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DATE: Updated November 19, 2009

EDUCATION

University of Pennsylvania	B.A. (Physics with honors)	1979
University of Pennsylvania	M.A.	1981
University of Pennsylvania	Ph.D.	1985

EXPERIENCE

Instructor, Delaware County Community College, Media, PA, Summer 1982
Research Fellow and Instructor, Department of Physics, University of Pennsylvania, 1981-85
Visiting Professor, Dept. of Technology, Tokyo U. of Agriculture and Technology, 10/1 - 10/10/89
Member of Technical Staff, AT&T Bell Laboratories, 1985-90
Assistant Professor, Department of Physics, Washington State University, 1990-95
Assistant Professor of Materials Science, Washington State University, 1991-95
Associate Professor & Tenure, Department of Physics, Washington State University, 1995-2001
Associate Professor & Tenure, Materials Science Program, Washington State University, 1995-2001
Chair, Material Sciences Program, 1997- 2000
Full Professor, Department of Physics Washington State University, 2001-
Full Professor, Materials Science Program, Washington State University, 2001-
Associate Chair of Physics, 2001-2007
Chair of Graduate Studies, 2001-2007
Regents Professor 2009-

PROFESSIONAL SOCIETIES

American Physical Society
Optical Society of America (Fellow)
Materials Research Society
SPIE

PROFESSIONAL RECOGNITION

Pennsylvania Senatorial Scholar, 1976-79
Fellow, Optical Society of America, elected in 1999-
Advisory Board, Marcel Dekker, appointed in 1999-2004
Executive Committee, American Society for Engineering Education, appointed in 1999-
Distinguished Member of National Society of Collegiate Scholars, elected in 2000
Boeing Distinguished Professor 2003-2005
Distinguished Faculty Address, Washington State University 2005.
Visiting Fellow, Katholieke Universiteit Leuven, summer 2006
Visiting Fellow, Katholieke Universiteit Leuven, summer 2009
Regents Professor 2009-

TEACHING AWARDS

Naval Reserve Officer Training Corps Faculty Excellence Award, 1993-94.
Naval Reserve Officer Training Corps Faculty Excellence Award, 1995-96.
Distinguished Member of National Society of Collegiate Scholars, elected in 2000.
Finalist for the Marian E. Smith Faculty Achievement Award 2000-2001

Sampling of Media Coverage

1. Fundamental Limits of Susceptibilities (sampling from over 1000 sources)

- National Geographic (http://news.nationalgeographic.com/news/2004/08/0819_040819_nanointernet.html)
- Wired News (<http://www.wired.com/news/technology/0,1282,64584,00.html>)
- National Post and CanWest News service (Thursday August 12, 2004)
- Laser Focus World (online article)
(http://lfw.pennnet.com/Articles/Article_Display.cfm?Section=OnlineArticles&SubSection=Display&PUBLICATION_ID=12&ARTICLE_ID=210011)
- *Laser Focus World* “NONLINEAR MATERIALS: Optical-switching material breaches quantum gap,” December, 2004 (print article)
- PhysOrg.com (<http://www.physorg.com/news797.html>)
- Physics Daily Online Encyclopedia (http://www.physicsdaily.com/physics/Kuzyk_gap)
- SCI-TECH Today (http://www.sci-tech-today.com/story.xhtml?story_id=27908)
- Nature, *Research Highlights*, Most sensitive molecule, **455**, 236 (18 January 2007).
- Materials World, *Industry and Innovations*, Bumping up a few gears, **15**, 4 (February 2007)
- Chemistry World, *News in Brief*, Tricks of Light **4**, 7 (February 2007).
- Nanotoday, *Research News*, “Bumpy molecules break light-sensitive limit,” **2**, 13 (February 2007)
- Science Base (<http://www.sciencebase.com/science-blog/explosive-electronics.html>)
- Intute (<http://www.intute.ac.uk/sciences/spotlight/>)
- PhysOrg (<http://www.physorg.com/news86966438.html>)
- New Scientist (<http://www.newscientisttech.com/article/dn10882-new-molecules-are-most-lightsensitive-ever.html>)
- EE Times
(<http://www.eetimes.com/showArticle.jhtml;jsessionid=G3WKVMQEPK5WSQSNLPSKHSCJUNN2JVN?articleID=196800660>)
- The Inquirer (<http://www.theinquirer.net/default.aspx?article=36698>)
- DaniWeb (<http://www.daniweb.com/blogs/entry1217.html>)
- Infomatics (<http://www.infomaticsonline.co.uk/vnunet/news/2171898/optical-molecules-boost>)
- The Nanotechnology Group
(<http://www.thenanotechnologygroup.org/index.cfm?Content=88&PressID=2048>)
- CBC News (<http://www.cbc.ca/technology/story/2007/01/03/optics-internet.html>)
- Computing (<http://www.computing.co.uk/vnunet/news/2171898/optical-molecules-boost>)

2. Self-Healing Molecules (sampling from over 300 sources)

- United Press International
(http://www.upi.com/NewsTrack/Science/2007/04/10/study_laser_dye_regenerates_in_darkness/5807/)
- Physics News, *Physicists Find Light-sensitive Molecule Can Heal Itself in the Dark*, Physorg.com
(<http://www.physorg.com/news95408195.html>)
- Nano News Press Releases
(<http://www.thenanotechnologygroup.org/index.cfm?Content=88&PressID=2320>)
- Nano News Press Releases
(<http://www.thenanotechnologygroup.org/index.cfm?Content=88&PressID=2320>)
- Science Base, R&R leads to molecular recovery (<http://www.sciencebase.com/science-blog/rr-leads-to-molecular-recovery.html>)
- Laser Focus World, print version
(http://www.laserfocusworld.com/display_article/294634/12/ARCHI/none/News/TWO-PHOTON-FLUORESCENCE:-Fluorescent-dyes-recover-after-eight-hours-of-res)
- *Real Science*, *Light Sleepers*, (<http://www.realscience.us/2007/04/10/light-sleepers/>).
- Softpedia, *Light-sensitive Molecule Heals Itself in the Dark* (<http://news.softpedia.com/news/Light-sensitive-Molecule-Heals-Itself-in-the-Dark-51499.shtml>)

