

14. MRSEC-SUPPORTED PUBLICATIONS AND PATENTS
(March 1, 2011 – February 29, 2012)

† denotes publications with international co-authors

*denotes undergraduate authors

IRG-1 ENGINEERED MULTIBLOCK POLYMERS

IRG-1 Publications resulting from PRIMARY MRSEC Support

Zhang, Z.; Sides, S.; **Bates, F.S.** *Ordering of Sphere Forming SISO Tetrablock Terpolymers on a Simple Hexagonal Lattice*. *Macromolecules*, **2012**, *45*. <http://dx.doi.org/10.1021/ma202196c>

Redline, E.M.; **Francis, L.F.**; **Bates, F.S.** *Radical-Cured, Block Copolymer-Modified Thermosets*. *J. Polym. Sci., Polym. Phys.*, **2011**, *49*, 540. <http://dx.doi.org/10.1002/polb.22196>

Zhang, S.; Lee, K.H.; **Frisbie, C.D.**; **Lodge, T.P.** *Ionic Conductivity, Capacitance, and Viscoelastic Properties of Block-Copolymer Based Ion Gels*. *Macromolecules*, **2011**, *44*, 940-949. <http://dx.doi.org/10.1021/ma102435a> (Cross referenced under IRG-2)

Zhang, S.; Lee, K.H.; Sun, J.*; **Frisbie, C.D.**; **Lodge, T.P.** *Viscoelastic Properties, Ionic Conductivity, and Materials Design Considerations for Poly(styrene-*b* ethylene oxide-*b*-styrene)-Based Ion Gel Electrolytes*. *Macromolecules*, **2011**, *44*, 8981-8989. <http://dx.doi.org/10.1021/ma201356j> (Cross referenced under IRG-2)

Baruth, A.; Rodwogin, M.D.; Shankar, A.; Erickson, M.J.; **Hillmyer, M.A.**; **Leighton, C.** *Non-Liftoff Block Copolymer Lithography of 25 nm Magnetic Nanodot Arrays*. *ACS Appl. Mater. Interfaces*, **2011**, *3*, 3472-3481. <http://dx.doi.org/10.1021/am200693x> (Cross referenced under IRG-3)

Zhou, C.; **Hillmyer, M.A.**; **Lodge, T.P.** *Micellization and Micellar Aggregation of Poly(ethylene-*alt*-propylene)-*b*-Poly(ethylene oxide)-*b*-Poly(*N*-isopropylacrylamide) Triblock Terpolymers in Water*. *Macromolecules*, **2011**, *44*, 1635-1641. <http://dx.doi.org/10.1021/ma102786q>

Jones, B.H.; Cheng, K.-Y.; **Holmes, R.J.**; **Lodge, T.P.** *Nanoporous Poly(3,4 ethylenedioxythiophene) Derived from Polymeric Bicontinuous Microemulsion Templates*. *Macromolecules*, **2011**, Article ASAP. <http://dx.doi.org/10.1021/ma202239b> (Cross referenced under IRG-2)

Jones, B.H.; Cheng, K.-Y.; **Holmes, R.J.**; **Lodge, T.P.** *Nanoporous Polyethylene Thin Films Templates by Polymeric Bicontinuous Microemulsions: Evolution of Morphology on Non-Neutral Substrates*. *ACS Applied Materials and Interfaces*, **2011**, *3*, 4101-4111. <http://dx.doi.org/10.1021/am2009794> (Cross referenced under IRG-2)

Jones, B.H.; **Lodge, T.P.** *Hierarchically Porous Silica Prepared from Ionic Liquid and Polymeric Bicontinuous Microemulsion Templates*. *Chem. Mater.*, **2011**, *23*, 4824-4831. <http://dx.doi.org/10.1021/cm202170g>

Jones, B.H.; **Lodge, T.P.** *Hierarchically Structured Materials from Block Polymer Confinement within Bicontinuous Microemulsion-Derived Nanoporous Polyethylene*. *ACS Nano*, **2011**, *5*, 8914-8927. <http://dx.doi.org/10.1021/nn203096x>

Lee, K.H.; Zhang, S.; **Lodge, T.P.**; **Frisbie, C.D.** *Electrical Impedance of Spin Coatable Ion Gel Films*. *J. Phys. Chem. B*, **2011**, *115*, 3315-3321. <http://dx.doi.org/10.1021/jp110166u> (Cross referenced under IRG-2)

