

MRSEC-SUPPORTED PUBLICATIONS AND PATENTS
†Denotes Publications with International Co-Authors

IRG-1 Publications resulting from PRIMARY MRSEC Support

1. Ambwani, P.; Xu, P.; Haugstad, G.; Jeong, J.S.; Deng, R.; Mkhoyan, K.A.; Jalan, B.; Leighton, C. *Defects, stoichiometry, and electronic transport in SrTiO₃-d epilayers: A high pressure oxygen sputter deposition study*. J. of Applied Physics, **2016**, 120, 055704. <http://dx.doi.org/10.1063/1.4960343> **Collaboration with IRG-2. DMR-1420013**
2. Ganguly, K.; Ambwani, P.; Xu, P.; Jeong, J. S.; Mkhoyan, K. A.; Leighton, C.; Jalan, B. *Structure and Transport in High Pressure Oxygen Sputter-Deposited BaSnO_{3-d}*. APL Mat, **2015**, 3, 062509. <http://dx.doi.org/10.1063/1.4919969> **Collaboration with IRG-2. DMR-0819885**
3. Haratipour, N.; Namgung, S.; Grassi, R.; Low, T.; Oh, S.-H.; Koester, S.J. *High-performance black phosphorus MOSFETs using crystal orientation control and contact engineering*. IEEE Elect. Dev. Lett., **2017**, PP issue 99. <http://dx.doi.org/10.1109/LED.2017.2679117> **Collaboration with SEED. DMR-1420013****
4. Haratipour, N.; Namgung, S.; Oh, S.-H.; Koester, S.J. *Fundamental Limits on the Subthreshold Slope in Schottky Source/Drain Black Phosphorus Field-Effect Transistors*. ACS Nano, **2016**, 10, 3791-3800. <http://dx.doi.org/10.1021/acsnano.6b00482> **Collaboration with SEED. DMR-1420013**
5. Jeong, J.S.; Odlyzko, M.L.; Xu, P.; Jalan, B.; Mkhoyan, K.A. *Probing core-electron orbitals by scanning transmission electron microscopy and measuring the delocalization of core-level excitations*. Phys. Rev. B, **2016**, 93, 154, 150. <http://dx.doi.org/10.1103/PhysRevB.93.165140> **Collaboration with IRG-2. DMR-0819885 and 1420013**
6. Jeong, J.S.; Topsakal, M.; Xu, P.; Jalan, B.; Wentzcovitch, R.M.; Mkhoyan, K.A. *A New Line Defect in NdTiO₃ Perovskite*. Nano Lett., **2016**, 16, 6816-6822 <http://www.dx.doi.org/10.1021/acs.nanolett.6b02532> **Collaboration with IRG-2. DMR-0819885 and 1420013**
7. Lin, C.-H.; Polisetty, S.; O'Brien, L.; Baruth, A.; Hillmyer, M.A.; Leighton, C.; Gladfelter, W.G. *Size-tuned ZnO Nanocrucible Arrays for Magnetic Nanodot Synthesis via ALD-assisted Block Polymer Lithography*. ACS Nano, **2015**, 9, 1379. <http://dx.doi.org/10.1021/nn505731n> **Collaboration with IRG-3. DMR-0819885 and 1420013****
8. Nelson, J.; Reich, K.V.; Sammon, M.; Shklovskii, B.I.; Goldman, A.M. *Hopping conduction via ionic liquid induced silicon surface states*. Phys. Rev. B., **2015**, 92, 085424. <http://dx.doi.org/10.1103/PhysRevB.92.085424> **Collaboration with IRG-2. DMR-1420013**
9. Orth, P.P.; Fernandes, R.M.; Walter, J.; Leighton, C.; Shklovskii, B.I. *Percolation via Combined Electrostatic and Chemical Doping in Complex Oxide Films*. Phys Rev Lett., **2017**, 118, 106801. <http://dx.doi.org/10.1103/PhysRevLett.118.106801> **Collaboration with IRG-2. DMR-1420013****
10. Ren, X.; Bruzek, M.J.; Hanifi, D.A.; Schulzetenberg, A.; Wu, Y.; Kim, C.-H.; Zhang, Z.; Johns, J.E.; Salleo, A.; Fratini, S.; Troisi, A.; Douglas, C.J.; Frisbie, C.D. *Negative Isotope Effect on Field-Effect Hole Transport in Fully Substituted ¹³C-Rubrene*. Adv.

