

2007 Publications and Patents

1. Fuchs, D. J. & Weiss, P. S. (2007). Insertion of 1,10-decanedithiol in decanethiolate self-assembled monolayers on Au{111}. *Nanotechnology*, 18, 044021/1-044021/7 (2007).
2. Mullen, T. J., Dameron, A. A., Andrews, A. M., & Weiss, P. S. (2007). Selecting and driving nanoscale assembly in monolayer films through tailored intermolecular interactions. *Aldrichimica Acta*, 40, 21-23.
3. Mullen, T. J., Srinivasan, C., Hohman, J. N., Gillmor, S. D., Shuster, M. J., Horn, M. W., Andrews, A. M., & Weiss, P. S. (2007). Microcontact insertion printing. *Applied Physics Letters*, 90, 063114/1-063114/3. Also appeared in the *Virtual Journal of Nanoscale Science and Technology*.
4. Hatzor de Picciotto, A., Wissner-Gross, A. D., Lavalley, G., & Weiss, P. S. (2007). Arrays of Cu²⁺-complexed organic clusters grown on gold nano dots. *Journal of Experimental Nanoscience*, 2, 3-7.
5. Srinivasan, C., Hohman, J. N., Anderson, M. E., Zhang, P. P., Weiss, P. S., & Horn, M. W. (2007). Molecular-ruler nanolithography. *Proceedings of the SPIE*, 6517, 65171I, 1-9.
6. Daniel, T. A., Uppilli, S., McCarty, G., & Allara, D. L. (2007). Effects of molecular structure and interfacial ligation on the precision of Cu-bound, omega-mercaptoalkanoic acid 'molecular ruler' stacks. *Langmuir*, 23, 636-648.
7. McGuinness, C. L., Shaporenko, A., Zharnikov, M., Walker, A. V., & Allara, D. L. (2007). Molecular self-assembly at bare semiconductor surfaces: Investigation of the chemical and electronic properties of the alkanethiolate-GaAs(001) interface. *Journal of Physical Chemistry C*, 111, 4226-4234.
8. Dixon, M. C., Daniel, T. A., Heida, M., Smilgies, D. M., Chan, M. H. W., & Allara, D. L. (2007). Preparation, structure and optical properties of nanoporous gold thin films. *Langmuir*, 23, 2414-2422.
9. Mullen, T. J., Dameron, A. A., Saavedra, H. M., Lammert, P., Crespi, V. H., & Weiss, P. S. (2007). Dynamics of 1-adamantanethiolate displacement. *Journal of Physical Chemistry C*, 111, 6740-8.
10. Dameron, A. A., Mullen, T. J., Hengstebeck, R. W., Saavedra, H. M., Williams, M. E., & Weiss, P. S. (2007). Origins of 1-adamantanethiolate displacement. *Journal of Physical Chemistry C*, 111, 6747-6753.
11. Moore, A. M., Allara, D. L., & Weiss, P. S. (2007). Molecular devices. In *NNIN Nanotechnology Open Textbook*, 11, 1-29.

12. Shuster, M. J., Mullen, T. J., Vaish, A., Hohman, J. N., Gillmor, S. D., **Weiss, P. S., & Andrews, A. M.** (2008). Biospecific recognition of tethered small molecules diluted in self-assembled monolayers. *Advanced Materials*, *20*, 164-167.
13. Saavedra, H. M., Barbu, C. M., Dameron, A. A., Mullen, T. J., **Crespi, V. H., & Weiss, P. S.** (2007). 1-Adamantanethiolate monolayer displacement kinetics follow a universal form. *Journal of the American Chemical Society*, *129*, 10741-10746.
14. Srinivasan, C., Mullen, T. J., Anderson, M. E., Hohman, J. N., Dameron, A. A., Shuster, M. J., **Andrews, A. M., Horn, M. W., & Weiss, P. S.** (2007). Scanning electron microscopy of nanoscale chemical patterns. *ACS Nano*, *1*, 191-201.
15. Srinivasan, C., Hohman, J. N., Anderson, M. E., **Weiss, P. S., & Horn, M. W.** (2008). Nanostructures using self-assembled multilayers as molecular rulers and etch resists. *Journal of Vacuum Science and Technology B*, *26*, 1985-1988.
16. McGuinness, C. L., Blasini, D., Masejewski, J. P., Uppili, S., Cabarcos, O. M., Smilgies, D., & **Allara, D. L.** (2007). Molecular Self-Assembly at Bare Semiconductor Surfaces: Characterization of a Homologous Series of n-Alkanethiolate Monolayers on GaAs (001), *ACS Nano*, *1*, 30-49.