Torija, M.; Choi, S.-H.; **Lodge, T.P.**; **Bates, F.S.** *Large Amplitude Oscillator Shear of Block Copolymer Spheres on a Body-Centered Cubic Lattice: Are Micelles Like Metals?* *J. Phys. Chem. B.*, **2011**, *115*, 5840-5848. <http://dx.doi.org/10.1021/jp202468y>

Thiagarajan, R.; **Morse, D.C.** *Micellization Kinetics of Diblock Copolymers in a Homopolymer Matrix: A Self-Consistent Field Study.* J. Phys.: Condensed Matter, **2011**, *23*, 284109. <http://dx.doi.org/10.1088/0953-8984/23/28/284109>

IRG-1 Publications resulting from PARTIAL MRSEC Support

Choi, S.-H.; **Bates, F.S.; Lodge, T.P.** *Molecular Exchange in Ordered Diblock Copolymer Micelles.* Macromolecules, **2011**, *44*, 3594-3604. <http://dx.doi.org/10.1021/ma102788v>

Choi, S.-H.; Lee, S.; Soto, H.E. *(PREM); **Lodge, T.P.; Bates, F.S.** *Nanoscale Mixing of Soft Solids.* J. Am. Chem. Soc., **2011**, *133*, 1722-1725. <http://dx.doi.org/10.1021/ja110871b>

†Huang, C.-I.; †Liao, C.-H.; **Lodge, T.P.** *Multicompartment Micelles from A₂-star-(B-alt-C) Block Terpolymers in Selective Solvents.* Soft Matter, **2011**, *7*, 5638-5647. <http://dx.doi.org/10.1039/c1sm05159h>

Torija, M.; Choi, S.-H.; **Lodge, T.P.; Bates, F.S.** *Large Amplitude Oscillatory Shear of Block Copolymer Spheres on a Body-Centered Cubic Lattice: Are Micelles Like Metals?* J. Phys. Chem. B, **2011**, *115*, 5840-5848. <http://dx.doi.org/10.1021/jp202468y>

Liao, K.K.-H.; Mittal, A.; Bose, S.; **Leighton, C.; Mkhoyan, K.A.; Macosko, C.W.** *Aqueous Only Route to Graphene from Graphite Oxide.* ACS Nano, **2011**, *5*, 1253. <http://dx.doi.org/10.1021/nn1028967> (Cross referenced under IRG-3, IRG-4)

Publications resulting from IRG-1 research, but do not acknowledge the MRSEC award

Amendt, M.A.; Roerdink, M.; Moench, S.; Phillip, W.A.; **Cussler, E.L.; Hillmyer, M.A.** *Functionalized Nanoporous Membranes from Reactive Triblock Terpolymers.* Aust. J. Chem., **2011**, *64*, 1074–1082. <http://www.publish.csiro.au/paper/CH11130.htm>

Stevens, D.M.; Speros, J.C.; **Hillmyer, M.A.; Frisbie, C.D.** *Relationship Between Diode Saturation Current and Open Circuit Voltage in Poly(3-alkylthiophene) Solar Cells as a Function of Device Architecture, Processing Conditions, and Alkyl Side Chain Length.* J. Phys. Chem. C. **2011**, *115*, 20806–20816. <http://dx.doi.org/10.1021/jp2070612> (Cross referenced under IRG-2)

Garg, A.; **Kokkoli, E.** *Enhanced Intracellular Delivery Using PEGylated pH-Sensitive Liposomes Modified with a Fibronectin-Mimetic Peptide Targeted to Colon Cancer Cells.* *Curr. Pharm. Biotechnol.*, **2011** *12*, 1135-1143. <http://www.benthamdirect.org/pages/content.php?CPB/2011/00000012/00000008/0006G.SGM>

Lopez-Barron, C.R.; **Macosko, C.W.** *Measurement of Geometrical Parameters in Cocontinuous Polymer Blends: 3D Versus 2D Image Analysis.* J Microscopy, **2011**, *242*(3), 242-249. <http://dx.doi.org/10.1111/j.1365-2818.2010.03462.x>