Electron. Mater., **2017**, 3, 1700018. <http://dx.doi.org/10.1002/aelm.201700018> **DMR-1420013**

11. Ren, X.; Schmidt, E.; Walter, J.; Ganguly, K.; **Leighton, C.**; **Frisbie, C.D.** *Rubrene Single-Crystal Transistors with Perfluoropolyether Liquid Dielectric: Exploiting Free Dipoles to Induce Charge Carriers at Organic Surfaces*. J. Phys. Chem., **2017**, 121, 6540-6545. <http://dx.doi.org/10.1021/acs.jpcc.7b00743> **DMR-1420013****
12. Robbins, M.C.; **Koester, S.J.** *Black Phosphorus p- and n-MOSFETs With Electrostatically Doped Contacts*. IEEE Electron Device Letters, **2017**, 38, 2. <http://dx.doi.org/10.1109/LED.2016.2638818> **DMR-1420013****
13. Topsakal, M.; **Leighton, C.**; **Wentzcovitch, R.M.** First-principles study of crystal and electronic structure of rare-earth cobaltites. J. of Applied Physics, **2016**, 119, 244310. <http://dx.doi.org/2010.1063/1.4954792> **DMR-0819885 and 1420013**
14. Walter, J.; Wang, H.; Luo, B.; **Frisbie, C.D.**; **Leighton, C.** *Electrostatic versus Electrochemical Doping and Control of Ferromagnetism in Ion-Gel-Gated Ultrathin $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$* . ACS Nano, **2016**, 10, 7799-7810. <http://dx.doi.org/10.1021/acsnano.6b03403> **DMR-1420013**
15. Xie, W.; Zhang, X.; **Leighton, C.**; **Frisbie, C.** *2D Insulator–Metal Transition in Aerosol-Jet-Printed Electrolyte-Gated Indium Oxide Thin Film Transistors*. Advanced Electronic Materials, **2017**, 3, 1600369. <http://dx.doi.org/10.1002/aelm.201600369> **DMR-1420013**
16. Xu, P.; Ayino, Y.; Cheng, C.; **Pribiag, V.S.**; Comes, R.B.; Sushko, P.V.; Chambers, S.A.; **Jalan, B.** *Predictive Control over Charge Density in the Two-Dimensional Electron Gas at the Polar-Nonpolar $\text{NdTiO}_3/\text{SrTiO}_3$ Interface*. Phys. Rev. Lett., **2016**, 117, 106803. <http://dx.doi.org/10.1103/PhysRevLett.117.106803> **Collaboration with SEED. DMR-1420013**
17. Xu, P.; Droubay, T.C.; Jeong, J. S.; **Mkhoyan, K.A.**; Sushko, P. V.; Chambers, S. A.; **Jalan, B.** *Quasi 2D ultra-high carrier density in a complex oxide broken-gap heterojunction*. Adv. Mater. Interfaces, **2016**, 3, 1500432. <http://dx.doi.org/10.1002/admi.201500432> **Collaboration with IRG-2. DMR-0819885 and 1420013**

