

First Degree Innovation

REFEREED PAPERS

1. "Dressed quantum graphs with optical nonlinearities approaching the fundamental limits," R. Lytel and MG Kuzyk, arXiv:1308.6800. Submitted to the Journal of Nonlinear Optical Physics and Materials (2013).
2. "Scaling and universality in nonlinear optical quantum graphs containing star motifs," Rick Lytel, Shoresh Shafei, and Mark G. Kuzyk, arXiv:1305.4334. Submitted to the European Journal of Physics (2013).
3. "Topological optimization of nonlinear optical quantum wire networks," R. Lytel, S. Shafei, and MG Kuzyk, SPIE OP210-15, San Diego CA (2013).
4. "Influence of geometry and topology of quantum graphs on their nonlinear optical properties," Rick Lytel, Shoresh Shafei, Julian H. Smith, and Mark G. Kuzyk, Phys. Rev. A 87, 043824 (2013).
5. "Geometry-controlled nonlinear optical response of quantum graphs," S. Shafei, R. Lytel, and MG Kuzyk, J Opt Soc Am B 29, 3419 (2012).
6. "Using geometry to enhance the nonlinear response of quantum confined systems," S. Shafei, R. Lytel, and MG Kuzyk, Proc SPIE 8474 (2012).
7. "Nonlinear optics of quantum graphs," R. Lytel, S. Shafei, and MG Kuzyk, Proc SPIE 8474 (2012).
8. "Challenges and potentials for multi-Terabit-per-second Optical Transceivers," A.V. Krishnamoorthy, D. Huang, T. Sze, R. Drost, R. Ho, H. Davidson, and R. Lytel, Biophotonics/Optical Interconnects and VLSI Photonics/WBM Microcavities, 2004 Digest of the LEOS Summer Topical Meetings (2004).
9. "The chip multithreading architecture and parallel optical interconnects," D. Huang, T. Sze, A.V. Krishnamoorthy, A. Del Alamo, D. Beckman, S. Fazelpour, H. Davidson, J. Cooley, and R. Lytel, IEEE Summer Topical Meeting on Optical Interconnects, San Diego (2004).
10. "Optical interconnects, out of the box forever?" D. Huang, T. Sze, A. Landin, R. Lytel, H.L. Davidson, IEEE Journal of Selected Topics on Quantum Electronics, 9, 614 (2003).
11. "Optical interconnections within modern high-performance computing systems," R. Lytel, H.L. Davidson, N. Nettleton, and T. Sze, Proc. IEEE 88, 758 (2000).
12. "Prospects for free-space optics in digital systems," IEEE LEOS 12th annual meeting 2, 880 (San Francisco, CA Nov 1999).
13. "Solid state single mode fiber optic 1xN switches," R. Lytel, G.F. Lipscomb, J.I. Thackara, IEEE LEOS '96, 2, 93 (1996).
14. "Packaging and applications of active polymer optical switching arrays", R. Lytel and G.F. Lipscomb, in Optoelectronic Interconnects and Packaging: Critical Reviews of Optical Science and Technology", SPIE Vol. CR62, pp. 431-441 (1996).
15. "Large-scale integration of electro-optic polymer devices for MPP applications", R. Lytel, G.F. Lipscomb, and A.J. Ticknor, Proc. Int'l Conference on Massively Parallel Processors, Delft University, the Netherlands (1994).
16. "EO polymer materials and devices: From research to reality," R. Lytel, IEEE NLO '94, p. 3 (1994).
17. "Future Prospects of Polymers in Nonlinear Optical Applications", Trends in Polymer Science 2, 114 (1994).
18. "Electro-optic Polymer Devices", R. Lytel and G.F. Lipscomb, in Electronic Packaging Materials Science VI, Materials Research Society Vol. 264, pp. 363-378 (1992).
19. "Manufacturable integrated optical interconnection networks for electronic systems," R. Lytel, T.E. Van Eck, D.G. Girton, J.F. Valley, S. Ermer, G.F. Lipscomb, and A.J. Ticknor, IEEE LEOS '92, p. 100 (1992).
