Technical Digest (SPIE, Bellingham, WA, 2007), Vol. TD04, pp. TF0407.

W. Slysz, M. Wegrzecki, J. Bar, P. Grabiec, M. Gorska, E. Reiger, S. Dorenbos, V. Zwiller, I. Milostnaya, O. Minaeva, A. Antipov, O. Okunev, A. Korneev, K. Smirnov, B. Voronov, N. Kaurova, G. N. Gol’tsman, J. Kitaygorsky, D. Pan, A. Pearlman, A. Cross, I. Komissarov, and R. Sobolewski,

“Fiber-Coupled NbN Superconducting Single-Photon Detectors for Quantum Correlation Measurements,” in *Photon Counting Applications, Quantum Optics, and Quantum Cryptography*, edited by I. Prochazka, A. L. Migdall, A. Pauchard, M. Dusek, M. S. Hillery, and W. P. Schleich (SPIE, Bellingham, WA, 2007), Vol. 6583, pp. 65830J.

A. A. Solodov, R. Betti, J. A. Delettrez, and C. D. Zhou, “Gain Curves and Hydrodynamic Simulations of Ignition and Burn for Direct-Drive Fast-Ignition Fusion Targets,” *Phys. Plasmas* **14**, 062701 (2007).

T. Taneda, G. P. Pepe, L. Parlato, A. A. Golubov, and R. Sobolewski, “Time-Resolved Carrier Dynamics and Electron-Phonon Coupling Strength in Proximized Weak

Ferromagnet/Superconductor Nanobilayers,” *Phys. Rev. B* **75**, 174507 (2007).

D. Wang, A. Cross, G. Guarino, S. Wu, R. Sobolewski, and A. Mycielski, “Time-Resolved Dynamics of Coherent Acoustic Phonons in CdMnTe Diluted-Magnetic Single Crystals,” *Appl. Phys. Lett.* **90**, 211905 (2007).

L. Welser-Sherrill, R. C. Mancini, J. A. Koch, N. Izumi, R. Tommasini, S. W. Haan, D. A. Haynes, I. E. Golovkin, J. A. Delettrez, F. J. Marshall, S. P. Regan, and V. A. Smalyuk, “Development of Spectroscopic Tools for the Determination of Temperature and Density Spatial Profiles in Implosion Cores,” *High Energy Density Phys.* **3**, 287 (2007).

Forthcoming Publications

A. C.-A. Chen, J. U. Wallace, K. P. Klubek, M. B. Madaras, C. W. Tang, and S. H. Chen, “Effects of Emitter Layer’s Chemical Composition on the Efficiency of Organic Blue Light-Emitting Diodes,” to be published in *Chemistry of Materials*.

C. Dorrer, I. A. Begishev, A. V. Okishev, and J. D. Zuegel, “High-Contrast Ultrafast Optical Parametric Amplifier as a Front End of High-Power Laser Systems,” to be published in *Optics Letters*.

C. Dorrer, A. V. Okishev, I. A. Begishev, J. D. Zuegel, V. I. Smirnov, and L. B. Glebov, “Optical Parametric Chirped-Pulse-Amplification Contrast Enhancement by Regenerative Pump Spectral Filtering,” to be published in *Optics Letters*.

V. N. Goncharov, “Ablative Richtmyer–Meshkov Instability: Theory and Experimental Results,” to be published in the *Proceedings of Scottish Summer School*.

V. N. Goncharov, “Direct-Drive Inertial Fusion: Basic Concepts and Ignition Target Designing,” to be published in the *Proceedings of Scottish Summer School*.

H. Huang and T. Kessler, “Tiled-Grating Compressor with Uncompensated Dispersion for Near-Field-Intensity Smoothing,” to be published in *Optics Letters*.

I. V. Igumenshchev, V. N. Goncharov, W. Seka, D. H. Edgell, and T. R. Boehly, “The Effect of Resonance Absorption in

OMEGA Direct-Drive Designs and Experiments,” to be published in *Physics of Plasmas*.

I. Kang and C. Dorrer, “Method of Optical Pulse Characterization Using Sinusoidal Optical Phase Modulations,” to be published in *Optics Letters*.