- Bio Technology, Molecules *Can Repair Themselves if Allowed to 'rest'*
(<http://www.biotechblog.org/entry/molecules-can-repair-themselves-if-allowed-to-rest>)

3. Photomechanical Effect

- *Laser Focus World* "All-optical positioner and stabilizer made from fiber," August, 1994

4. Blue Light Sources

- Electronic Times

REFEREED JOURNAL PUBLICATIONS

1. J. E. Sohn, A. F. Garito, K. N. Desai, R. Narang, M. Kuzyk, "Synthesis of Chiral Diacetylene Polymers," *Makromol. Chem.* **180**, 2975 (1979).
2. M. Kuzyk, R. Norwood, and A. F. Garito, "Dispersion Measurements of the Third-Order Susceptibility of Organic Systems," *J. Opt. Soc. Am. A* **2**, 45 (1985).
3. K. D. Singer, M. G. Kuzyk, and J. E. Sohn, "Nonlinear Optical Processes in Orientationally Ordered Systems: Relationship Between Microscopic and Bulk Susceptibilities," *J. Opt. Soc. Am. B* **4**, 968 (1987). **Invited**
4. J. D. LeGrange, M. G. Kuzyk, and K. D. Singer, "Effects of Order on Nonlinear Optical Processes in Organic Molecular Materials," *Mol. Cryst. Liq. Cryst.* **150b**, 567 (1987). **Invited**
5. K. D. Singer, M. G. Kuzyk, and J. E. Sohn, "Second Harmonic Generation of Orientationally Ordered Materials," *J. Opt. Soc. Am. B* **4**, 78 (1987).
6. M. G. Kuzyk, J. E. Sohn, and A. F. Garito, "A Model for Solid State X-ray Polymerization," *J. Polym. Sci. B, Polym. Phys. Ed.* **26**, 277 (1988).
7. K. D. Singer, M. G. Kuzyk, R. B. Comizzoli, H. E. Katz, M. L. Schilling, J. E. Sohn, and S. J. Lalama, "Electrooptic Phase Modulation and Second Harmonic Generation in Corona-Poled Polymer Films," *Appl. Phys. Lett.* **53**, 1800 (1988).
8. C. W. Dirk and M. G. Kuzyk, "The Missing State Analysis: A Method for Determining the Origin of Molecular Nonlinear Optical Properties," *Phys. Rev. A* **39**, 1219 (1989).
9. M. G. Kuzyk, R. Norwood, J. Wu and A. F. Garito, "Frequency Dependence of the Optical Kerr Effect and Third-Order Electronic Nonlinear-Optical Processes of Organic Liquids," *J. Opt. Soc. Am. B* **6**, 154 (1989); Erratum, *J. Opt. Soc. Am. B* **6**, 1422 (1989).
10. M. G. Kuzyk, K. D. Singer, H. E. Zahn, and L. A. King, "Second Order Nonlinear Optical Tensor Properties of Poled Films Under Stress," *J. Opt. Soc. Am. B* **6**, 742 (1989).
11. M. G. Kuzyk and C. W. Dirk, "Quick and simple Method to Measure Third-Order Nonlinear Optical Properties of Dye-Doped Polymer Films," *Appl. Phys. Lett.* **54**, 1628 (1989).
12. J. E. Sohn, K. D. Singer, M. G. Kuzyk, W. R. Holland, H. E. Katz, C. W. Dirk, and M. L. Schilling, "Materials for Nonlinear Optics—Orientationally Ordered Polymer Films," *Polym. En. Sci.* **29**, 1205 (1989).
13. C. W. Dirk and M. G. Kuzyk, "Damping Corrections and the Calculation of Optical Nonlinearities in Organic Molecules," *Phys. Rev. B* **41**, 1636 (1990).
14. M. G. Kuzyk, R. C. Moore, and L. A. King, "Second-Harmonic-Generation Measurements of the Elastic Constant of a Molecule in Polymer Matrix," *J. Opt. Soc. Am. B* **7**, 64 (1990).
15. C. W. Dirk and M. G. Kuzyk, "Squarylium Dye-Doped Polymer Systems as Quadratic Electrooptic Materials," *Chem. of Materials* **2**, 5 (1990).
16. K. D. Singer, W. R. Holland, M. G. Kuzyk, G. L. Wolk, and P. A. Cahill, "Guest-Host Polymers for Nonlinear Optics," *Mol. Cryst. Liq. Cryst.* **189**, 123 (1990).
17. M. G. Kuzyk, C. W. Dirk, and J. E. Sohn, "Mechanisms of Quadratic Electrooptic Modulation of Dye-Doped Polymer Systems," *J. Opt. Soc. Am. B* **7**, 842 (1990).
18. M. G. Kuzyk and C. W. Dirk, "Effects of Centrosymmetry on the Nonresonant Electronic Third-Order Optical Susceptibility," *Phys. Rev. A* **41**, 5098 (1990).
19. M. C. Gabriel, N. H. Whitaker, Jr., C. W. Dirk, M. G. Kuzyk, and M. Thakur, "Measurement of Ultrafast Optical Nonlinearities using a Modified Sagnac Interferometer," *Optics Letters* **16**, 1334 (1991).
20. M. G. Kuzyk, U. C. Paek, and C. W. Dirk, "Dye-Doped Polymer Fibers for Nonlinear Optics," *Appl. Phys. Lett.* **59**, 902 (1991).
21. C. W. Dirk, L. T. Cheng, and M. G. Kuzyk, "A Simplified Three-Level Model for Describing the Molecular Third-Order Nonlinear-Optical Susceptibility," *Int. J. Quant. Chem.* **43**, 27 (1992). **Invited**