17. Neppl, S., Bauer, U., Menzel, D., Feulner, P., Shaporenko, A., Zharnikov, M., Kao, P., & **Allara, D. L.** (2007). Charge transfer dynamics in self-assembled monolayers. *Chem. Phys. Lett.*, *447*, 227-231.
18. Pursel, S., Lakhtakia, A., & **Horn, M. W.** (2007). Tuning of sculptured-thin-film spectral-hole filters by postdeposition etching. *Optical Engineering*, *46*, 040507-1-040507-3.
19. Zhang, F., Xu, J., Lakhtakia, A., Pursel, S. M., **Horn, M. W., & Wang, A.** (2007). Circularly polarized emission from colloidal nanocrystal quantum dots confined in microcavities formed by chiral mirrors. *Appl. Phys. Lett.*, *91*, 023102.
20. Pursel, S., **Horn, M. W.** (2007). Prospects for nanowire sculptured thin film devices. *Journal of Vacuum Science and Technology B*, *25*(6), 2611-2615.
21. Srinivasan, C. (2007). Precise nanogaps using self-assembled multilayers and lithographic resists. M.S. Thesis, Department of Engineering Science and Mechanics, The Pennsylvania State University, University Park, PA.
22. Srinivasan, C. (2008). Hybrid strategies for nanolithography and chemical patterning. Ph.D. Thesis, Department of Engineering Science and Mechanics, The Pennsylvania State University, University Park, PA.
23. Dhar, P., Cao, Y. Y., Kline, T., Pal, P., Swayne, C., Fischer, T. M., Miller, B., **Mallouk, T. E., Sen, A., & Johansen, T. H.** (2007). Autonomously moving local nanoprobe in heterogeneous magnetic fields. *Journal of Physical Chemistry C*, *111*, 3607-3613.

24. Hong, Y., Blackman, N. M. K., Kopp, N. D., **Velegol, D. & Sen, A.** (2007). Chemotaxis of Non-Biological Colloidal Rods. *Phys Rev Lett.*, *99*, 1781103/1-4.
25. Hutchins, B. M., Platt, M., **Hancock, W. O., & Williams, M. E.** (2007). Directing transport of CoFe₂O₄-functionalized microtubules with magnetic fields. *Small*, *3*, 126-131.
26. Huang, Y. M., Uppalapati, M., **Hancock, W. O., & Jackson, T. N.** (2007). Microtubule transport, concentration and alignment in enclosed microfluidic channels. *Biomedical Microdevices*, *9*, 175-184.
27. Ibele, M. E., Wang, Y., Kline, T. R., **Mallouk, T. E., & Sen, A.** (2007). Hydrazine fuels for bimetallic catalytic microfluidic pumping. *J. Am. Chem. Soc.*, *129*, 7762-7763.
28. Kline, T. R., Paxton, W. F., **Mallouk, T. E., & Sen, A.** (2007). Developing catalytic nanomotors. *Nanotechnology in Catalysis*, *3*, 23-37.
29. Takami, T., Ye, T., Arnold, D. P., Sugiura, K., Wang, R. M., Jiang, J. Z., & **Weiss, P. S.** (2007). Controlled adsorption orientation for double-decker complexes. *Journal of Physical Chemistry C*, *111*, 2077-2080.
30. Uppalapati, M., Huang, Y. M., **Jackson, T. N., & Hancock, W. O.** (2007). Microscale manipulation and spindle-like assembly of microtubules using dielectrophoresis. *Biophysical Journal*, 308A-309A.
31. Mantooth, B., Sykes, E., Han, P., Moore, A., Donhauser, Z., **Crespi, V. H., & Weiss, P. S.** (2007). Analyzing the motion of benzene on Au{111}: Single molecule statistics from scanning probe images. *Journal of Physical Chemistry C*, *111*, 6167 – 6182.
32. Uppalapati, M., Huang, Y. M., **Jackson, T. N., & Hancock, W. O.** (2008). Enhancing the stability of kinesin biomolecular motors for microscale transport applications. *Lab on a Chip*, *8*, 258-361.
33. Badalamenti, J. P., Weiss, L. E., Buckno, C. J., Richard, T. L., **Weiss, P. S., & Cirino, P.** (2007). Synthetic sports: A bacterial relay race. *IET Synthetic Biology*, *1*, 61-63.
34. Hutchins, B. M., Morgan, T. T., & **Williams, M. E.** (2007). Optical properties of fluorescent mixtures: Comparing quantum dots to laser eyes. *Journal of Chemical Education*, *84*, 1301-1303.
35. Kim, H., **Sofo, J. O., Velegol, D.,** Cole, M. W., & Lucas, A. (2007). Van der Waals dispersion forces between dielectric nanoclusters. *Langmuir*, *23*, 1735-1740.