J. R. Marciante, W. R. Donaldson, and R. G. Roides, “Averaging of Replicated Pulses for Enhanced Dynamic Range, Single-Shot Measurement of Nanosecond Optical Pulses,” to be published in *IEEE Photonics Technology Letters*.

J. Qiao, A. Kalb, M. J. Guardalben, G. King, D. Canning, R. Jungquist, and J. H. Kelly, “Large-Aperture Grating Tiling by Interferometry for Chirped-Pulse–Amplification Systems,” to be published in *Optics Express*.

E. Reiger, S. Dorenbos, V. Zwiller, A. Korneev, G. Chulkova, I. Milostnaya, O. Minaeva, G. Gol’tsman, W. Słysz, J. Kitaygorsky, D. Pan, A. Jukna, and R. Sobolewski, “Spectroscopy with Nanostructured Superconducting Single-Photon Sources,” to be published in *IEEE Journal of Selected Topics of Quantum Electronics*.

T. C. Sangster, R. L. McCrory, V. N. Goncharov, D. R. Harding, S. J. Loucks, P. W. McKenty, D. D. Meyerhofer, S. Skupsky, B. A. Hammel, J. D. Lindl, E. Moses, J. Atherton, G. B. Logan, S. Yu, J. D. Kilkenny, A. Nikroo, H. Wilken, K. Matzen, R. Leeper, R. Olsen, J. Porter, C. Barnes, J. C. Fernandez, D. Wilson, J. D. Sethian, and S. Obenschain, “Overview of

Inertial Fusion Research in the United States,” to be published in *Nuclear Fusion*.

S. N. Shafir, J. C. Lambropoulos, and S. D. Jacobs, “Subsurface Damage and Microstructure Development in Precision Microground Hard Ceramics Using Magnetorheological Finish ing Spots,” to be published in *Applied Optics*.

S. N. Shafir, J. C. Lambropoulos, and S. D. Jacobs, “Technical Note: Toward Magnetorheological Finishing of Magnetic Materials,” to be published in the *Journal of Manufacturing Science and Engineering*.

A. Simon, “Comment on ‘Magnetic Field Effects on Gas Discharge Plasmas’ [Phys. Plasmas **13**, 163511 (2006)],” to be published in *Physics of Plasmas*.

L. Sun and J. R. Marciante, “Filamentation Analysis in Large-Mode-Area Fiber Lasers,” to be published in the *Journal of the Optical Society of America B*.

S. Wu, P. Geiser, J. Jun, J. Karpinski, and R. Sobolewski, “Femtosecond Optical Generation and Detection of Coherent Acoustic Phonons in GaN Single Crystals,” to be published in *Physical Review B*.

C. D. Zhou and R. Betti, “Hydrodynamic Relations for Direct-Drive Fast-Ignition and Conventional Inertial Confinement Fusion Implosions,” to be published in *Physics of Plasmas*.

Conferences Presentations

The following presentations were made at SPIE Europe: Optics and Optoelectronics, Prague, Czech Republic, 16–19 April 2007:

D. Pan, W. R. Donaldson, and R. Sobolewski, “Femtosecond Laser-Pumped Source of Entangled Photons for Quantum Cryptography Applications.”

R. Sobolewski, “Fiber-Coupled NbN Superconducting Single-Photon Detectors for Quantum Correlation Measurements.”

The following presentations were made at CLEO/QELS 2007, Baltimore, MD, 6–11 May 2007:

P. Brijesh, T. J. Kessler, J. D. Zuegel, and D. D. Meyerhofer, “Spatially Shaping the Longitudinal Focal Distribution into a Horseshoe-Shaped Profile.”

W. R. Donaldson, D. N. Maywar, and J. H. Kelly, “Measurement of the Self-Phase-Modulation-Induced Bandwidth in a 30-kJ-Class Laser-Amplifier System.”

C. Dorrer, “Pulse Shaping Using Binary Sequences Designed with Error Diffusion.”

C. Dorrer and J. D. Zuegel, “Characterization of High-Frequency Surface Modulation Using the Transport-of-Intensity Equation.”