22. M. P. Andrews, M. G. Kuzyk, and F. Ghebremichael, "Local Field Enhancement of the Cubic Optical Nonlinearity in Fractal Silver Nanosphere/Poly (methylmethacrylate) Composites," *Nonlinear Optics* **6**, 103 (1993).
23. C. W. Dirk, N. Caballero, and Mark G. Kuzyk, "The Quadratic Electro-optic Effect in Molecules with Large Optical Hyperpolarizabilities," *Chemistry of Materials* **5**, 733 (1993).
24. F. Ghebremichael, M. G. Kuzyk, and C. W. Dirk, "Optical Second Harmonic Generation Studies of Low Temperature Transitions in Dye-Doped Polymers," *Nonlinear Optics* **6**, 123 (1993).
25. D. A. Cleary, R. D. Willett, F. Ghebremichael, and M.G. Kuzyk, "Temperature Dependent Second Harmonic Generation in Tin Phosphorus Sulfides," *Solid State Communications* **88**, 39 (1993).
26. C. Poga, M. G. Kuzyk, and C. W. Dirk, "Quadratic Electroabsorption Studies of Third-Order Susceptibility Mechanisms in Dye-Doped Polymers," *J. Opt. Soc. Am. B* **11**, 80 (1994).
27. K. Zimmerman, F. Ghebremichael, M. G. Kuzyk, and C. W. Dirk, "Electric-Field-Induced Polarization Current Studies in Guest-Host Polymers," *J. Appl. Phys.* **75**, 1267 (1994).
28. R. A. Norwood, M. G. Kuzyk, R. A. Keosian, "Electro-optic Tensor Ratio Determination of Side-Chain Copolymers with Electro-optic Interferometry," *J. Appl. Phys.* **75**, 1869 (1994).
29. D. J. Welker and M. G. Kuzyk, "Photomechanical Stabilization in a Polymer Fiber-Based All-Optical Circuit," *Appl. Phys. Lett.* **64**, 809 (1994).
30. M. G. Kuzyk, D. J. Welker, and S. Zhou, "Photomechanical Effects in Polymer Optical Fibers," *Nonlinear Optics* **10**, 409 (1995).
31. C. W. Dirk, S. Devanathan, M. Velez, F. Ghebremichael, and M. G. Kuzyk, "Second Harmonic Generation Measurements of the Reorientational Elastic Response of a Dye Molecule in a Random Co-Polymer of Styrene and Methyl Methacrylate," *Macromolecules* **27**, 6167 (1994).
32. C. Poga, T. M. Brown, M. G. Kuzyk, and C. W. Dirk, "Characterization of the Excited States of a Squaraine Molecule with Quadratic Electroabsorption Spectroscopy," *J. Opt. Soc. Am. B* **12**, 531 (1995).
33. F. Ghebremichael, C. Poga, and M. G. Kuzyk, "Optical Second Harmonic of Conductor Interfaces," *Appl. Phys. Lett.* **66**, 139 (1995).
34. F. Ghebremichael and M. G. Kuzyk, "Optical Second Harmonic Generation as a Probe of the Temperature Dependence of the Distribution of Sites in a Poly (methyl methacrylate) Polymer Doped with Disperse Red 1 Azo Dye," *J. Appl. Phys.* **77**, 2896 (1995).
35. D. J. Welker and M. G. Kuzyk, "Optical and Mechanical Multistability in a Dye-Doped Polymer Fiber Fabry-Perot Waveguide," *Applied Phys. Lett.* **66**, 2792 (1995).
36. D. W. Garvey, Q. Li, M. G. Kuzyk, and C. W. Dirk, "Sagnac Interferometric Intensity Dependent Refractive Index Measurements of Polymer Optical Fiber," *Optics Letters* **21**, 104 (1996).
37. D. J. Welker and M. G. Kuzyk, "All-optical Devices in Polymer Optical Fiber," *Nonlinear Optics* **15**, 435 (1996).
38. D. W. Garvey, M. G. Kuzyk, C. W. Dirk, S. Martinez, H. Selnau Jr., P. Craig, and L. Green, "Progress Towards Making an All-optical Switch in Polymer Optical Fibers," *Nonlinear Optics* **15**, 455 (1996).
39. D. W. Garvey, K. Zimmerman, P. Young, J. Tostenrude, J. S. Townsend, M. Lobel, M. Dayton, R. Wittorf, M. G. Kuzyk, J. Sunick, and C. W. Dirk, "Single-mode Nonlinear-Optical Polymer Fibers," *J. Opt. Soc. Am. B* **13**, 2017 (1996).
40. D. S. Welker and M. G. Kuzyk, "All-Optical Switching in a Dye-Doped Polymer Fiber Fabry-Perot Waveguide," *Applied Phys. Lett.* **69**, 1835 (1996).
41. D. J. Welker and M. G. Kuzyk, "Suppressing vibrations in a sheet with a Fabry-Perot photomechanical device," *Oppt. Lett.* **22**, 417 (1997).
42. F. Ghebremichael, M. G. Kuzyk and H. Lackritz, "Nonlinear Optics and Polymer Physics," *Polymer Reviews* **22**, 1147 (1997).
43. Z. Zhou, S. Vigil, B. Canfield, J. Tostenrude, and M. G. Kuzyk, "Dual-core single-mode nonlinear fiber coupler," *JOSA B* **15**, 895 (1998).
44. K. Mathis, M. G. Kuzyk, and C. W. Dirk, "The mechanisms of the nonlinear optical properties of squaraine dyes in PMMA polymer," *JOSA B* **15**, 871 (1998).
45. F. Ghebremichael, M. G. Kuzyk, K. D. Singer & J. Andrews, "Relationship Between the Second-Order Microscopic and Macroscopic Nonlinear Optical Susceptibilities of Poled Dye-Doped Polymers," *J. Opt. Soc. Am. B.* **15**, 2294 (1998).
46. D. J. Welker, J. Tostenrude, D. W. Garvey, B. K. Canfield & M. G. Kuzyk, "Fabrication and characterization of single-mode electro-optic polymer optical fiber," *Optics Letters* **23**, 1826 (1998).