36. Sasaki, T., & **Tour, J. M.** (2007). Synthesis of a dipolar nanocar. *Tetrahedron. Lett.*, *48*, 5821-5824.

37. Sasaki, T., Osgood, A. J., Alemany, L., **Kelly, K. F., & Tour, J. M.** (2008). Synthesis of a nanocar with an angled chassis, towards circling movement. *Organic Letters*, *10*, 229-232.
38. Sasaki, T., Morin, J.-F., Lu, M., & **Tour, J. M.** (2007). Synthesis of a single-molecule nanotruck. *Tetrahedron. Lett.*, *48*, 5817-5820.
39. Stojkovic, D., Lammert, P. E., & **Crespi, V. H.** (2007). Electronic bisection of a single-wall carbon nanotube by controlled chemisorptions. *Phys. Rev. Lett.*, *99*, 026802/1-4.
40. Shirai, Y.; Sasaki, T.; Guerrero, J. M.; Yu, B.-C.; Hodge, P.; **Tour, J. M.** (2008). Synthesis and photoisomerization of fullerene- and oligo(phenylene-ethynylene)-azobenzene derivatives. *ACSNano*, *2*, 97-106.
41. Giridharagopal, R., & **Kelly, K. F.** (2007). STM-induced desorption of polydiacetylene nanowires and reordering via molecular cascades. *Journal of Physical Chemistry C*, *111*, 6161-6166.
42. Subramanian, S., & **Catchmark, J. M.** (2008). Control of catalytically generated electroosmotic fluid flow through surface zeta potential engineering. *Journal of Physical Chemistry C*, *111*(32), 11959-11964.
43. Morin, J.-F.; Sasaki, T.; Shirai, Y.; Guerrero, J. M.; **Tour, J. M.** (2007). Synthetic routes toward carborane-wheeled nanocars. *J. Org. Chem.*, *72*, 9481-9490.
44. **Tour, J. M.** (2007). Transition to organic materials science. Passive, active and hybrid nanotechnologies. *J. Org. Chem.*, *72*, 7477-7496.
45. Eichfeld, C. M., Wood, C., Liu, B., Eichfeld, S. M., **Redwing, J. M., & Mohney, S. E.** (2007). Selective plating for junction delineation in silicon nanowires. *Nano Letters*, *7*, 2642-2644.
46. Gharb, N. Bassiri, Fujii, I., Hong, E., **Trolier-McKinstry, S.**, Taylor, D. V., & Damjanovic, D. (2007). Domain wall contributions to the properties of piezoelectric thin films. *J. Electroceramics*, *19*, 49-67.
47. Kurtz, J. S., Johnson, R. R., Tian, M. L., Kumar, N., Ma, Z. G., Xu, S. Y., & **Chan, M. H. W.** (2007). Specific heat of superconducting Zn nanowires. *Physical Review Letters*, *98*, 247001/1-247001/4.
48. Mina, I. G., Kim, H., Kim, I., Park, S., Choi, K., **Jackson, T. N., Tutwiler, R. L., & Trolier-McKinstry, S.** (2007). High frequency piezoelectric mems ultrasound transducers. *IEEE Trans. Ultrasonics, Ferroelectrics, and Frequency Control*, *54*(12), 2422-2430.

49. Bharadwaja, S. S. N., E. Hong, S. J. Zhang, L. E. Cross, and **S. Trolrier-McKinstry**. (2007). Nonlinear dielectric response in $(1-x)\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$ ($x = 0.045$ and 0.08) single crystals. *J. Appl. Phys.*, *101*, 104102.
50. **Vaughan, D. E. W.** (2007). Synthesis of sulfate and selenate sodalites and cancrinites with T-atom variations. *Stud. Surf. Sci. Catal.*, *170A*, 193-198.
51. **Vaughan, D. E. W.**, Pickering, I. J., George, G. N., & Shallenberger, J. R. (2007). Synthesis and characterization of Zn T-sites in mazzite, in *Turning points in solid state, materials and surface chemistry.*, Eds. K. D. M. Harris, P. P. Edwards, *Roy. Soc. Chem.*, pp. 260-272.
52. Xu, M., Harris, K. D. M., Thomas, J. M., & **Vaughan, D. E. W.** (2007). Probing the evolution of adsorption on nanoporous solids by in situ solid-state NMR spectroscopy. *Chem. Phys. Chem.*, *8*, 1311-1313.
53. Yates, T. J. V., Ward, E. P. W., Fernandez, J-J., **Vaughan, D.E.W.**, & Midgley, P. A. (2007). Three dimensional nanoscale tomographic analysis of the porosity, loading and fractal nature of disordered mesoporous silica catalysts. *J. Phys. Chem. C*, *111*, 11501-5.