IRG-1 Publications resulting from PARTIAL MRSEC Support

18. Chambers, S.A.; Kaspar, T.C.; Prakash, A.; **Haugstad, G.**; **Jalan, B.** *Band alignment at epitaxial $\text{BaSnO}_3/\text{SrTiO}_3(001)$ and $\text{BaSnO}_3/\text{LaAlO}_3(001)$ heterojunctions*. Appl. Phys. Lett., **2016**, 108, 152104 <http://dx.doi.org/10.1063/1.4946762> **DMR-1420013**
19. da Silva Neto, E.H.; Yu, B.; Minola, M.; Sutarto, R.; Schierle, E.; Boschini, F.; Zonno, M.; Bluschke, M.; Higgins, J.; Li, Y.; Yu, G.; Weschke, E.; He, F.; Le Tacon, M.; Greene, R.L.; **Greven, M.**; Sawatzky, G.A.; Keimer, B.; Damascelli, A. *Doping-dependent charge order correlations in electron-doped cuprates*. Science Advances, **2016**, 2, e1600782. <http://www.doi.org/10.1126/sciadv.1600782> **DMR-1420013**
20. Deng, B.; Tran, V.; Jiang, H.; Li, C; Xie, Y.; Guo, Q.; Wang, X.; Tian, H. **Koester, S.J.**; Wang, H.; Cha, J.; Xia, Q.; Yang, L.; Xia, F. *Efficient electrical control of thin-film black phosphorus bandgap*. Nat. Commun., **2017**, 8, 14474. <http://dx.doi.org/10.1038/ncomms14474> **DMR-1420013**
21. Johnson, M.; Wrasman, C.*; Zhang, X.; Manno, M.; **Leighton, C.**; **Aydil, E.S.** *Self-regulation of Cu/Sn Ratio in the Synthesis of $\text{Cu}_2\text{ZnSnS}_4$ Films*. Chem. Mater, **2015**, 27, 2507-2514. (**UROP Program and IREE, University of Minnesota*)

<http://dx.doi.org/10.1021/acs.chemmater.5b00108> **Collaboration with IRG-2. DMR-0819885 and 1420013**