47. R. Kruhlak and M. G. Kuzyk, "Side Illumination Fluorescence (SIF) Spectroscopy I: Principles," **16**, 1749 (1999).
48. R. Kruhlak and M. G. Kuzyk, "Side Illumination Fluorescence (SIF) Spectroscopy II: Applications to Squaraine dye-doped polymer optical fibers," **16**, 1756 (1999).
49. M. G. Kuzyk, D. W. Garvey, B. K. Canfield, S. R. Vigil, D. J. Welker, J. Tostenrude, and C. Breckon, "Characterization of single-mode polymer optical fiber and electrooptic fiber devices," *Chemical Physics*, **245**, 327 (1999).
50. M. G. Kuzyk, D. W. Garvey, S. R. Vigil, D. J. Welker, "All-optical devices in polymer optical fiber," *Chemical Physics*, **245**, 533 (1999).
51. D. Sullivan, L. Liu, and M. G. Kuzyk, "Three-Dimensional Optical Pulse Simulation Using the FDTD Methods," *IEEE Transactions on Microwave Theory and Techniques*, **48**, 1127 (2000).
52. M. G. Kuzyk, "Fundamental limits on third-order molecular susceptibilities," *Optics Letters* **25**, 1183 (2000).
53. M. G. Kuzyk, "Physical Limits on Electronic Nonlinear Molecular Susceptibilities," *Physical Review Letters* **85**, 1218 (2000).
54. S. R. Vigil and M. G. Kuzyk, "Absolute molecular optical Kerr-effect spectroscopy of dilute organic solutions and neat organic liquids," *J. Opt. Soc. Am B* **18**, 679 (2001).
55. M. G. Kuzyk, "Quantum Limits of the Hyper-Rayleigh Scattering Susceptibilities," *IEEE Journal on Selected Topics in Quantum Electronics* **7**, 774 (2001). Invited
56. B. K. Canfield, C. S. Kwiatkowski, and M. G. Kuzyk, "Direct Deflection Method For Determining Refractive Index Profiles of Polymer Optical Fiber Preforms," *Applied Optics* **41**, 3404-3411 (2002).
57. M. A. Diaz-Garcia, S. Fernandez De Avila, and M. G. Kuzyk, "Dye-Doped Polymers for Blue Organic Diode Lasers," *Applied Physics Letters* **80**, 4486-4488 (2002).
58. C. Jiang, M. G. Kuzyk, J.-L. Ding, W. E. John, and D. J. Welker, "Fabrication and Mechanical Behavior of Dye-Doped Polymer Optical Fiber," *Journal of Applied Physics* **92**, 4-12 (2002).
59. B. Howell and M. G. Kuzyk, "Amplified Spontaneous Emission and Recoverable Photodegradation in Disperse-Orange-11-Doped-Polymer," *Journal of the Optical Society of America B* **19** (8), 1790 (2002).
60. W. Zhang, S. Bian, S. I. Kim, and M. G. Kuzyk, "High Efficiency Volume Gratings in DR1-doped poly (methyl methacrylate)" –*Optics Letters* **27** (13) 1105 (2002).
61. M. G. Kuzyk, "Using Berry's Phase for Position Sensitive Acoustical and Stress Detection," *J. Opt. Soc. Am. B* **19**, 2346 (2002).
62. S. Bian and M. G. Kuzyk, "Real-Time Holographic Reflection Gratings in Volume Media of Azo-Dye-Doped poly(methyl methacrylate)," *Optics Letters* **27**, 1761 (2002).
63. S. Bian, W. Y. Zhan, S. I. Kim, N. B. Embaye, G. J. Hanna, J. J. Park, B. K. Canfield, M. G. Kuzyk, "High-efficiency optical phase conjugation by degenerate four-wave mixing in volume media of disperse red 1-doped poly(methyl methacrylate)," *Journal of Applied Physics* **92**, (8), 4186-4193 (2002).
64. M. A. Diaz-Garcia, S. Fernandez De Avila, and M. G. Kuzyk, "Energy Transfer from Organics to Rare-Earth Complexes," *Applied Physics Letters* **81**, 3924-3926 (2002).
65. I. Vargas-Baca, A. P. Brown, M. P. Andrews, T. Galstian, Y. Li, H. Vali, and M. G. Kuzyk, "Linear and Nonlinear Optical Responses of a Dye Anchored to Gold Nanoparticles Dispersed in Liquid and Polymeric Matrixes," *Can. J. Chem.* **80**, 1625-1633 (2002).
66. Mark G. Kuzyk, "Fundamental limits on third-order molecular susceptibilities: erratum," *Optics Letters* **28**, 135 (2003).
67. M. G. Kuzyk, "Erratum: Physical Limits on Electronic Nonlinear Molecular Susceptibilities," *Physical Review Letters* **90**, 039902 (2003).
68. Shaoping Bian, Weiya Zhang and Mark G. Kuzyk, "Erasable holographic recording in photosensitive polymer optical fibers," *Optics Letters* **28**, 929 (2003).
69. M. G. Kuzyk, "Fundamental Material Limitations on Optical Devices," *Circuits and Devices* **19** (5), 8 (2003).
70. M. G. Kuzyk "Fundamental limits on two-photon absorption cross-sections," *Journal of Chemical Physics* **119**, 8327 (2003).
71. M. G. Kuzyk, "Fundamental Limits of Nonlinear Susceptibilities," *Optics and Photonic News*, December, page 26 (2003). (Special issue "Optics in 2003") summarizes 29 of "the most exciting research to emerge in the last 12 months ...of cutting edge research."
72. Paul R. Hoffman and Mark G. Kuzyk, "Position Determination of an Acoustic Burst Along a Sagnac Interferometer," *J. Lightwave Tech.* **22**, 494 (2004).