54. Eichfeld, S. M., Ho, T-T., Eichfeld, C. M., Cranmer, A., **Mohney, S. E., Mayer, T. S., & Redwing, J. M.** (2007). Resistivity measurements of intentionally and unintentionally template-grown doped silicon nanowire arrays. *Nanotechnology*, *18*, 315201/1-4.
55. Liu, B. Z., Wang, Y. F., Dilts, S., **Mayer, T. S., & Mohney, S. E.** (2007). Silicidation of silicon nanowires by platinum. *Nano Letters*, *7*, 818-824.
56. **Sofa, J. O.**, Chaudhari, A. S., & Barber, G. D. (2007). Graphane: A two dimensional hydrocarbon. *Phys. Rev. B*, *75*, 153401-4.
57. Telli, M. B., **Trolrier-McKinstry, S.**, Woodward, D. I., & Reaney, I. M. (2007). Chemical solution deposited silver tantalate niobate, $\text{Ag}_x(\text{Ta}_{0.5}\text{Nb}_{0.5})\text{O}_{3-y}$ thin films on (111)Pt/Ti/SiO₂/Si substrates. *J. Sol-Gel Sci. Techn.*, *42*, 407-414.
58. Telli, M. B., Bharadwaja, S. S. N., Biegalski, M. D., Cheng, J. G., & **Trolrier-McKinstry, S.** (2007). (001) Epitaxial $\text{Ag}(\text{Ta}_{0.5}\text{Nb}_{0.5})\text{O}_3$ thin films on (001)SrRuO₃/(001)LaAlO₃ substrates by chemical solution deposition. *J. Appl. Phys.*, *101*, 014111/1-6.
59. Margine, E. R., Kolmogorov, A., Stojkovic, D., **Sofa, J. O. & Crespi, V. H.** (2007) Theory of genus reduction in alkali-induced graphitization of nanoporous carbon, *Phys. Rev. B*, *76*, 115436/1-5.
60. Zhang, X., Nimmatouri, P., **Redwing, J. M., & Dickey, E. C.** (2007). Diameter-dependent composition of vapor-liquid-solid grown Si_{1-x}Ge_x nanowires. *Nano Letters*, *7*, 3241-3245.

61. Adu, K., Gutierrez, H., Chen, G., Lew, K.-K., Nimmatoori, P., Zhang, X., **Dickey, E., Redwing, J.**, Eklund, P., & Lu, Q. (2008), Raman scattering from Si_{1-x}Gex alloy nanowires, *Journal of Physical Chemistry*, ASAP article, DOI: 10.1021/jp074764d.
62. Li, M., **Mayer, T. S.**, Siooss, J. A., **Keating, C. D.**, & Bhiladvala, R. B. (2007). Template-grown metal nanowires as resonators: Performance and characterization of dissipative and elastic properties. *Nano Lett.*, 7, 3281-3284.
63. Kubicki, J. D., Bandura, A. V. & **Sofa, J. O.** (2007). Comparison of TiO₂ and SnO₂ (100) and (110) hydrated surfaces via molecular modeling. *Geochim. Cosmochim. Acta* 71, A529 – A529.
64. Li, M., R. B. Bhiladvala, T. Morrow, J. Siooss, K.-K. Lew, **J. M. Redwing, C. D. Keating, & T. S. Mayer** (2008). Bottom-up assembly of large-area nanowire resonator arrays. *Nature Nanotechnology*, 3(2), 88-92.
65. Lee, M., Highstrete, C., Vallett, A., Dilts, S., **Redwing, J. M.**, and **Mayer, T. S.** (2007). Microwave Dissipation Spectra in Arrays of Silicon Nanowires, *IEEE MTT-S International Microwave Symposium Digest*, 1765-1767.
66. Ren, Y. H., Wang, D., Adyam, V., **Li, Q.**, Luepke, G., & Merlin, R. (2007). Generation and detection of coherent longitudinal acoustic phonons in the La_{0.67}Sr_{0.33}MnO₃ thin films by femtosecond light pulses. *Applied Physics Letters*, 90, 251918/1-251918/3.
67. Chalkova, E., Fedkin, M. V., **Komarneni, S.**, & **Lvov, S. N.** (2007). Nafion/zirconium phosphate composite membranes for PEMFC operating at up to 120 degrees C and down to 13% RH. *Journal of the Electrochemical Society*, 154, B288-B295.
68. **Khoo, I. C.**, Park, J. H., & Liou, J. (2007). All-optical switching of continuous wave, microsecond lasers with a dye-doped nematic liquid crystal. *Applied Physics Letters*, 90, 151107/1-151107/3.