20. "Poled polymer integrated photonic interconnect networks for electronic systems," T.E. Van Eck, G.F. Lipscomb, and R. Lytel, Telesystems Conference Proceedings NTC-92, p. 1107 (1992).
21. "CMOS-Compatible Interconnect with Polymer Integrated Optic Transmitter and Channel", T.E. Van Eck, G.F. Lipscomb, A.J. Ticknor, J.F. Valley, and R. Lytel, Appl. Opt. 31, 6823 (1992).
22. "DCM-Polyimide System For Triple-Stack Poled Polymer Electro-Optic Devices", S. Ermer, J.F. Valley, R. Lytel, G.F. Lipscomb, T.E. Van Eck and D.G. Girton, Appl. Phys. Lett. 61, 2272 (1992).
23. "Photonic Large Scale Integration", G.F. Lipscomb and R. Lytel, Mol. Cryst. Liq. Cryst. Sci. Technol.-Sec. B: Nonlinear Optics Vol. 3, 41 (1992).
24. "Thermoplasticity and Parallel-plate Poling of Electro-optic Polyimide Host Thin Films", J.F. Valley, J.W. Wu, S. Ermer, M. Stiller, E.S. Binkley, J.T. Kenney, G.F. Lipscomb, and R. Lytel, Appl. Phys. Lett. 60, 160 (1992).
25. "Large Scale Integration of Electro-optic Polymer Waveguides", R. Lytel, G.F. Lipscomb, J.T. Kenney, and E.S. Binkley, in Polymers for Lightwave and Integrated Optics: Technology and Applications, L.A. Hornak, editor (Marcel Dekker, New York) 1992, Chapter 16, pp. 433-473.
26. "Materials Requirements for Electro-optic Polymers", R. Lytel and G.F. Lipscomb, in Electrical, Optical, and Magnetic Properties of Organic Solid State Materials, Materials Research Society Proceedings Vol. 247, 17 (1992).

27. "Poled Polyimides for Thermally Stable Electro-optic Materials", J.W. Wu, J.F. Valley, M. Stiller, S. Ermer, E.S. Binkley, J.T. Kenney, G.F. Lipscomb, and R. Lytel, in Electrical, Optical, and Magnetic Properties of Organic Solid State Materials, Materials Research Society Proceedings Vol. 247, 49 (1992).
28. "Multilevel Electro-optic Polymer Waveguide Structures", D.G. Girton, R. Lytel, and G.F. Lipscomb, Conference on Lasers and Electro-optics (CLEO), Technical Digest Vol. 12, paper JFB2 (1992).
29. "Applications of Organic Electro-optic Materials in High-speed Electronic Processors", G.F. Lipscomb, R. Lytel, A.J. Ticknor, J. Kenney, T. Van Eck, D. Girton, and E. Binkley, Materials Research Society Symposium Proceedings Vol. 228, 15 (1992).
30. "Chemical Imidization for Enhanced Thermal Stability of Poled Electro-optic Response in Polyimide Guest-Host Systems", J. Wu, J.F. Valley, S. Ermer, E. Binkley, J. Kenney, and R. Lytel, Appl. Phys. Lett. 59, 2213 (1991).
31. "High Thermally Stable Electro-optic Response in Poled Guest-Host Polyimide Systems Cured at 360° C", J.W. Wu, E.S. Binkley, J.T. Kenney, and R. Lytel, J. Appl. Phys. 69, 7366 (1991).
32. "20 GHz Electro-optic Polymer Mach-Zehnder Modulator", D.G. Girton, S. Kwiatkowski, G.F. Lipscomb, and R. Lytel, Appl. Phys. Lett. 58, 1730 (1991).
33. "A Complementary Optical Tap Fabricated in an Electro-optic Polymer Waveguide", T.E. Van Eck, A.J. Ticknor, R. Lytel, and G.F. Lipscomb, Appl. Phys. Lett. 58, 1558 (1991).
34. "Thermal Stability of Electro-optic Response in Poled Polyimide Systems", J.W. Wu, J.F. Valley, S. Ermer, E.S. Binkley, J.T. Kenney, G.F. Lipscomb, and R. Lytel, Appl. Phys. Lett., 58, 225 (1991).