73. S. Bian and Mark G. Kuzyk, "Phase conjugation by low-power continuous-wave degenerate four-wave mixing in nonlinear polymer optical fibers," *Appl. Phys. Lett.* **84**, 858-860 (2004).
74. Mark G. Kuzyk, "Doubly Resonant Two-Photon Absorption Cross-Sections: It doesn't get any bigger than this," *Journal of Nonlinear Optical Physics and Materials* **13**, 461 (2004).
75. S. Bian and Mark G. Kuzyk, "Dark Spatial Solitons in Bulk Azo-Dye-Doped Polymer Using Photoinduced Molecular Reorientation," *Appl. Phys. Lett.* **85**, 1104-1106 (2004).
76. Kakoli Tripathy, Javier Perez Moreno, Mark G. Kuzyk, Benjamin J. Coe, Koen Clays, and Anne Myers Kelley, "Why Hyperpolarizabilities Fall Short of the Fundamental Quantum Limits," *J. Chem. Phys.* **121**, 7932 (2004).
77. B. F. Howell and M. G. Kuzyk, "Lasing Action and Photodegradation of Disperse Orange 11 Dye in Liquid Solution," *Appl. Phys. Lett.* **85**, 1901 (2004).
78. M. A. Diaz-Garcia, E. M. Calzado, J. M. Villalvilla, P G. Boj, J. A. Quintana, and M. G. Kuzyk, "TPD-Based Blue Organic Lasers," *Journal of Nonlinear Optical Physics and Materials* **13**, 621 (2004).
79. B. K. Canfield and M. G. Kuzyk "Using quadratic electroabsorption to measure the hyperpolarizability, β , of asymmetric molecules," *J. Opt. Soc. Am. B* **22**, 723 (2005).
80. R. J. Kruhlak and M. G. Kuzyk "Measuring the electronic third-order susceptibility of the silicon-phthalocyanine-monomethacrylate molecule with quadratic electroabsorption spectroscopy," *J. Opt. Soc. Am. B* **22**, 643 (2005).
81. M. G. Kuzyk, Reply to comment on "Physical Limits on Electronic Nonlinear Molecular Susceptibilities," *Physical Review Letters* **95**, 109402 (2005).
82. Javier Pérez Moreno and M. G. kuzyk, "Fundamental Limits of the Dispersion of the Two-Photon Absorption Cross-Section," *J. Chem. Phys.* **123**, 194101 (2005).
83. Mark G. Kuzyk, "Compact sum-over-states expression without dipolar terms for calculating nonlinear susceptibilities," *Phys. Rev. A* **72**, 053819 (2005).
84. Shaoping Bian, Dirk Robinson, and Mark G. Kuzyk, "An optically activated cantilever using photomechanical effects in dye-doped polymer fibers," *J. Opt. Soc. Am. B.* **23**, 697-708 (2006).
85. Mark G. Kuzyk, "Truncated Sum Rules and their use in Calculating Fundamental Limits of Nonlinear Susceptibilities," *Journal of Nonlinear Optical Physics and Materials* **15**, 77-87 (2006).
86. Mark G. kuzyk and David S. Watkins, "The effects of geometry on the hyperpolarizability," *J. Chem. Phys.* **124**, 244104 (2006).
87. Juefei Zhou , Mark G. Kuzyk, and David S. Watkins, "Pushing the hyperpolarizability to the limit," *Optics Letters* **31**, 2891 (2006).
88. Kakoli Tripathy, Javier Perez-Moreno, Mark G. Kuzyk, Benjamin J. Coe, Koen Clays, and Anne Myers Kelley, "Erratum: Why Hyperpolarizabilities Fall Short of the Fundamental Quantum Limits," *J. Chem. Phys.* **125**, 079905 (2006).
89. Mark G. Kuzyk, "Fundamental limits of all nonlinear-optical phenomena that are representable by a second-order susceptibility," *J. Chem. Phys.* **125**, 154108. (2006).
90. Weiya Zhang and Mark G. Kuzyk, "Effect of a thin optical Kerr medium on a Laguerre-Gaussian beam," *Appl. Phys. Lett.* **89**, 101103 (2006).
91. Javier Perez-Moreno, Yuxia Zhao, Koen Clays, and Mark Kuzyk, "Modulated conjugation as a means for attaining a record high intrinsic hyperpolarizability," *Opt. Lett.* **32**, 59 (2007).
92. Ye Zhu, Juefei Zhou, and Mark G. Kuzyk, "Two-photon fluorescence measurements of reversible photodegradation in a dye-doped polymer," *Opt. Lett.* **32**, 958-960 (2007).
93. Javier Pérez-Moreno, Inge Asselberghs, Yuxia Zhao, Kai Song, Hachiro Nakanishi, Shuji Okada, Kyoko Nogi, Oh-Kil Kim, Jongtae Je, Janka Mátrai, Marc De Maeyer, and Mark G. Kuzyk "Combined molecular and supramolecular bottom-up nano-engineering for enhanced nonlinear optical response: Experiments, modelling and approaching the fundamental limit," *J. Chem. Phys.* **126**, 074705 (2007).
94. Mark G. Kuzyk, "New molecules may revolutionize the performance of optical devices," *SPIE Newsroom* (2007).
95. Juefei Zhou, Mark G. Kuzyk, and David S. Watkins, "Reply to 'Comment on pushing the hyperpolarizability to the limit'," *Opt. Lett.* **32**, 944 (2007).
96. Ye Zhu, Juefei Zhou, and Mark G. Kuzyk, "Self-Healing and Laser Hardening of Nonlinear-Optical Materials," *Optics and Photonics News* **18**, 31 (2007). (Special issue "Optics in 2007") summarizes "the most exciting research to emerge in the last 12 months ...of cutting edge research."