IRG-2 ORGANIC OPTOELECTRONIC INTERFACES

IRG-2 Publications resulting from *PRIMARY* MRSEC Support

- Xie, W.; **Frisbie, C.D.** *Organic Electrical Double Layer Transistors Based on Rubrene Single Crystals: Examining Transport at High Surface Charge Densities above 10^{13} cm⁻²*. J. Phys. Chem. C, **2011**, *115*, 14360-14368. <http://pubs.acs.org/doi/abs/10.1021/jp204152y>
- Zhang, S.; Lee, K.H.; **Frisbie, C.D.**; **Lodge, T.P.** *Ionic Conductivity, Capacitance, and Viscoelastic Properties of Block Copolymer-Based Ion Gels*. Macromolecules, **2011**, *44*, 940-949. <http://dx.doi.org/10.1021/ma102435a> (Cross referenced under IRG-1)
- Zhang, S.; Lee, K.H.; Sun, J.; **Frisbie, C.D.**; **Lodge, T.P.** *Viscoelastic Properties, Ionic Conductivity, and Materials Design Considerations for Poly(styrene-*b*-ethylene oxide-*b*-styrene)-Based Ion Gel Electrolytes*. Macromolecules, **2011**, *44*, 8981-8989. <http://dx.doi.org/10.1021/ma201356j> (Cross referenced under IRG-1)
- Erickson, N.C.; **Holmes, R.J.** *Relating Charge Transport and Performance in Single-Layer Graded-Composition Organic Light-Emitting Devices*. J. Appl. Phys., **2011**, *110*, 084515. <http://dx.doi.org/10.1063/1.3653285>
- Jones, B.H.; Cheng, K.-Y.; **Holmes, R.J.**; **Lodge, T.P.** *Nanoporous Poly(3,4-ethylenedioxythiophene) Derived from Polymeric Bicontinuous Microemulsion Templates*. Macromolecules, **2011**, Article ASAP. <http://dx.doi.org/10.1021/ma202239b> (Cross referenced under IRG-1)
- Jones, B.H.; Cheng, K.-Y.; **Holmes, R.J.**; **Lodge, T.P.** *Nanoporous Polyethylene Thin Films Templated by Polymeric Bicontinuous Microemulsions: Evolution of Morphology on Non-Neutral Substrates*. ACS Appl. Mater. Interfaces, **2011**, *3*, 4101. <http://dx.doi.org/10.1021/am2009794> (Cross referenced under IRG-1)
- Lodden, G.H.; **Holmes, R.J.** *Polarization Splitting in Polariton Electroluminescence From an Organic Semiconductor Microcavity with Metallic Reflectors*. Appl. Phys. Lett., **2011**, *98*, 233301. <http://dx.doi.org/10.1063/1.3599058>
- Lodden, G.H.; **Holmes, R.J.** *Thermally Activated Population of Microcavity Polariton States Under Optical and Electrical Excitation*. Phys. Rev. B, **2011**, *83*, 075301. <http://dx.doi.org/10.1103/PhysRevB.83.075301>
- Lee, K.H.; Zhang, S.; **Lodge, T.P.**; **Frisbie, C.D.** *Electrical Impedance of Spin-Coatable Ion Gel Films*. J. Phys. Chem. C, **2011**, *115*, 3315-3321. <http://dx.doi.org/10.1021/jp110166u> (Cross referenced under IRG-1)
- Kang, M.S.; Sahu, A.; **Norris, D.J.**; **Frisbie, C.D.** *Size- and Temperature-Dependent Charge Transport in PbSe Nanocrystal Thin Films*. Nano. Lett., **2011**, *11*, 3887-3892. <http://dx.doi.org/10.1021/nl2020153> (Cross referenced under IRG-4)
- Chang, H.-C.; **Ruden, P.P.**; Liang, Y.; **Frisbie, C.D.** *Charge Carrier Extraction Dynamics for Local Field Effect Transistor Structures*. Appl. Phys. Lett., **2011**, *99*, 073306. <http://dx.doi.org/10.1063/1.3625945>
- Liang, Y.; Chang, H.-C.; **Ruden, P.P.**; **Frisbie, C.D.** *Examination of Au, Cu, and Al Contacts in Organic Field Effect Transistors via Displacement Current Measurements*. J. Appl. Phys., **2011**, *110*, 064514. <http://dx.doi.org/10.1063/1.3638706>