22. Kim, K.-W.; O'Brien, L.; **Crowell, P.A.; Leighton, C.**; Stiles, M.D. *Theory of Kondo suppression of spin polarization in nonlocal spin valves*. Phys. Rev. B, **2017**, 95, 104404. <http://dx.doi.org/10.1103/PhysRevB.95.104404> **DMR-1420013**
23. Klemm Smith, A.; Jamali, M.; Stecklein, G.; **Crowell, P.A, Wang, J.-P.** *Non-Local Lateral Spin-Valve Devices Fabricated With a Versatile Top-Down Fabrication Process*. IEEE Magnetics Letters, **2016**, 7, 3103604 <http://dx.doi.org/10.1109/LMAG.2016.2555290> **DMR-0819885**
24. Le, B.L.; Park, J.; Sklenar, J.; Chern, G.-W.; Nisoli, C.; Watts, J.D.; Manno, M.; Rench, D.W.; Samarth, N.; **Leighton, C.**; Schiffer, P. *Understanding magnetotransport signatures in networks of connected permalloy nanowires*. Phys. Rev. B, **2017**, 95, 060405(R). <http://dx.doi.org/10.1103/PhysRevB.95.060405> **DMR-1420013**
25. Li, Y.; Tabis, W.; Yu, G.; Barišić, N.; **Greven, M.** *Hidden Fermi-liquid Charge Transport in the Antiferromagnetic Phase of the Electron-Doped Cuprate Superconductors*. Physical Review Letters, **2016**, 117, 197001. <http://dx.doi.org/10.1103/PhysRevLett.117.197001> **DMR-1420013**
26. Namgung, S.; Shaver, J.; **Oh, S.-H.; Koester, S.J.** *Multimodal photodiode and phototransistor device based on two-dimensional materials*. ACS Nano, **2016**, 10, 10500-10506. <http://dx.doi.org/10.1021/acs.nano.6b06468> **DMR-1420013**
27. O'Brien, L.; Spivak, D.; Jeong, J.S.; **Mkhoyan, K.A.; Crowell, P.A.; Leighton C.** *Interdiffusion-controlled Kondo suppression of injection efficiency in metallic nonlocal spin valves*, Phys. Rev. B, **2016**, 93, 14413. <http://dx.doi.org/10.1103/PhysRevB.93.014413> **Collaboration with IRG-2. DMR-0819885 and 1420013**
28. O'Brien, L.; Spivak, D.; Krueger, N.; Peterson, T.A.; Erickson, M.J.; Bolon, B.; Geppert, C.C.; **Leighton, C.; Crowell, P.A.** *Observation and modelling of ferromagnetic contact-induced spin relaxation in Hanle spin precession measurements*. Phys. Rev. B, **2016**, 94, 094431. <http://dx.doi.org/10.1103/PhysRevB.94.094431> **DMR-1420013**
29. Ozcelik, V.O.; Azadani, J.G.; Yang, C.; **Koester, S.J.; Low, T.** *Band alignment of two-dimensional semiconductors for designing heterostructures with momentum space matching*. Phys. Rev. B. **2016**, 94, 035125. <http://dx.doi.org/10.1103/PhysRevB.94.035125> **DMR-1420013**
30. Perez-Munoz, A.M.; Schio, P.; Poloni, R.; Fernandez-Martinez, A.; Rivera-Calzada, A.; Cezar, J.C.; Salas-Colera, E.; Castro, G.R.; Kinney J.; Leon, C.; Santamaria, J.; Garcia-Barriocanal, J.; **Goldman, A.M.** *In operando evidence of deoxygenation in ionic liquid gating of $YBa_2Cu_3O_{7-x}$* . PNAS, **2017**, 114, 215220. <http://dx.doi.org/10.1073/pnas.1613006114> **DMR-1420013**
31. Peterson, T.A.; Patel, S.J.; Geppert, C.C.; Christie, K.D.; Rath, A.; Pennachio, D.; Flatté, M.E.; Voyles, P.M.; **Palmstrøm, C.J.; Crowell P.A.** *Spin injection and detection up to room temperature in Heusler alloy/n-GaAs spin valves*. Phys. Rev. B, **2016**, 94, 235309. <http://dx.doi.org/10.1103/PhysRevB.94.235309> **DMR-1420013**
32. Prakash, A.; Dewey, J.; Yun, H.; Jeong, J. S.; **Mkhoyan, K.A.; Jalan, B.** *Hybrid molecular beam epitaxy growth for stoichiometric $BaSnO_3$* . J. Vac. Sci. Technol. A, **2015**, 33, 060608. <http://dx.doi.org/10.1116/1.4933401> **Collaboration with IRG-2. DMR-1420013**

33. Prakash, A.; Xu, P.; Wu, X.; **Haugstad, G.**; **Wang, X.**; **Jalan, B.** *Adsorption-controlled growth and the influence of stoichiometry on electronic transport in hybrid molecular beam epitaxy-grown BaSnO₃ films.* J. Mater. Chem. C, **2017**, Advance Article. <http://dx.doi.org/10.1039/C7TC00190H> **Collaboration with Seed. DMR-1420013**
34. Robbins, M.C.; Namgung, S.; **Oh, S.-H.**; **Koester, S.J.** *Cyclical thinning of black phosphorus with high spatial resolution for heterostructure devices.* ACS Appl. Mater. Interfaces, **2017**, 9, 12654-12662. <http://dx.doi.org/10.1021/acsami.6b14477> **DMR-1420013**
35. Wu, R.J.; Topsakal, M.; **Low, T.**; Robbins, M.C.; Haratipour, N.; Jeong, J.S.; **Wentzcovitch, R.**; **Koester, S.J.**; **Mkhoyan, K.A.** *Atomic and Electronic Structure of Exfoliated Black Phosphorous.* J. Vac. Sci. Technol. A, **2015**, 33, 060604. <http://dx.doi.org/10.1116/1.4926753> **Collaboration with IRG-2. DMR-0819885**
36. Zhang, X.; Scott, T.; Socha, T.*; Nielsen, D.*; Manno, M., Johnson, M.; Yan, Y.*; Losovyj, Y.; Dowben, P.; **Aydil, E.S.**; **Leighton, C.** *Phase Stability and Stoichiometry in Thin Film Pyrite: Impact on Electronic Transport Properties.* ACS Appl. Mater. Int., **2015**, 7, 14130-14139. (*Undergraduate, University of Minnesota) <http://dx.doi.org/10.1021/acsami.5b03422> **Collaboration with IRG-2. DMR-0819885 and 1420013**
37. Zink, B.L.; Manno, M.; O'Brien, L.; Lotze, J.; Weiler, M.; Bassett, D.; Mason, J.; Goennenwein, S.T.B.; Johnson, M.; **Leighton, C.** *Efficient spin transport through native oxides of nickel and permalloy with platinum and gold overlayers.* Phys. Rev. B, **2016**, 93, 184401. <http://dx.doi.org/10.1103/PhysRevB.93.184401> **DMR-1420013**