35. "Optical Railtap Systems for Guided-wave Optical Interconnections", R. Lytel, G.F. Lipscomb, and T.E. Van Eck, Proc. Topical Meeting on Photonic Switching (Optical Society of America, Washington, DC, 1991), Vol. 8, p. 217.
36. "Electro-optic Polymer Waveguide Devices", R. Lytel, G.F. Lipscomb, E.S. Binkley, J.T. Kenney, and A.J. Ticknor, in Materials for Nonlinear Optics: Chemical Perspectives, S.R. Marder, J.E. Sohn, and G.D. Stucky, eds., ACS Symposium Series No. 455 (American Chemical Society, 1991), pp. 103-112.
37. "Application of Electro-optic Polymer Waveguides to Optical Interconnects", G.F. Lipscomb, R. Lytel, A.J. Ticknor, T.E. Van Eck, D.G. Girton, S.E. Ermer, J. Kenney, E. Binkley, and S.L. Kwiatkowski, in Organic Materials for Nonlinear Optics II (OMNO), R.A. Hann and D. Bloor, eds. (Royal Society of Chemistry, Cambridge UK 1991), p. 324.
38. "Nonlinear absorption in a strained InGaAs/GaAs MQW/n-i-p-i structure," T.E. Van Eck, K.P. Aron, G.A. Hansen, R. Lytel, S. Niki, W.S.C. Chang, and H.H. Weider, Nonlinear Optics: Materials, Phenomena, and Devices NLO'90, p. 111 (1990).
39. "Nonlinear Optical Polymers: Challenges and Opportunities in Photonics", A.F. Garito, J. Wu, G.F. Lipscomb, and R. Lytel, Materials Research Society Symposium Proceedings Vol. 173, 467 (1990).
40. "Multifunctional Device Applications of Organic and Polymeric Materials", R. Lytel and G.F. Lipscomb, Materials Research Society Symposium Proceedings Vol. 175, 41 (1990).
41. "Application of the Selective Poling Procedure to the Fabrication of Single-Mode, Waveguide Devices", J.I. Thackara, A.J. Ticknor, G.F. Lipscomb, M.A. Stiller, and R. Lytel, Conference on Lasers and Electro-optics (CLEO), Technical Digest Vol. 11, paper ME5 (1989).
42. "Conjugated Polymers as Third-Order Nonlinear Optical Materials", S. Ermer, K.P. Aron, G.A. Hansen, G.F. Lipscomb, R. Lytel, J.I. Thackara, A.J. Ticknor, and S.I. Yaniger, Proc. 3rd Int'l SAMPE Electronics Conference, Vol. 3, Electronic Processes and Materials, pp. 429-438 (1989).
43. "Nonlinear and Electro-optic Polymer Waveguide Devices", R. Lytel, G.F. Lipscomb, M. Stiller, J. Thackara, and A. Ticknor, Topical Meeting on Integrated and Guided-wave Optics, Technical Digest, p. 126 (1989).
44. "Electro-optic Polymer Waveguide Devices", A.J. Ticknor, J.I. Thackara, M.A. Stiller, G.F. Lipscomb, and R. Lytel, Proc. Topical Meeting on Optical Computing '88, p. 165 (1989).
45. "Advances in Organic Integrated Optical Devices", R. Lytel, G.F. Lipscomb, M. Stiller, J.I. Thackara, and A.J. Ticknor, in Organic Materials for Nonlinear Optics OMNO, R.A. Hann and D. Bloor, eds. (Royal Society of Chemistry, Cambridge UK 1989), p. 382.
46. "Organic Integrated Optical Devices", R. Lytel, G.F. Lipscomb, M. Stiller, J.I. Thackara, and A.J. Ticknor, invited paper, in Nonlinear Optical Effects in Polymers, J. Messier, F. Kajzar, P. Prasad, and D. Ulrich, eds., NATO ASI Series Vol. 162 (1989), p. 227.
47. "Poled Electro-optic Waveguide Formation in Thin-Film Organic Media", J. Thackara, M. Stiller, G.F. Lipscomb, and R. Lytel, Appl. Phys. Lett. 52, 1031 (1988).