97. W. Zhang and M. G. Kuzyk, "Optical limiting using Laguerre-Gaussian beams," *Appl. Phys. Lett.* **91**, 201110 (2007).
98. Mark C. Kuzyk and Mark G. kuzyk, "Monte Carlo Studies of the Fundamental Limits of the Intrinsic Hyperpolarizability," *J. Opt. Soc. Am B* **25**, 103 (2008).
99. Juefei Zhou, Urszula B. Szafruga, David S. Watkins, and Mark G. Kuzyk. "Optimizing potential energy functions for maximal intrinsic hyperpolarizability," *Phys. Rev. A* **76**, 053831 (2007).
100. Javier Pérez-Moreno, Koen Clays, and Mark G. Kuzyk, "A new dipole-free sum-over-states expression for the second hyperpolarizability," *J. Chem. Phys.* **128**, 084109 (2008).
101. Juefei Zhou and Mark G. Kuzyk, "Intrinsic Hyperpolarizabilities as a Figure of Merit for Electro-optic Molecules," *J. Phys. Chem. C* **112**, 7978 (2008) **invited**.
102. Natnael B. Embaye, Shiva K. Ramini, and Mark G. Kuzyk, "Mechanisms of reversible photodegradation in disperse orange 11 dye doped in PMMA polymer," *J. Chem. Phys.* **129**, 054504 (2008).
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28. F. Ghebremichael, M. G. Kuzyk, and C. W. Dirk, "Low-Temperature Second Harmonic Generation Studies of Dye-Doped Polymers," APS March Meeting, Seattle (1993).
29. C. Poga, M. G. Kuzyk, and C. W. Dirk, "Molecular Reorientational Effects in Polymers," APS March Meeting, Seattle (1993).
30. F. Ghebremichael, M. G. Kuzyk, C. W. Dirk, "Second Harmonic Generation Studies of Low Temperature Transitions in Dye-Doped Polymers," CLEO/QELS, Baltimore (1993).
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35. S. Zhou and M. G. Kuzyk, "Observation of Fast Photomechanical Effects in a Polymer Optical Fiber," International Conference on Intelligent Materials, Williamsburg, **1375** (1994).
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39. S. Zhou and M. G. Kuzyk, "Fast Electrostrictive Mechanisms in Polymer Optical Fiber," SPIE Symposium on Optical Properties of Organic Materials VII, **2285**, 125, San Diego (1994).
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86. Mark G. Kuzyk, "Microscopic nonlinear susceptibilities: the sky is not the limit," Proc. SPIE **5212**, (2002).
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88. Mark G. Kuzyk, "Using Sum Rules to Investigate the Character of Nonlinear Susceptibilities," LEOS 2005 Annual Meeting, , Sydney, Australia (2005).
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90. David J. Pikas, Mark A. Walker, Christopher D. Brewer, Bala Sankaran, Loon-Seng Tan, Mark G. Kuzyk, Sean M. Kirkpatrick, Peter E. Powers, "Background host effects on the nonlinear photophysical properties of a two-photon absorbing dye," Proc. SPIE **5989**, 199-208 (2005).
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93. Mark G. Kuzyk, "An all-optical polymer fiber cantilever," SPIE **6331**, 63310T (2006).
94. Mark G. Kuzyk, "Quantum calculations of the dispersion of the fundamental limits of nonlinear susceptibilities," SPIE **6331**, 633103 (2006).
95. Mark G. Kuzyk and David S. Watkins, "Using the relationship between geometry and hyperpolarizability as a tool for developing new paradigms for molecular engineering," SPIE **6331**, 633113 (2006).

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98. Juefei Zhou, Urszula B. Szafruga, Javier Pérez-Moreno, Koen Clays, David S. Watkins, Yuxia Zhao, and Mark G. Kuzyk, "Using numerical optimization techniques to design molecules with record intrinsic hyperpolarizability," Nonlinear Optics: Materials, Fundamentals and Applications Topical Meeting and Tabletop Exhibit, Kona Hawaii (2007).
99. Ye Zhu, Juefei Zhou, Natnael Embaye, and Mark G. Kuzyk, "Self-healing of polymer lasers and two-photon absorbers," LEOS Summer Topical Meetings on Organic Nonlinear Optics, July 23-35, Portland (2007).
100. Mark G. Kuzyk, Natnael Embaye, Shiva K. Ramini, Ye Zhu, and Juefei Zhou, "The Physics of Self-Healing After Photodegradation in a Dye-Doped Polymer," SPIE (2008).
101. Mark C. Kuzyk and Mark G. Kuzyk, "Testing Theories of Fundamental Limits of Nonlinear Susceptibilities with Monte Carlo Studies," ICONO 10, Santa Fe, NM (2008).
102. Javier Pérez-Moreno; Koen Clays; Mark G. Kuzyk, "Sum-rules and quantum limits: nonlinear optics from first principles," Proc. SPIE **6999**, 22 (2008).
103. Javier Pérez-Moreno, Koen J. Clays, and Mark G. Kuzyk, "Role of the conjugated spacer in the optimization of second-order nonlinear chromophores," Proc. SPIE **6413** (2009).
104. Javier Pérez-Moreno, Koen J. Clays, and Mark G. Kuzyk, "Sum-Rules: Applications to Nonlinear Optics at the Molecular Level," Advances in Optical Sciences: OSA Optics & Photonics Congress, Honolulu, Hawaii (2009).
105. Javier Pérez-Moreno, Mark G. Kuzyk, and Koen J. Clays, "Towards a unifying theory for the first-, second- and third-order molecular (non)linear optical response," SPIE Photonics Europe Meeting, (2010).