J. R. Marciante, “Effectiveness of Radial Index Tailoring in Large-Mode-Area Fiber Lasers and Amplifiers.”

J. R. Marciante, “Gain Filtering for Single-Spatial-Mode Operation of Large-Mode-Area Fiber Amplifiers.”

J. Qiao, D. Canning, G. King, M. J. Guardalben, J. Price, A. Kalb, R. Jungquist, A. L. Rigatti, and J. H. Kelly, “Interferometric Tiling for Large-Aperture Gratings for Petawatt Laser Systems.”

The following presentations were made at Optifab 2007, Rochester, NY, 14–17 May 2007:

J. E. DeGroot, A. E. Marino, J. P. Wilson, A. L. Bishop, and S. D. Jacobs, “Material Removal Rate Model for Magnetorheological Finishing (MRF) of Optical Glasses with Nanodiamond MR Fluid.”

S. N. Shafir, J. C. Lambropoulos, and S. D. Jacobs, "Surface Finish and Subsurface Damage in Polycrystalline Optical Materials."

K. L. Marshall, K. Hasman, M. Leitch, G. Cox, T. Z. Kosc, A. Trajkovska-Petkoska, and S. D. Jacobs, "Doped Multi-layer Polymer Cholesteric-Liquid-Crystal (PCLC) Flakes: A Novel Electro-Optical Medium for Highly Reflective Color Flexible Displays," SID 2007 Symposium, Long Beach, CA, 20–25 May 2007.

K. L. Marshall, V. Rapson, Y. Zhang, G. Mitchell, and A. L. Rigatti, "Contaminant Resistant Sol-Gel Coatings for High Peak Power Laser Applications," Optical Interference Coatings (OSA-OIC), Tucson, AZ, 3–8 June 2007.

S. G. Lukishova, L. J. Bissell, S. K. H. Wei, A. W. Schmid, Z. Shi, H. Shin, R. Knox, P. Freivald, R. W. Boyd, C. R. Stroud, Jr., S.-H. Chen, and K. L. Marshall, "Room-Temperature Single Photon Sources with Fluorescent Emitters in Liquid Crystal Hosts," International Conference on Quantum Information, Rochester, NY, 13–15 June 2007.

The following presentations were made at the 15th APS Topical Conference on Shock Compression of Condensed Matter, Fairmont Orchard, HI, 24–29 June 2007:

T. R. Boehly, J. E. Miller, J. H. Eggert, D. G. Hicks, P. M. Celliers, D. D. Meyerhofer, and G. W. Collins, "Measurements of the Release of Alpha Quartz: A New Standard for Impedance-Match Experiments."

S. Brygoo, J. H. Eggert, P. Loubeyre, R. S. McWilliams, D. G. Hicks, P. M. Celliers, T. R. Boehly, R. Jeanloz, and G. W. Collins, "The Equation of State and Optical Conductivity of Warm Dense He and H₂."

J. Eggert, D. Bradley, P. Celliers, G. Collins, D. Hicks, D. Braun, S. Prisbey, R. Smith, and T. Boehly, "Ramp Compression of Diamond to Over 1000 GPa."

D. Hicks, J. Eggert, P. Celliers, H.-S. Park, S. LePape, P. Patel, B. Maddox, G. Collins, T. Boehly, and B. Barbrel, "Measurement of Shock Wave Density Using Quantitative X-Ray Phase Contrast Imaging."

J. E. Miller, T. R. Boehly, D. D. Meyerhofer, J. H. Eggert, S. C. Wilks, J. H. Satcher, and J. F. Poco, "Equation-of-State Measurements in Ta₂O₅ Aerogel."

The following presentations were made at the ITER-LMJ-NIF International Workshop, Cadarache, France, 27–29 June 2007:

V. Yu. Glebov, T. C. Sangster, C. Stoeckl, S. Roberts, M. Cruz, C. Mileham, M. J. Moran, R. A. Lerche, J. M. Mack, H. Herrmann, C. S. Young, J. L. Bourgade, O. Land-oas, J. Raimbourg, G. A. Chandler, and K. Miller, "Environmental Challenges for the Nuclear Diagnostics on the NIF and LMJ."

W. T. Shmayda, "Tritium Management on OMEGA."