IRG-2 Publications resulting from PARTIAL MRSEC Support

Beljonne, D.; Cornil, J.; Muccioli, L.; Zannoni, C.; **Brédas, J.L.**; Castet, F. *Electronic Processes at Organic-Organic Interfaces: Insight from Modeling and Implications for Opto-Electronic Devices*. Chemistry of Materials, **2011**, *23*, 591-609. <http://dx.doi.org/10.1021/cm1023426>

Ellison, D.J.; Kim, J.Y.; Stevens, D.M.; **Frisbie, C.D.** *Determination of Quasi-Fermi Levels Across Illuminated Organic Donor/Acceptor Heterojunctions by Kelvin Probe Force Microscopy*. J. Am. Chem. Soc., **2011**, *133*, 13802-13805. <http://dx.doi.org/10.1021/ja2034574>

Luhman, W.A.; Lee, S.H.; Johnson, T.W.; **Holmes, R.J.**; Oh, S.-H.. *Self-Assembled Plasmonic Electrodes for High-Performance Organic Photovoltaic Cells*. Appl. Phys. Lett., **2011**, *99*, 103306. <http://dx.doi.org/10.1063/1.3635385>

Luhman, W.A.; **Holmes, R.J.** *Investigation of Energy Transfer in Organic Photovoltaic Cells and Impact on Exciton Diffusion Length Measurements*. Adv. Func. Mater., **2011**, *21*, 764. <http://dx.doi.org/10.1002/adfm.201001928>

Cheng, K.-Y.; Anthony, R.; **Kortshagen, U.R.**; **Holmes, R.J.** *High-Efficiency Silicon Nanocrystal Light-Emitting Devices*. Nano Lett., **2011**, *11*, 5. <http://dx.doi.org/10.1021/nl2001692> (Cross referenced under IRG-4)

Pandey, R.; Gunawan, A.A.; **Mkhoyan, K.A.**; **Holmes, R.J.** *Efficient Organic Photovoltaic Cells Based on Nanocrystalline Mixtures of Boron Subphthalocyanine Chloride and C₆₀*. Adv. Func. Mat., **2011**. <http://dx.doi.org/10.1002/adfm.201101948> (Cross referenced under IRG-4)

Publications resulting from IRG-2 research, but do not acknowledge the MRSEC award

Yagodkin, E.; McGarry, K.; **Douglas, C.J.** *Preparation of 6,11-Dihydroxy-5,12-Tetracenedione*. Org. Prep. Proc. Int., **2011**, *43*, 360-363. <http://dx.doi.org/10.1080/00304948.2011.594006>

Lee, M.; Williams, J.R.; Zhang, S.; **Frisbie, C.D.**; Goldhaber-Gordon, D. *Electrolyte Gate-Controlled Kondo Effect in SrTiO₃*. Phys. Rev. Lett., **2011**. <http://arxiv.org/abs/1108.0139>

Stevens, D.M.; Speros, J.C.; **Hillmyer, M.A.**; **Frisbie, C.D.** *Relationship Between Diode Saturation Current and Open Circuit Voltage in Poly(3-alkylthiophene) Solar Cells as a Function of Device Architecture, Processing Conditions, and Alkyl Side Chain Length*. J. Phys. Chem. C. **2011**, *115*, 20806–20816. <http://dx.doi.org/10.1021/jp2070612> (Cross referenced under IRG-1)

Chan, W.-L.; Tritsch, J.; Dolocan, A.; Ligges, M.; Miaja-Avila, L.; **Zhu, X.-Y.** *Momentum Resolved Quantum Interference in Optically Excited Surface States*. J. Chem. Phys., **2011**, *135*, 031101. <http://dx.doi.org/10.1063/1.3615541>

IRG-3 MAGNETIC HETEROSTRUCTURES

IRG-3 Publications resulting from PRIMARY MRSEC Support

Hsu, H.; † Blaha, P.; **Cococcioni, M.**; **Wentzcovitch, R. M.** *Spin-State Crossover and Hyperfine Interactions of Ferric Iron in MgSiO₃ Perovskite*. Phys. Rev. Lett., **2011**, *106*, 118501. <http://dx.doi.org/10.1103/PhysRevLett.106.118501>