48. "Picosecond Nonlinear Optics of Organic Materials", J. Altman, P. Elizondo, G.F. Lipscomb, and R. Lytel, Mol. Cryst. Inc. Nonlin. Opt. Vol. 157, 515 (1988).

49. "Poled Electro-optic Waveguide Devices in Thin-Film Organic Media", J. Thackara, M. Stiller, A.J. Ticknor, G.F. Lipscomb, and R. Lytel, Conference on Lasers and Electro-optics (CLEO) Technical Digest Vol .14, paper TuK4 (1988).
50. "Picosecond Third-order Response of Select Organic Materials", J. Altman, P. Elizondo, G.F. Lipscomb, and R. Lytel, Conference on Lasers and Electro-optics (CLEO), Technical Digest Vol. 14, paper WM37 (1988).
51. "Advance in Organic Electro-optic Devices", R. Lytel, G.F. Lipscomb, and J.I. Thackara, in Nonlinear Optical Properties of Polymers, A.J. Heeger, J. Orenstein, and D.R. Ulrich, ed., Materials Research Society Symposium Proceedings Vol. 109, 19 (1988).
52. "Nonlinear and Electro-optic Organic Devices", R. Lytel and G.F. Lipscomb, in Nonlinear Optical and Electro-active Polymers, P.N. Prasad and D.R. Ulrich, ed., (Plenum Press, MO, 1988), p. 415.
53. "Optoelectronic Waveguide Devices in Thin-Film Organic Media", J. Thackara, M. Stiller, E. Okazaki, G.F. Lipscomb, and R. Lytel, Conference on Lasers and Electro-optics (CLEO), Technical Digest, paper ThK29 (1987).
54. "Research on Nonlinear Optical Materials: An Assessment", Proc. DARPA/AFOSR Workshop on Nonlinear Optical Materials, Annapolis, MD, April, 1986, chapter 6. Proceedings published in Appl. Opt. 26, 211 (1987).
55. "Theory of a Narrow-Band, Electro-optic Tunable Notch Filter", R. Lytel and G.F. Lipscomb, Appl. Opt. 25, 3889 (1986).
56. "Pump-Depletion Effects in Noncollinear Degenerate Four-Wave Mixing in Kerr Media", R. Lytel, J. Opt. Soc. Am. B 3, 1580 (1986).
57. "Theory of Optical Bistability in Collinear Degenerate Four-Wave Mixing", R. Lytel, in Optical Bistability II, C.M. Bowden, H.M. Gibbs, and S.L. McCall, editors (Plenum, New York 1984), pp. 431-438.
58. "Optical Multistability in Collinear Degenerate Four-Wave Mixing", R. Lytel, J. Opt. Soc. Am. B 1, 91 (1984).
59. "Weak Isospin-Breaking and Higher-Order Corrections", R. Lytel, Phys. Rev. D22, 505 (1980).
60. "Do Axions Exist?", T.W. Donnelly, S.J. Freedman, R.S. Lytel, R.D. Peccei, and M. Schwartz, Phys. Rev. D20, 1607 (1978).

CONTRIBUTED PAPERS

1. "Packaging of Single-Mode Polymer Waveguide Devices", R. Lytel, J. Freeman, S. Gutierrez, G. F. Lipscomb, J.I. Thackara, A. J. Ticknor, and N. Zhu, SPIE Symposium on Nonlinear Optics, San Diego, CA (July 1995).
2. "External Modulation using EO Polymer Arrays in Digital Systems", Proc. SPIE OE-LASE 2143, 182 (1994).
3. "Electro-optic Polymer Waveguide Arrays in Digital Systems", Proc. ICONO'1, Val Thorens (January 1994).
4. "Datacom Applications of Electro-optic Polymer Devices", SPIE Symposium 2025, Nonlinear Optical Properties of Organic Materials VI, San Diego, CA (July 13, 1993).
5. "Electro-optic Polymer Materials and Devices: The Fundamental Limits", SPIE OE-LASE '93 Symposium on Nonlinear Optical Properties of Advanced Materials, Los Angeles, CA (January 20, 1993).