69. Kubo, S., Diaz, A., **Mayer, T. S.**, **Khoo, I. C.**, & **Mallouk, T. E.** (2007). Tunability of the refractive index of gold nanoparticle suspensions. *Nano Lett.*, 7, 3418-3423.
70. Kwon, D.-H., Li, L., Bossard, J. A., Bray, M. G., & **Werner, D. H.** (2007). Zero index metamaterials with checkerboard structure. *Electronics Letters* 43, 319-320.
71. Liang, X. T., **Werner, D. H.**, & Weiner, B. (2007). A novel concept for reconfigurable frequency selective surfaces based on silicon switches. *Microwave and Optical Technology Letters*, 49, 109-114.
72. Bossard, J. A., Kwon, D.-H., Tang, Y., **Werner, D. H.**, & **Mayer, T. S.** (2007). Low-loss planar negative index metamaterials for the mid-infrared based on frequency selective

surfaces. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, Hawaii, 2873-2876.*

73. Bossard, J. A., Tang, Y., **Werner, D. H. & Mayer, T. S.** (2007). Genetic algorithm synthesis of planar zero index metamaterials for the infrared with application to electromagnetic cloaking. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, Hawaii, 5555-5558.*
74. Bossard, J. A., Yun, S., Tang, Y., Smith, J. A., **Werner, D. H. & Mayer, T. S.** (2007). Multiband all-dielectric frequency selective surface filters for the mid-infrared. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, Hawaii, 3416-3419.*
75. Wang, X., Kwon, D. H., **Werner, D. H., Khoo, I. C., A. V., & Shalaev, V. M.** (2007). Tunable optical negative-index metamaterials employing anisotropic liquid crystals. *Appl. Phys. Lett., 91, 143122/1-3.*
76. **Khoo, I. C.,** Diaz, A., Kwon, D., **Werner, D. H.,** Liou, J., Stinger, M., Park, J. H., Kubo, S., & **Mallouk, T.** (2007). Nonlinear and electro-optics of nano-dispersed nematic liquid crystals with tunable negative-, zero-, and positive indices. *J. Nonlinear Optical Physics & Materials, 16, 381-399.*
77. **Khoo, I. C.,** Diaz, A., Liou, J., Park, J. H., Stinger, M., Kubo, S., & **Mallouk, T.** (2007). Nanosecond-cw visible-IR all-optical switching and nonlinear transmission with nonlinear organic optical liquids and liquid crystals. *Proc. SPIE 6654 (Liquid Crystals XI), 66540D/1-66540D/7.*
78. Diaz, A., Kubo, S., Tang, Y., Liou, J., **Mayer, T. S., Khoo, I. C., & Mallouk, T. E.** (2007). Tunable refractive index materials with metallic nano-spheres dispersed in organic liquids. *Proc. SPIE 6654 (Liquid Crystals XI), 66540V/1-66540V/8.*
79. **Khoo, I. C., Werner, D., & Diaz, A.** (2007). Nano-spheres dispersed liquid crystal supra-nonlinear negative-zero-positive index metamaterials. *Conference on Organic Photonic Materials and Devices IX Photonic West 2007, San Jose, CA, 6407P-1–6407P-8.*
80. **Werner, D. H.,** Kwon, D.-H., **Khoo, I.-C.,** Kildishev, A. V., & Shalaev, V. M. (2007). Liquid crystal clad near-infrared metamaterials with tunable negative-zero-positive refractive indices. *Optics Express, 15(6), 3342–3347.*
81. Bossard, J. A., Tang, Y., **Werner, D. H., & Mayer, T. S.** (2007). Genetically designed multiband metallodielectric frequency selective surface filters for the mid-infrared. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI, 3404-3407.*

82. Bayraktar, Z., Bossard, J. A., & **Werner, D. H.** (2007). AMC metamaterials for low-profile antennas mounted on or embedded in composite platforms. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI* 1305-1308.
83. Liang, X., Weiner, B., **Werner, D. H., & Khoo, I. C.** (2007). Nano-dispersed liquid crystal tunable negative-zero-positive index metamaterials. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI* 3408-3411.
84. Bossard, J. A., Kwon, D.-H., Tang, Y., **Werner, D. H., & Mayer, T. S.** (2007). Low loss planar negative index metamaterials for the mid-infrared based on frequency selective surfaces. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 2873–2876.
85. Kwon, D.-H. & **Werner, D. H.** (2007). Synthesis of zero-index metamaterial slabs using genetic algorithms. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 2229–2232.
86. **Badding, J. V.**, Sazio, P. J. A., **Gopalan, V.**, Amezcua-Correa, A., Scheidemantel, T. J., Finlayson, C. E., Baril, N. F., Jackson, B. R., & Wong, D. (2007). Integrated optoelectronics in an optical fiber. *Proceedings of SPIE – The International Society for Optical Engineering*, 6475, 64750N/1-9.