IRG-1 Publications resulting from the USE OF SHARED FACILITIES

38. Arezoomandan, S.; Quispe, H.C.; Chanana, A.; Xu, P.; Nahata, A.; **Jalan, B.**; Sensale-Rodriguez, B. *Large nanoscale electronic conductivity in complex oxide heterostructures with ultra high electron density.* APL Materials, **2016**, 4, 076107. <http://dx.doi.org/10.1063/1.4959284> **UMN MRSEC Program**
39. Bretz-Sullivan, T.M.; **Goldman, A.M.** *Magnetic field tuned reentrant superconductivity in out-of-equilibrium aluminum nanowires.* Phys. Rev. B, **2016**, 93, 184509. <http://dx.doi.org/10.1103/PhysRevB.93.184509> **DMR-1420013**
40. Demissie, A.T.; **Haugstad, G.**; **Frisbie, C.D.** *Quantitative Surface Coverage Measurements of Self-Assembled Monolayers by Nuclear Reaction Analysis of Carbon-12.* J. Phys. Chem. Lett., **2016**, 7, 3477-3481. <http://dx.doi.org/10.121/acs.6b01363> **DMR-1420013**
41. El-Khatib, S.; Phelan, D.; Barker, J.G.; Zheng, H.; Mitchell, J.F.; **Leighton, C.** *Neutron-scattering-based evidence for interacting magnetic excitons in LaCoO₃.* Phys. Rev. B, **2015**, 92, 060404. <http://dx.doi.org/10.1103/PhysRevB.92.060404> **DMR-1420013**
42. Joung, D.; Nemilentsau, A.; Agarwal, K.; Dai, C.; Liu, C.; Su, Q.; Li, J.; **Low, T.**; **Koester, S.**; Cho, J.-H. *Self-Assembled Three-Dimensional Graphene-Based Polyhedrons Inducing Volumetric Light Confinement.* Nano Lett., **2017**, 17, 1987-1994. <http://dx.doi.org/10.1021/acs.nanolett.6b05412> **DMR-1420013**
43. Kshirsager, C.U.; Xu, W.; Su, Y.; Robbins, M.C.; Kim, C.H.; **Koester, S.J.** *Dynamic memory cells using MoS₂ field-effect transistors demonstrating femtoampere leakage currents.* ACS Nano, **2016**, 10, 8457-8464. <http://dx.doi.org/10.1021/acsnano.6b03440> **DMR-1420013**