COLLOQUIA

- 9/88 Lockheed, Palo Alto, CA.
1/89 Temple University, Dept. of Physics, Philadelphia, PA.
4/89 Sandia National Laboratories, Albuquerque, NM.
10/89 Hitachi, Iburaki, Japan.
10/89 Fijitsu, Atsugi, Japan.
10/89 NTT, Iburaki, Japan.
10/89 Tokyo University of Agr. and Tech., Tokyo, Japan.
10/89 Riken Institute of Physical Sciences, Tokyo, Japan.
1/90 Purdue University, Department of Physics, Calumet, IN.
2/90 Case Western Reserve Univ., Dept. of Physics, Cleveland, OH.
2/90 California State Univ., Dept. of Physics, Long Beach, CA.
2/90 Washington State Univ., Dept. of Physics, Pullman, WA.
2/90 University of Florida, Dept. of Physics, Gainesville, FL.
2/90 Clark University, Dept. of Physics, Worcester, MA.
2/90 Univ. of Central Florida, Dept. of Physics, Orlando, FL.
3/90 Swarthmore College, Dept. of Physics, Swarthmore, PA.
3/90 Texas Christian University, Dept. of Physics, Fort Worth, TX.
3/90 Hoechst-Celanese, Summit, NJ.
1/91 Hercules Research Laboratories, Wilmington, DE.
1/91 University of Idaho, Department of Physics, Moscow, ID.
7/91 California Institute of Technology, Pasadena, CA.
6/92 Tokyo University of Agriculture and Technology, Tokyo, Japan.
6/92 Hitachi, Iburaki, Japan.
6/92 Hoechst-Japan, Tokyo, Japan.
10/93 Allied Signal, Summit, NJ.
1/94 CNET (French Telecom Laboratories) Bagneux, France.
1/94 Institut D'optique Théorique et Appliquée, Orsay, France.
1/94 CEA, DEIN/SPE, CE Saclay, France.
2/94 CREOL, Orlando, FL.

4/94 University of Nebraska, Lincoln, NE.
10/95 Washington State Univ., Dept. of Physics, Pullman, WA.
6/96 Allied Signal, Summit, NJ.
10/98 Dept. of Physics, Trinity College, Univ. of Dublin
10/98 Kwangju Inst. of Science & Technology
11/99 Case Western Reserve Univ., Dept. of Physics, Cleveland, OH
11/00 Wright Patterson Air Force Base, Dayton, OH
02/01 Walla Walla College, WA, Physics and Engineering
03/01 Montana State University, Dept. of Physics and Dept. of Chemistry, Bozeman, MT
4/01 Washington State Univ., Dept. of Chemistry, Pullman, WA.
10/01 Washington State Univ., Dept. of Physics, Pullman, WA.
11/15/04 University of Idaho, Department of Physics, Moscow, Id.
6/22/06 University of Leuven, Department of Chemistry, Leuven, Belgium
7/27/07 Wright Patterson Air Force Labs, Dayton, OH
9/20/07 Lehigh University, Department of Physics, Bethlehem, PA
10/13/08 Oregon State University, Department of Physics, Corvallis, OR
6/16/09 University of Leuven, INPAC Lectures on Trends in Nanosciences, Leuven, Belgium
6/14/09 Case Western Reserve University, Department of Physics, Cleveland, OH
6/15/09 Kent state University, Department of Physics, Kent, OH

PROFESSIONAL SERVICE

Washington State

Washington Technology Center Photonics Advisory Committee Meeting, 2000-

Educational

Science by Mail Program, Boston Science Museum, 1991-94.

Demonstrations: Reached over 2,000 high school and elementary school students, 1977-1993.

NSF Young Scholars Program—Faculty Mentor, 1991.

Science Fair Judge: Franklin Elementary, Jefferson Elementary, 1992, 1993, 1994.

Lincoln Middle School Mentor Program, 1993-94.

Dr. Universe Advisory Board, 2001-

Short Courses

"Polymers as Nonlinear Optical Materials," APS March Meeting, Seattle (1993).

"Nonlinear Optics – from molecules to useful materials," Molecular Nano- and Bio-photonics Summer School, Erasmus Mundus Master Course, Porquerolles, France (June 19-27, 2008).

Conference Organization

Conference Organizer:

- "Progress in Nonlinear Optics: Organic and Polymeric Materials," Pullman, Summer (1992).
1. "International Conference on Organic Nonlinear Optics I," Val Thorens, France (January 1994).
 2. "Fourth IKETANI Conference: The International Conference on Optically Nonlinear Organic Materials and Applications," Hawaii (May 1994).
 3. "International Conference on Organic Nonlinear Optics II," Japan (1995).
 4. "International Conference on Organic Nonlinear Optics III," Florida (1996).
 5. Conference Chair, Symposium on Organic Nonlinear Optics, SPIE, "ICONO IV," Japan (1998).
 6. "International Conference on Organic Nonlinear Optics, IV," Japan (1998).
 7. "International Conference on Organic Nonlinear Optics, V," Switzerland (2000).
 8. Conference Co-Chair, Symposium on Linear Optical Properties of Waveguides and Fibers Denver (1999)
 9. "International Conference on Organic Nonlinear Optics, VI," Tuscon, AZ (2001).

10. "International Conference on Organic Nonlinear Optics, VII," Mt. Sorak, Korea (2003).
11. "International Conference on Organic Nonlinear Optics, VIII," Japan (2005).
12. "International Conference on Organic Nonlinear Optics, IX," Brugge, Belgium (2006).
13. "International Conference on Organic Nonlinear Optics, X," Santa Fe, NM (2008).
14. "International Conference on Organic Nonlinear Optics, XI," Beijing, China (2009).
- 15.