87. Baril, N. F., **Badding, J. V., Gopalan, V.**, Sazio, P. J. A., Scheidemantel, T. J., Jackson, B. R., Won, D.-J., Amezcua-Correa, A., & Finlayson, C. (2007). Microstructured optical fibers as new nanotemplates for high pressure CVD. *Materials Research Society Symposium Proceedings*, 0988-QQ04-02/1-5.
88. Finlayson, C. E., Amezcua-Correa, A., Sazio, P. J. A., Baril, N. F., & **Badding, J. V.** (2007). Electrical and Raman characterization of silicon and germanium-filled microstructured optical fibers. *Applied Physics Letters*, 90, 132110/1-132110/3.
89. Kildishev, A. V., Chettiar, U. K., Liu, Z., Kwon, D.-H., Bayraktar, Z., **Werner, D. H.**, & Shalaev, V. M. (2007). Stochastic optimization of low-loss optical negative index metamaterial. *Journal of the Optical Society of America B*, 24(10), A34-A39.
90. Kwon, D. H. & **Werner, D. H.** (2007). Near-infrared metamaterials with dual-band negative-index characteristics. *Optics Express*, 15, 1647-1652.
91. Kwon, D.-H., & **Werner, D. H.** (2007). Low-index metamaterial designs in the visible spectrum. *Optics Express*, 15, 9267-9272.
92. **Khoo, I. C.** (2007). *Liquid Crystals*, 2nd ed. New York: Wiley.
93. Won, D. J., Ramirez, M. O., Baril, N. F., Sazio, P. J. A., **Badding, J. V., & Gopalan, V.** (2007). All optical modulation in silicon filled microstructured optical fibers. *Appl. Phys. Lett.*, 91, 16112/1-3.

94. **Gopalan, V., Badding, J.V.,** Sazio, P.J.A., & Peacock, A.C. (2008), Endoscopic fiber: microfluidic chemical deposition moves optical fiber to the nanoscale, *Laser Focus World*, January 2008, 135-138.
95. Kildishev, A. V., Drachev, V. P., Chettiar, U. K., Shalaev, V. M., **Werner, D. H.,** & Kwon, D.-H. (2007). Comment on 'Negative refractive index in artificial metamaterials.' *Optics Letters*, 32(11), 1510–1511.
96. Kwon, D.-H. & **Werner, D. H.** (2008). Two-dimensional eccentric elliptic electromagnetic cloaks. *Appl. Phys. Lett.*, 92, 013505/1-3.
97. Pellen, M. E., Bray, M. G., Petko, J. S., **Werner, D. H.,** Xiong, Q., Chen, G., & Eklund, P. C. (2007). Electromagnetic scattering from long nanowires. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 3392-3395.
98. Kwon, D.-H., **Werner, D. H., Khoo, I.-C.,** Kildishev, A. V., & Shalaev, V. M. (2007). Liquid crystal clad metamaterial with a tunable negative-zero-positive index of refraction. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 2881–2884.
99. Kwon, D.-H., **Werner, D. H.,** Kildishev, A. V., & Shalaev, V. M. (2007). Dual-band negative-index metamaterials in the near-infrared frequency range. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 2861–2864.
100. Kwon, D.-H., Bayraktar, Z., **Werner, D. H.,** Chettiar, U. K., Kildishev, A. V., & Shalaev, V. M. (2007). Nature-based optimization of 2D negative-index metamaterials. *Proceedings of the 2007 IEEE Antennas and Propagation Society International Symposium, Honolulu, HI*, 1589–1592.
101. Kwon, D.-H., Li, L., Bossard, J. A., Bray, M. G., & **Werner, D. H.** (2007). Zero index metamaterials with checkerboard structure. *Electronics Letters*, 43, 319-320.
102. Kwon, D. H., & **Werner, D. H.** (2007). Synthesis of low-index metamaterial slabs using genetic algorithms. *Optics Express*, 15, 9267-9272.
103. Liu, Z., Chettiar, U. K., Kildishev, A. V., Shalaev, V. M., Kwon, D.-H., Bayraktar, Z., & **Werner, D. H.** (2007). Optical negative index metamaterials with low losses: Nature-inspired methods for optimal design. *Proceedings of the 2007 OSA Topical Meeting in Photonic Metamaterials: From Random to Periodic, Jackson Hole, WY*, TuB23.
104. Kwon, D.-H., Bossard, J. A., & **Werner, D. H.** (2007). Optical metamaterials with low and zero index of refraction. *Proceedings of the 2007 URSI North American Radio Science Meeting, Ottawa, Canada*.