44. Li, Y.; Chaganti, V.R.S.K.; Reynolds, M.A.; Gerbi, B.J.; **Koester, S.J.** *Demonstration of a passive wireless radiation detector using fully-depleted silicon-on-insulator varactors.* IEEE Trans. Nucl. Sci., **2017**, 64, 544-549. <http://ieeexplore.ieee.org/document/7728077/>
45. Sangeeth, C.S.S.; Demissie, A.T.; Yuan, L.; Wang, T.; **Frisbie, C.D.**; Nijhuis, C.A. *Comparison of DC and AC Transport in 1.5-7.5 nm Oligophenylene (mine Molecular Wires across Two Junction Platforms: Eutectic Ga-In versus Conducting Probe Atomic Force Microscope Junctions.* J. Am. Chem. Soc., **2016**, 138, 7305-7314. <http://dx.doi.org/10.1021/jacs.6b02039> **DMR-1420013**
46. Stecklein, G.; **Crowell, P.A.**; Li, J., Anugrah, Y.; Su, Q.; **Koester, S.J.** *Contact-Induced Spin Relaxation in Graphene Nonlocal Spin Valves.* Phys. Rev. Applied, **2016**, 6, 054015. <http://dx.doi.org/10.1103/PhysRevApplied> **DMR-1420013**
47. Taherinia, D.; **Frisbie, C.D.** *Photoswitchable Hopping Transport in Molecular Wires 4 nm in Length.* Jour. Phys. Chem. C, **2016**, 120, 6442-6449. <http://dx.doi.org/10.1021/acs.jpcc.6b00925> **DMR-1420013**
48. Wang, T.; Pitike, K.C.; Yuan, Y.; Nakhmanson, M.; Gopalan, V.; **Jalan, B.** *Chemistry, growth kinetics, and epitaxial stabilization of Sn²⁺ in Sn-doped SrTiO₃ using (CH₃)₆Sn₂ tin precursor.* APL Mats., **2016**, 4, 126111. <http://dx.doi.org/10.1063/1.4972995> **Collaboration with Seed. UMN MRSEC Program**

IRG-2 Publications resulting from PRIMARY MRSEC Support

49. Chernomordik B. D.; Ketkar, P. M.; Hunter, A. K.; Béland, A. E.; Deng, D. D.; **Aydil, E. S.** *Microstructure Evolution During Selenization of Cu₂ZnSnS₄ Colloidal Nanocrystal Coatings.* Chem. Mater., **2016**, 28, 1266-1276. <http://dx.doi.org/10.1021/acs.chemmater.5b02462> **DMR-1420013**
50. Declet-Perez, C.; **Francis, L.F.**; **Bates, F.S.** *Deformation Processes in Block Copolymer Toughened Epoxy.* Macromolecules, **2015**, 48, 3672–3684. <http://dx.doi.org/10.1021/acs.macromol.5b00243> **Collaboration with IRG-3. DMR-0819885****
51. Fu, H.; Reich, K. V.; **Shklovskii, B. I.** *Anomalous conductivity, Hall factor, magnetoresistance, and thermopower of accumulation layer in SrTiO₃.* Phys. Rev. B, **2016**, 94, 045310. <http://dx.doi.org/10.1103/PhysRevB.94.045310> **DMR-1420013****
52. Fu, H.; Reich, K. V.; **Shklovskii, B. I.** *Electron gas induced in SrTiO₃.* JETP, **2016**, 122, 456–471. <http://dx.doi.org/10.1134/S1063776116030055> **DMR-1420013****
53. Fu, H.; Reich, K. V.; **Shklovskii, B. I.** *Hopping conductivity and insulator-metal transition in films of touching semiconductor nanocrystals.* Phys. Rev. B, **2016**, 93, 125430. <http://dx.doi.org/10.1103/PhysRevB.93.125430> **DMR-1420013****
54. Fu, H.; Reich, K. V.; **Shklovskii, B. I.** *Surface roughness scattering in multisubband accumulation layers.* Phys. Rev. B, **2016**, 93, 235312. <http://dx.doi.org/10.1103/PhysRevB.93.235312> **DMR-1420013****
55. Fu, H.; Reich, K. V.; **Shklovskii, B.I.** *Collapse of electrons to a donor cluster in SrTiO₃.* Phys Rev. B, **2015**, 92, 035204. <http://dx.doi.org/10.1103/PhysRevB.92.035204> **DMR-1420013****