6. "Electro-optic Polyimide Materials and Devices for Photonic Large Scale Integration", T.E. Van Eck, D.G. Girton, J.F. Valley, S.P. Ermer, G.F. Lipscomb, R. Lytel, and A.J. Ticknor, Proc. Government Microcircuit and Applications Conference (GOMAC), Las Vegas, NV (November 1992), p. 309.
7. "Organic Electro-Optic Devices for Optical Interconnection", G. F. Lipscomb, R. Lytel, S. P. Ermer, J. Valley, T. Van Eck, D. Girton and A. J. Ticknor, Proc. SPIE 1774 (1992).
8. "Photonic Large Scale Integration", R. Lytel, T.E. Van Eck, G.F. Lipscomb, and A.J. Ticknor, Proc. Government Microcircuit and Applications Conference (GOMAC), Orlando, FL (November 1991), p. 595.
9. "Thermally Stable Electro-optic Polymers", S. Ermer, J. Kenney, J. Wu, J. Valley, R. Lytel, and A.F. Garito, ACS Polymer Preprints 32, 92 (1991).
10. "Organic Electro-optic Devices for Optical Interconnection", G.F. Lipscomb, R. Lytel, A.J. Ticknor, T.E. Van Eck, D.G. Girton, S.P. Ermer, J.T. Kenney, and E.S. Binkley, Proc. SPIE 1560, 388 (1991).
11. "Poled Polyimides as Thermally Stable Electro-optic Polymers", J.W. Wu, J.F. Valley, M.A. Stiller, S.P. Ermer, E.S. Binkley, J.T. Kenney, G.F. Lipscomb, and R. Lytel, Proc. SPIE 1560, 196 (1991).
12. "Applications of Electro-optic Polymers to Optical Interconnects", R. Lytel, Proc. SPIE 1563, 122 (1991).
13. "Electro-optic Polymer Devices for Optical Interconnects", R. Lytel, G.F. Lipscomb, E.S. Binkley, D.G. Girton, J.T. Kenney, A.J. Ticknor, and T.E. Van Eck, Proc. SPIE 1389, 547 (1991).
14. "Electro-optic Polymers for Optical Interconnects", R. Lytel, G.F. Lipscomb, E.S. Binkley, J.T. Kenney, and A.J. Ticknor, Proc. Government Microcircuit and Applications Conference (GOMAC), Las Vegas, NV, p. 471 (1990).
15. "Active Multi-layer Optical Backplanes", A.J. Ticknor, E.S. Binkley, D.G. Girton, J.T. Kenney, D.E. Leslie, G.F. Lipscomb, R. Lytel, J.I. Thackara, and T.E. Van Eck, Proc. SPIE 1319, 590 (1990).

16. "Developments in Polymer Electro-optic Devices at Lockheed", G.F. Lipscomb, R. Lytel, A.J. Ticknor, T.E. Van Eck, S. Kwiatkowski, and D. Girton, Proc. SPIE 1337, 23 (1990).
17. "Electro-optic Polymers for Optical Interconnects", R. Lytel, G.F. Lipscomb, E.S. Binkley, J.T. Kenney, and A.J. Ticknor, Proc. SPIE 1215, 252 (1990).
18. "Application of Polymer Electro-optic Waveguides to Integrated Optics", R. Lytel, Proc. SPIE 1216, 30 (1990).
19. "Nonlinear Optical Polymers for Photo-addressed Spatial Light Modulators", J. Stamatoff, A. Buckley, D. Swanson, L. Gacusan, R. Lytel, and G.F. Lipscomb, Proc. SPIE 1150 (August 1989).
20. "Organic Electro-optic Waveguide Modulators and Switches", R. Lytel, G.F. Lipscomb, J.I. Thackara, and M. Stiller, Proc. SPIE 971, pp. 218-229 (1988).
21. "Advances in Organic Electro-optic Devices", R. Lytel, G.F. Lipscomb, and J.I. Thackara, Proc. SPIE Vol. 824, pp.152-161 (1987).
22. "Optical Nonlinearities in Organic Materials: Fundamentals and Device Applications", R. Lytel, G.F. Lipscomb, P. Elizondo, B. Sullivan, and J. Thackara, Proc. SPIE 682, 125 (1986).