105. Zurbuchen, M. A., Freitas, R. S., Wilson, M. J., **Schiffer, P.**, Roeckerath, M., Schubert, J., Biegalski, M. D., Mehta, G. H., Comstock, D. J., Lee, J. H., Jia, Y., & **Schlom, D. G.** (2007). Synthesis and Characterization of an $n = 6$ Aurivillius Phase Incorporating Magnetically Active Manganese, $\text{Bi}_7(\text{Mn,Ti})_6\text{O}_{21}$, *Applied Physics Letters* 91, 033113-1 – 033113-3.
106. Nisoli, C., Wang, R., Li, J., McConville, W. F., Lammert, P. E., **Schiffer, P.** & **Crespi, V. H.** (2007). Ground state lost but degeneracy found: The effective thermodynamics of artificial spin ice. *Phys. Rev. Lett.*, 98, 217203/1-4.
107. Ihlefeld, J. F., Kumar, A., **Gopalan, V.**, **Schlom, D. G.**, Chen, Y. B., Pan, X. Q., Heeg, T., Schubert, J., Ke, X., **Schiffer, P.**, Orenstein, J., Martin, L. W., Chu, Y. H., & **Ramesh, R.** (2007). Adsorption-Controlled Molecular-Beam Epitaxial Growth of BiFeO_3 . *Applied Physics Letters*, 91, 071922-1 – 071922-3.
108. Li, Y. L., Hu, S. Y., Tenne, D., Soukiassian, A., **Schlom, D. G.**, **Xi, X. X.**, Choi, K. J., Eom, C. B., Saxena, A., Lookman, T., Jia, Q. X., & **Chen, L. Q.** (2007). Prediction of ferroelectricity in $\text{BaTiO}_3/\text{SrTiO}_3$ superlattices with domains. *Applied Physics Letters*, 91, 112914-1—112914-3.
109. Soukiassian, A., W. Tian, D. A. Tenne, **X. X. Xi, D. G. Schlom**, N. D. Lanzillotti-Kimura, A. Bruchhausen, A. Fainstein, H. P. Sun, X. Q. Pan, A. Cros, & A. Cantarero (2007). Acoustic Bragg mirrors and cavities made using piezoelectric oxides, *Appl. Phys. Lett.* 90, 042909.
110. Tian, W., J. H. Haeni, **D. G. Schlom**, E. Hutchinson, B. L. Sheu, M. M. Rosario, **P. Schiffer**, Y. Liu, M. A. Zurbuchen, & X. Q. Pan (2007). Epitaxial growth of the first five members of the layered $\text{Sr}_{n+1}\text{Ru}_n\text{O}_{3n+1}$ oxide series. *Applied Physics Letters* 90, 022507-1-3.
111. Xu, Z., X. Xu, R. S. Freitas, Z. Long, M. Zhou, D. Fobes, M. Fang, **P. Schiffer**, Z. Mao, & Y. Liu (2007). Magnetic, electrical transport, and thermoelectric properties of $\text{Sr}_4\text{Ru}_3\text{O}_{10}$: Evidence for a field-induced electronic phase transition at low temperatures. *Physical Review B*, 76, 094405– 1- 6.
112. **Schlom, D. G.**, **Chen, L. Q.**, Eom, C. B., **Rabe, K. M.**, Streiffer, S. K. & Triscone, J.-M. (2007). Strain Tuning of Ferroelectric Thin Films. *Annual Review of Materials Research*, 37, 589-626.
113. Kumar, A., L. W. Martin, S. Denev, Q. Zhan, M. Chi, T. Mizoguchi, J. B. Kortright, J. Kreisel, N. Browning, **R. Ramesh**, Y. Suzuki, & **V. Gopalan** (2007). Polar and magnetic properties of PbVO_3 thin films. *Physical Review B-Rapid Communications*, 75, 060101-1 – 060101-4.
114. Zhang, J. X., Li, Y. L., **Schlom, D. G.**, **Chen, L. Q.**, Zavaliche, F., **Ramesh, R.**, & Jia, Q. X. (2007). Phase-field model for epitaxial ferroelectric and magnetic nanocomposite thin

- films. *Applied Physics Letters*, *90*, 052909/1-052909/3.
115. Zhang, J. X., Li, Y. L., Wang, Y., Liu, Z. K., **Chen, L. Q.**, Chu, Y. H., Zavaliche, F., & **Ramesh, R.** (2007). Effect of substrate-induced strains on the spontaneous polarization of epitaxial BiFeO₃ thin films. *Journal of Applied Physics*, *101*, 114105-1—114105-6.
 116. Li, J., Wang, R., McConville, W., Nisoil, C., Ke, X., Lammert, P. E., **Crespi, V. H.**, & **Schiffer, P.** (2007). Demagnetization protocols for frustrated interacting nanomagnet arrays. *Journal of Applied Physics*, *101*, 09J104/1-3.