Hu, Q.O.; Garlid, E.S.; **Crowell, P.A.**; **Palmstrøm, C.J.** *Spin Accumulation Near Fe/GaAs Interfaces: The Role of Semiconductor Band Structure*. Phys. Rev. B, **2011**, *84*, 085306. <http://dx.doi.org/10.1103/PhysRevB.84.085306>

Zhang, Y.; Zhao, Y.; Lyle, A.; **Crowell, P.A.**; **Wang, J.P.** *Spin Torque Oscillation Modes of a Dual Magnetic Tunneling Junction*. J. Appl. Phys., **2011**, *109*, 07D307. <http://dx.doi.org/10.1063/1.3536538>

Baruth, A.G.; Rodwogin, M.D.; Shankar, A.*; **Hillmyer, M.A.**; **Leighton, C.** *Non Lift-Off Block Copolymer Lithography of 25 nm Magnetic Nanodot Arrays*. ACS Applied Materials and Interfaces, **2011**, *3*, 3472-3481. (*University of Minnesota) (Cross referenced under IRG-1) <http://dx.doi.org/10.1021/am200693x>

Sharma, M.; Aarboogh, H.*; Thiele, J.-U.; Maat, S.; Fullerton, E.E.; **Leighton, C.** *Magnetotransport Properties of Epitaxial MgO(001)/FeRh Films Across the Antiferromagnet to Ferromagnet Transition*. J. Appl. Phys. **2011**, *109*, 083913. (*University of Minnesota) <http://dx.doi.org/10.1063/1.3573503>

Hernandez, S.; Tan L.; **Stadler, B.J.H.**; **Victoria, R.H.** *Micromagnetic Calculation of Spin Transfer Torque in Co/Cu Multilayer Nanowires*. J. Appl. Phys., **2011**, *109*, 07C916. <http://dx.doi.org/10.1063/1.3562924>

Lyle, A.P.; Harms, J.; Klein, T.; Lentsch, A.; *Martens, D.; *Klemm, A.; **Wang, J.-P.** *Spin Torque Transfer Programming Dipole Coupled Nanomagnet Arrays*. Appl. Phys. Lett., **2012**, *100*, 012402. <http://dx.doi.org/10.1063/1.3673618> (*Martens, D.; MRSEC REU Participant, 2011, University of Connecticut; *Klemm, A.: U of Wisconsin, NSF NNIN REU Summer student, 2010)

Lyle, A.P.; Harms, J.; Klein, T.; Lentsch, A.; Klemm, A.*; Martens, D.*; **Wang, J.-P.** *Integration of Spintronic Interface for Nanomagnetic Arrays*. AIP Advances, **2011**, *1*, 042177. <http://dx.doi.org/10.1063/1.3672177> (*Martens, D.; MRSEC REU Participant, 2011, University of Connecticut; *Klemm, A.: NSF NNIN REU Summer student, 2010)

Lyle, A.P.; Klemm, A.*; Harms, J.; Zhang, Y.; Zhao, H.; **Wang, J.-P.** *Probing Dipole Coupled Nanomagnets Using Magnetoresistance Read*. Appl. Phys. Lett., **2011**, *98*, 092502. <http://dx.doi.org/10.1063/1.3558915> (*Klemm, A: NNIN REU Participant, 2010)

Lyle, A.; Patil, S.; Harms, J.; Glass, B.*; Yao, X.; Lilja, D.; **Wang, J.-P.** *Magnetic Tunnel Junction Logic Architecture for Realization of Simultaneous Computation and Communication*. IEEE Transactions on Magnetics, **2011**, *47*, 2970. <http://dx.doi.org/10.1109/TMAG.2011.2158527> (*University of Minnesota)

Zhang, Y.; Zhao, H.; Lyle, A.P.; **Wang, J.-P.** *Power Enhancement of Angular Polarizer Spin Torque Oscillator in Magnetic Tunnel Junction*. J. Appl. Phys., **2011**, *109*, 07C714. <http://dx.doi.org/10.1063/1.3554260>

Hsu, H.; **Wentzcovitch, R. M.**; Umemoto, K.; **Cococcioni, M.** *The Hubbard U Correction for Iron-Bearing Minerals: A Discussion Based on (Mg,Fe)SiO₃ Perovskite*. *Phys. Earth & Planet Int.*, **2011**, 185, 13. <http://dx.doi.org/10.1016/j.pepi.2010.12.001>