56. Held, J.T.; Duncan, S.; **Mkhoyan, K.A.** *Effects of small-angle mistilts on dopant visibility in ADF-STEM imaging of nanocrystals.* Ultramicroscopy, **2017**, 177, 53. <http://dx.doi.org/10.1016/j.ultramic.2017.03.008> **DMR-1420013**
57. Hunter, K.I.; Held, J.T.; **Mkhoyan, K.A.**; **Kortshagen, U.R.** *Nonthermal Plasma Synthesis of Core/Shell Quantum Dots: Strained Ge/Si Nanocrystals.* ACS Appl. Mater. Interfaces, **2017**, 9, 8263-8270. <http://dx.doi.org/10.1021/acsami.6b16170> **DMR-0819885 and 1420013**
58. Jeon, S.; Oberreit, D.R.; Van Schooneveld, G.; Gao, Z.; Bischof, J.C.; **Haynes, C.L.**; **Hogan, C.J.** *Ion-Mobility-Based Quantification of Surface-Coating-Dependent Binding of Serum Albumin to Superparamagnetic Iron Oxide Nanoparticles.* ACS Applied Materials & Interfaces, **2016**, 8, 24482–24490. <http://dx.doi.org/10.1021/acsami.6b09070> **DMR-1420013**
59. Jeong, J.S.; **Mkhoyan, K.A.** *Improving Signal-to-Noise Ratio in Scanning Transmission Electron Microscopy Energy-Dispersive X-Ray (STEM-EDX) Spectrum Images Using Single-Atomic-Column Cross-Correlation Averaging.* Microscopy and Microanalysis, **2016**, 22, 536-543. <http://dx.doi.org/10.1017/S1431927616000635> **DMR-1420013****
60. **Kortshagen, U.R.**; Sankaran, R.M.; Pereira, R.N.; Girshick, S.L.; Wu, J.J.; **Aydil, E.S.** *Nonthermal Plasma Synthesis of Nanocrystals: Fundamental Principles, Materials, and Applications.* Chem. Rev., **2016**, 116, 11061-11127. <http://dx.doi.org/10.1021/acs.chemrev.6b00039> **DMR-1420013**
61. Li, T.; Heinzer, M.J.; **Francis, L.F.**; **Bates, F.S.** *Engineering Superior Toughness in Commercially Viable Block Copolymer Modified Epoxy Resin.* J. Polym. Sci. Part B, **2016**, 54, 189-204. <http://dx.doi.org/10.1002/polb.23894> **Collaboration with IRG-3. DMR-1420013**
62. Li, T.; Zhang, J.; Schneiderman, D.K.; **Francis, L.F.**; **Bates, F.S.** *Toughening Glassy Poly(lactide) with Block Copolymer Micelles.* ACS Macro Lett., **2016**, 5, 359-364. <http://dx.doi.org/10.1021/acsmacrolett.6b00063> **Collaboration with IRG-3. DMR-1420013**
63. Odlyzko, M.L.; Held, J.T.; **Mkhoyan, K.A.** *Atomic bonding effects in annular dark field scanning transmission electron microscopy. II. Experiments.* J. Vac. Sci. Technol. A, **2016**, 34, 041603. <http://dx.doi.org/10.1116/1.4954877> **DMR-1420013**
64. Odlyzko, M.L.; Himmetoglu, B.; Cococcioni, M.; **Mkhoyan, K.A.** *Atomic bonding effects in annular dark field scanning transmission electron microscopy. I. Computational Predictions.* J. Vac. Sci. Technol. A, **2016**, 34, 041602. <http://dx.doi.org/10.1116/1.4954871> **DMR-1420013**
65. Reich, K. V.; **Shklovskii, B. I.** *Dielectric constant and charging energy in array of touching nanocrystals.* Appl. Phys. Lett., **2016**, 108, 113104. <http://dx.doi.org/10.1063/1.4944407> **DMR-1420013****
66. Reich, K.V.; **Shklovskii, B.I.** *Exciton Transfer in Array of Epitaxially Connected Nanocrystals.* ACS Nano, **2016**, 10, 10267-10274. <http://www.dx.doi.org/10.1021/acsnano.6b05846> **DMR-1420013****
67. Williams, B. A.; Smeaton, M. A.; Holgate, C. S.; Trejo, N. D.; **Francis L. F.**; **Aydil, E. S.** *Intense Pulsed Light Annealing of Copper Zinc Tin Sulfide Nanocrystal Coatings.* J. Vac. Sci. Technol. A, **2016**, 34, 151204. <http://dx.doi.org/10.1116/1.4961661> **DMR-1420013****