 117. Kalinin, S. V., Jesse, S., Rodriguez, B. J., Eliseev, E. A., & **Gopalan, V.**, Morozovska, A. N. (2007). Quantitative determination of the tip parameters in piezoresponse force microscopy. *Appl. Phys. Lett.* *90*, 212905/1—212905/3.
 118. Tenne, D. A., I. E. Gonenli, A. Soukiassian, **D. G. Schlom**, S. M. Nakhmanson, **K. M. Rabe**, & **X. X. Xi** (2007). Raman study of oxygen reduced and re-oxidized strontium titanate. *Phys. Rev. B* *76*, 024303.
 119. Cruz, M.P., Y.H. Chu, J.X. Zhang, P.L. Yang, F. Zavaliche, Q. He, P. Shafer, **L.Q. Chen**, & **R. Ramesh** (2007). Strain control of domain-wall stability in epitaxial BiFeO₃ (110) films. *Physical Review Letters*, *99*, 217601-1 - 217601-4.
 120. Choudhury, S., **L.Q. Chen**, & Y.L. Li (2007). Correlation between number of ferroelectric variants and coercive field of lead ziconate titanate single crystals. *Applied Physics Letters*, *91*, 032902-1 - 032902-3.
 121. Ramirez, M.O., M. Krishnamurthy, S. Denev, A. Kumar, S.-Y. Yang, Y. H. Chu, E. Saiz, A. P. Pyatakov, A. Bush, D. Viehland, J. Orenstein, R. Ramesh, & **V. Gopalan** (2007). Two-phonon coupling to the antiferromagnetic phase transition in multiferroic BiFeO₃. *Applied Physics Letters*, *92*, 022511-1 - 022511-3.
 122. Kumar, A., R.C. Rai, N.J. Podraza, S. Denev, M. Ramirez, Y-H. Chu, J. Ihlefeld, T. Heeg, J. Schubert, **D.G. Schlom**, J. Orenstein, **R. Ramesh**, R.W. Collins, J.L. Musfeldt, & **V. Gopalan** (2008). Linear and Nonlinear Optical Constants of BiFeO₃. *Los Alamos National Laboratory, Preprint Archive, Condensed Matter*, 1-4, arXiv:0801.1626v1.
 123. Durbin, S., Jach, T., Kim, S., & **Gopalan, V.** (2007). Natural focusing of rays from ferroelectric lithium niobate wafers. *Appl. Phys. Lett.* *91*, 142909-1—142909-3.
 124. **Gopalan, V.**, Dierolf, V., & Scrymgeour, D. (2007). Defect-domain wall interactions in trigonal ferroelectrics. *Annual Reviews of Materials Research*, *37*, 449-489.
 125. Yuan, M., **Badding, J. V.**, **Sen, A.**, Dahlberg, M. and **Schiffer, P. E.** (2007). Controlled assembly of zero-, one-, two- and three-dimensional metal chalcogenide structures. *Inorg. Chem., (Communication)*, *46*(18), 7238-7240.

126. Cai, J., & **Mahan, G. D.** (2007). Energy bands of quantum dot arrays. *Physical Review B*, 76, 205116/1-6.
127. Knappenberger, K. L., Clayborne, P. A., Reveles, J. U., Sobhy, M. A., Jones, C. E., Gupta, U. U., Khanna, S. N., Iordanov, I., **Sofa, J. O.** & Castleman, W. (2007). Anion photoelectron spectroscopy and density functional investigation of Diniobium–Carbon clusters. *ACS Nano* 1, 319 – 326.
128. Castleman, A. W., Jr., Khanna, S. N., **Sen, A.**, Reber, A. C., Qian, M., Davis, K. M., Peppernick, S. J., Ugrinov, A., & Merritt, M. D. (2007). From designer clusters to synthetic crystalline nanoassemblies. *Nano Lett.*, 7, 2734-2741.
129. **Catchmark, J. M.**, & Subramanian, S. (2007). Fluidic and sorting devices based on catalytically produced electrokinetic phenomena. U.S. Provisional Patent 60/887,934, filed February 2, 2007.
130. **Trolier-McKinstry, S., T. N. Jackson,** K. Choi, R. L. Tutwiler, I.S. Kim, H.S. Park, S. K. Park, & I. G. Mina. High frequency ultrasound transducers. US patent application No. 11/745,615, filed May 8, 2007.
131. **Werner, D. H.**, & Kwon, D.-H. (2007). Elimination of coupling and interference between antennas in multi-standard multi-antenna systems and methods thereof. Invention disclosure filed on December 7, 2007, Penn State Invention Disclosure Number 2007-3394.