IRG-3 Publications resulting from PARTIAL MRSEC Support

Chen, Z.*; **Dahlberg, E.D.** *Deformation of Water by a Magnetic Field*. *The Physics Teacher* **2011**, 49, 144-6. <http://dx.doi.org/10.1119/1.3555497> (*University of Minnesota, Undergraduate Research Opportunity Program)

†Belova, L.; **Dahlberg, E.D.**; Riazanova, A.; †Mulders, J.J.L.; Christopherson, C.; Eckert, J. *Rapid Electron Beam Assisted Patterning of Cobalt at Elevated Temperatures Via Seeded Growth*. *Nanotechnology*, **2011**, 22, 145305. <http://dx.doi.org/10.1088/0957-4484/22/14/145305>

Cheng, A.-J.; Manno, M.; Khare, A.; **Leighton, C.**; **Campbell, S.A.**; **Aydil, E.S.** *Imaging and Phase Identification of Cu₂ZnSnS₄ Thin Films Using Confocal Raman Spectroscopy*. *J. Vac. Sci. Technol.*, **2011**, A 29, 051203. <http://dx.doi.org/10.1116/1.3625249> (Cross referenced under **IRG-4**)

Liao, K.K.-H.; Mittal, A.; Bose, S.; **Leighton, C.**; **Mkhoyan, K.A.**; **Macosko, C.W.** *Aqueous Only Route to Graphene from Graphite Oxide*. *ACS Nano*, **2011**, 5, 1253. <http://dx.doi.org/10.1021/nn1028967> (Cross referenced under **IRG-1, IRG-4**)

Rahman, M.T.; Wang, H.; **Wang, J.-P.** *Exploration of the Direct Use of Anodized Alumina as a Mold for Nanoimprint Lithography to Fabricate Magnetic Nanostructure over Large Area*. *Journal of Nanotechnology*, **2011**, 961630. <http://dx.doi.org/10.1155/2011/961630>

Rahman, M.T.; Lyle, A.P.; Hu, G.; Gallagher, W.J.; **Wang, J.-P.** *High Temperature Annealing Stability of Magnetic Properties in MgO-based Perpendicular Magnetic Tunnel Junction Stacks with CoFeB Polarizing Layer*. *J. Appl. Phys.*, **2011**, 109, 07C709. <http://dx.doi.org/10.1063/1.3549605>

Ji, N.; Osofsky, V.; Lauter, V.; Allard, L.F.; Ambaye, H.; Lara-Curzio, E.; Li, X.; Jensen, K.; **Wang, J.-P.** *Perpendicular Magnetic Anisotropy and High Spin Polarization Ratio in Epitaxial Fe-N Thin Films*. *Phys. Rev. B*, **2011**, 84, 245310. <http://dx.doi.org/10.1103/PhysRevB.84.245310>

Wang, H.; Rahman, M.T.; Zhao, H.; †Isowaki, Y.; †Kamata, Y.; †Kikitsu, A.; **Wang, J.-P.** *Fabrication of FePt Type Exchange Coupled Composite Bit Patterned Media by Block Copolymer Lithography*. *J. Appl. Phys.*, **2011**, 109, 07B754. <http://dx.doi.org/10.1063/1.3562453> (Isowaki, Y.; Kamata, Y.; Kikitsu, A, International collaborators from Toshiba Central Research Lab)

Zhao, H.; Lyle, A.P.; Zhang, Y.; Amiri, P.K.; Rowlands, G.; Zeng, Z.; Katine, J.; Jiang, H.; Galatsis, K.; Wang, K.L.; Krivorotov, I.N.; **Wang, J.-P.** *Low Writing Energy and Sub Nano-Second Spin Torque Transfer Switching of in-plane Magnetic Tunnel Junction for STT-RAM*. *J. Appl. Phys.*, **2011**, 109, 07C720. <http://dx.doi.org/10.1063/1.3556784>