Conference Co-Chair, Symposium on Organic Nonlinear Optics: SPIE

San Diego (1992)
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Seattle (2002)
San Diego (2003)
Denver(2004)
San Diego (2005)
San Diego (2006)

Conference Co-Chair, Symposium Symposium on Linear Optical Properties of Waveguides and Fibers: SPIE

Denver (1999)
San Diego (2000)

Conference Co-Chair, Symposium on Nonlinear Optics: SPIE, Opto-Northwest

Seattle (1999)

Session Chair:

Materials Research Society Fall Meeting, Boston (1990)
SPIE, San Diego (1992)
Progress in NLO (1992)
SPIE, San Diego (1993)
ICONO'1, Val Thorens, France (1994)
IKATANI, Hawaii (1994)
ICONO'2, Val Thorens, France (1994)
OSA Annual Meeting, Portland, OR (1995)
ICONO'3, Marco Island, FL (1996)
OSA Annual Meeting, Orlando, FL (1997)
Moderator, Washington Technology Center Workshop on New Technologies, Seattle (2000)
ICONO'5, Davos, Switzerland (2000)
14th Annual IEEE Lasers and Electro-Optics Society 2001 Annual Meeting, in San Diego, CA (2001)
APS NW Meeting, Moscow, ID (2004).
SPIE San Diego (2006).
ICONO'9, Brugge, Belgium (2006).
SPIE San Diego Linear and Nonlinear Optics of Organic Materials VIII (2008)
SPIE San Diego Nano- and Macro- Photonics for Space Environments II (2008)
SPIE San Diego Nano- and Macro- Photonics for Space Environments III (2009)

Program Committee:

ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Washington, D.C. (8/94).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Portland, OR (9/95).

ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Orlando, FL (8/96).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Long Beach, CA (9/97).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Boston, MA (9/98).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Santa Clara, CA (9/99).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, Washington, D.C. (8/00).
ACS/OSA joint meeting on Polymeric Thin Films for Nonlinear Optics, (8/01).
Conference on Molecular Optics and Electronics, Alicante, Spain (2003).
IEEE-LEOS annual meeting, Puerto Rico (2004).
IEEE-LEOS annual meeting, Sydney, Australia (2005).
IEEE-LEOS annual meeting, (2006).
SPIE San Diego (2006).
ICCOOPMA Darwin, Australia (2006)
SPIE San Diego, Organic NLO (2007)
ICCOOPMA London, England (2007)
SPIE San Diego (2007)
ICCOOPMA Edmonton, Alberta, Canada (2008)
SPIE San Diego, Linear and Nonlinear Optics of Organic Materials VIII (2008)
SPIE San Diego Nano-and Macrophotonics for Space Environments II Conference (2008)
SPIE San Diego, Linear and Nonlinear Optics of Organic Materials IX (2009)
SPIE San Diego Nano-and Macrophotonics for Space Environments III Conference (2009)

Editor

Topical Editor of *Journal of the Optical Society of America B* (1996-2001).
Special issue of *Nonlinear Optics* **6** (1993).
Special issue of *Journal of the Optical Society of America B* (1997).
Advisory Committee, Marcel Dekker (1998-)
Journal of Nonlinear Optical Physics and Materials, Member of Editorial Board 2004-

Referee

Reviewer for: Physical Review/Physical Review Letters; Journal of the Optical Society of America B, Optical Physics; Optics Letters; Macromolecules; Material Research Society; Nature; ACS Symposium Series; Chemical Review, Journal of Physical Chemistry; Journal of the American Chemical Society; SPIE Proceedings; Applied Physics Letters; Journal of Applied Physics; Nonlinear Optics; Chemistry of Materials; Air Force Office of Scientific Research; Journal of Polymer Science; National Research Council, Commission on Physical Sciences, Mathematics and Resources; Petroleum Research Fund; National Science Foundation; Army Research Office; Marcel Dekker; Solid State Communications; Photonics Technology Letters; Journal of Lightwave Technology; Hong Kong Science Foundation; Optics Communications, Institute of Physics, Research Corporation, Freeman Publishers.

Panel

NSF Panel (SBIR, 9/30/92, Washington, D.C.)
NSF Panel (SBIR, 9/29/93, Washington, D.C.)
NSF Panel (Engineering Research Centers, 6/12 - 6/13, 1997, Arlington, VA)
NSF Panel (Foundations Program, 6/5-6/6, 1998, Arlington, VA)
NSF Panel (MRI Equipment, 6/5-6/6, 1999, Arlington, VA)
NSF Panel (EECS Directorate, 6/5-6/6, 2000, Arlington, VA)
WTC Panel on Photonics (11/14/00, Seattle)
NSF Panel(EECS Directorate, 6/12-6/13, 2004, Arlington, VA)

Other

External Honors Examiner, Swarthmore College, Swarthmore, PA (1990).
External Examiner, Wong Siu Wing, M.S. Thesis, The Chinese University of Hong Kong (1996).
Consultant: Hoechst-Celanese Corporation, 1991-93.

Consultant: SEL Laboratories, 1999-

Consultant: EPRI Inc., 1999-

Hosted AT&T Bell Labs Representative for Women and Minority Program (1991).

Hosted AT&T Bell Labs Representative for Women and Minority Program (1992).

Teaching Experience

Classes taught: Calculus and Non-calculus based Introductory Physics sequence; Modern Physics; Thermodynamics;
Junior E&M I and II; Optoelectronics Labs I and II; Nonlinear Optics; Graduate Quantum Mechanics I and II

Graduate Students Mentored

Graduated 21 Masters Students and 13 PhDs.

Continuous Funding History

About \$4 Million at WSU. Agencies include: AFOSR, Allied Signal, ARO, Boston Optical Fiber, EPRI, Hoechst-Celanese, NSF, Petroleum Research Fund, Wright Patterson Air Force Labs, Spectralux and WTC.