68. Williams, B.A.; Smeaton, M.A.; Trejo, N.D.; **Francis, L.**; **Aydil, E.S.** *Effect of Nanocrystal Size and Carbon on Grain Growth during Annealing of Copper Zinc Tin Sulfide Nanocrystal Coatings*. *Chem. Mater.*, **2017**, 29, 1676-1683.
<http://dx.doi.org/10.1021/acs.chemmater.6b05058> **DMR-1420013****

IRG-2 Publications resulting from PARTIAL MRSEC Support

69. Bilik, N.; Greenberg, B.L.; Yang, E.S.; Yang, J.; **Aydil, ES.**; **Kortshagen, U.R.** *Atmospheric-pressure glow plasma synthesis of plasmonic and photoluminescent zinc oxide nanocrystals*. *J. of Applied Physics*, **2016**, 199, 243302.
<http://dx.doi.org/10.1063/1.4954323> **DMR-1420013**
70. Botas, A.; Brites, C.; Carlos, L.D.; Ferreira, R.; **Kortshagen, U.**; Pereira, R.; Wu, J. *A New Generation of Primary Luminescent Thermometers Based on Silicon Nanoparticles and Operating in Different Media*. *Part. Part. Syst. Charact.*, **2017**, 33, 740-748.
<http://dx.doi.org/10.1002/ppsc.201600198> **DMR-1420013**
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83. Jeon, M.Y.; Kim, D.; Kumar, P. ; Lee, P. S.; Rangnekar, N.; Bai, P.; Shete, M.; Elyassi, B.; Lee, H.S.; Narasimharao, K.; Basahel, S.N.; Al-Thabaiti, S.; Xu, W.; Cho, H.J.; Fetisov, E.O.; Thyagarajan, R.; DeJaco, R.F.; Fan, W.; **Mkhoyan, K.A.**; **Siepmann, J.I.**; Tsapatsis, M. *Ultra-selective high-flux membranes from directly synthesized zeolite nanosheets*. *Nature*, **2017**, 543, 690. <http://dx.doi.org/10.1038/nature21421>
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102. Zheng, J.; Jung, S.; Schmidt, P.W.; **Lodge, T.P.**; **Reineke, T.M.** *2-Hydroxyethylcellulose and Amphiphilic Block Polymer Conjugates Form Mechanically Tunable and Nonswellable Hydrogels*. ACS Macro Letters, **2017**, 6, 145-149.
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118. Johnson, L.M.; Li, Z.; LaBelle, A.J.; **Bates, F.S.**; **Lodge, T.P.**; **Hillmyer, M.** *Impact of Polymer Excipient Molar Mass and End Groups on Hydrophobic Drug Solubility Enhancement*. Macromolecules, **2017**, 50, 1102-1112.
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133. Wang, Z.F.; Liu, X.T.; Macosko, C.W.; **Bates, F.S.** *Nanofibers from water-extractable melt-blown immiscible polymer blends*. *Polymer*, **2016**, 101, 269-273.
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