Zhao, H.; *Glass, B.; Amiri, P.K.; Lyle, A.P.; Zhang, Y.; Chen, Y.-J.; Rowlands, G.; Upadhyaya, P.; Zeng, Z.; Katine, J.; Langer, J.; Galatsis, K.; Jiang, H.; Wang, K.L.; Krivorotov, I.N.; **Wang, J.-P.** *Sub-200 ps Spin Transfer Torque Switching in In-Plane Magnetic Tunnel Junctions with Interface Perpendicular Anisotropy*. J. Phys. D: Appl. Phys., **2012**, *45*, 025001. <http://dx.doi.org/10.1088/0022-3727/45/2/025001> (*Glass, B. is undergraduate at Physics Department, University of Minnesota)

Publications resulting from IRG-3 research, but do not acknowledge the MRSEC award

†Carmona-Rodriguez, J.; †Lozada-Morales, R.; †del Angel-Vicente, P.; †Jimenez-Sandoval, O.; †Lopez-Calzada, G.; **Dahlberg, E.D.**; †Jimenez-Sandoval, S. *Properties of $Cu_x(CdTe)_yO_z$ Thin Films: Composition-Dependent Control of Band Gap and Charge Transport*. J. Mater. Chem., **2011**, *21*, 13001-13008. <http://dx.doi.org/10.1039/C1JM11734C>

Sung, S.-Y.; Sharma, A.; Block, A.; Keuhn, K.*; **Stadler, B.J.H.** *Magneto-Optical Garnet Waveguides on Semiconductor Platforms: Magnetism, Mechanics, and Photonics*. Journal of Applied Physics, **2011**, *109*, 07B738. <http://dx.doi.org/10.1063/1.3556781> (*MRSEC REU Participant, 2010, University of Wisconsin)

Reddy, S.M.; Park, J.J.; Na, S.-M.; Maqableh, M.M.; Flatau, A.B.; **Stadler, B.J.H.** *Electrochemical Synthesis of Magnetostrictive Fe-Ga/Cu Multilayered Nanowire Arrays with Tailored Magnetic Response*. Advanced Functional Materials, **2011**, *21*, 4677. <http://dx.doi.org/10.1002/adfm.201101390>

Rowlands, G.E.; Rahman, T.; Katine, J.A.; Langer, J.; Lyle, A.; Zhao, H.; Alzate, J.G.; Kovalev, A.A.; Tserkovnyak, Y.; Zeng, Z.M.; Jiang, H.W.; Galatsis, K.; Huai, Y.M.; Amiri, P.K.; Wang, K.L.; Krivorotov, I.N., **Wang, J.P.** *Deep Subnanosecond Spin Torque Switching in Magnetic Tunnel Junctions with Combined In-Plane and Perpendicular Polarizers*. Appl. Phys. Lett., **2011**, *11*, 102509. <http://dx.doi.org/10.1063/1.3565162>

IRG-4 NANOPARTICLE-BASED MATERIALS

IRG-4 Publications resulting from PRIMARY MRSEC Support

Liu, B.; Khare A.; **Aydil, E.S.** *TiO₂-B/Anatase Core-Shell Heterojunction Nanowires for Photocatalysis.* ACS Appl. Mater. Interfaces, **2011**, *3*, 4444-4450. <http://dx.doi.org/10.1021/am201123u>

Liu, B.; **Aydil, E.S.** *Anatase TiO₂ Films with Reactive {001} Facets on Transparent Conductive Substrate.* Chem. Commun., **2011**, *47*, 9507-9509. <http://dx.doi.org/10.1039/c1cc12365c>

Liu, B.; **Aydil, E.S.** *Layered Mesoporous Nanostructures for Enhanced Light Harvesting in Dye-Sensitized Solar Cells.* Journal of Renewable and Sustainable Energy, **2011**, *3*, 043106. <http://dx.doi.org/10.1063/1.3615641>

Jeong, S.H.; Song, S.H.; Nagaich, K.; **Campbell, S.A.**; **Aydil, E.S.** *An Analysis of Temperature Dependent Current–Voltage Characteristics of Cu₂O–ZnO Heterojunction Solar Cells.* Thin Solid Films, **2011**, *519*, 6613-6619. <http://dx.doi.org/10.1016/j.tsf.2011.04.241>

Gresback, R.; Hue, R.; Gladfelter, W.L.; **Kortshagen, U.R.** *Combined Plasma Gas-Phase Synthesis and Colloidal Processing of InP/ZnS Core/Shell Nanocrystals.* Nano. Lett., **2011**, *6*, 68. <http://dx.doi.org/10.1186/1556-276x-6-68>

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