

## 15. MRSEC-Supported Publications, Patents, and Presentations, Period 5

†Denotes publications with international co-authors

**Bolded names denote MRSEC primary participants**

**\*Denotes 100% MRSEC-supported**

**\*\*Denotes REU/RET/PREM participant co-author**

### IRG-1 Publications Resulting from PRIMARY MRSEC Support

1. Chakraborty, R.D.; Liang, J.; Fasasi, T.A.; **Stoerzinger, K.A.**; **Leighton, C.**; **Ferry, V.E.**; *High metal–insulator topotactic cycling endurance in electrochemically gated  $\text{La}_{0.5}\text{Sr}_{0.5}\text{CoO}_{3-\delta}$  probed by humidity-dependent operando Fourier transform infrared spectroscopy.* ACS Nano, **2025**. DOI: [10.1021/acsnano.5c01256](https://doi.org/10.1021/acsnano.5c01256) **DMR-2011401\***
2. Chakraborty, R.D.; **Leighton, C.**; **Ferry, V.E.** *Large near-infrared refractive index modulation in ion-gel-gated  $\text{BaSnO}_3$  for active metasurfaces.* ACS Appl. Opt. Mater., **2025**. DOI: [10.1021/acsaom.5c00110](https://doi.org/10.1021/acsaom.5c00110) **DMR-2011401\***
3. Day-Roberts, E.; **Fernandes, R.M.**; **Birol, T.** *Piezoresistivity as a fingerprint of ferroaxial transitions.* Phys. Rev. Lett., **2025**, 134, 016401. DOI: [10.1103/PhysRevLett.134.016401](https://doi.org/10.1103/PhysRevLett.134.016401) **DMR-2011401**

### IRG-1 Publications Resulting from PARTIAL MRSEC Support

4. Xu, X.; Zhang, C.; Guo, S.; Seaton, C.A.; **Mkhoyan, K.A.**; Roth, J.; Gong, J.; Zheng, X.; Zuckerman, N.; **Wang, X.** *Thermal performance of materials for heat-assisted magnetic recording.* J. Appl. Phys., **2025**, 137, 125111. DOI: [10.1063/5.0258288](https://doi.org/10.1063/5.0258288) **DMR-2011401**
5. Yang, Y.; Nair, S.; Fan, Y.; Chen, Y.C.; Jia, .; Benally, O.J.; Lee, S.; Jeong, S.G.; Yang, Z.; **Low, T.**; **Jalan, B.**; **Wang, J.-P.** *Coexistence of unconventional spin Hall effect and antisymmetric planar Hall effect in  $\text{IrO}_2$ .* Appl. Phys. Lett., **2025**, 126, 102403. DOI: [10.1063/5.0240538](https://doi.org/10.1063/5.0240538) **Collaboration with Seed, DMR-2011401**
6. Choudhary, R.; **Jalan, B.** *Atomically precise synthesis of oxides with hybrid molecular beam epitaxy.* Device, **2025**, 3, 100711. DOI: [10.1016/j.device.2025.100711](https://doi.org/10.1016/j.device.2025.100711) **DMR-2011401**
7. Ghosh, S.; Liu, F.; Nair, S.; Raj, R.; **Jalan, B.**; **Mkhoyan, K.A.** *Site-specific plan-view (S)TEM sample preparation from thin films using a dual-beam FIB-SEM.* Ultramicroscopy, **2025**, 270, 114104. DOI: [10.1016/j.ultramicro.2025.114104](https://doi.org/10.1016/j.ultramicro.2025.114104) **DMR-2011401**
8. †Cho, K.G.; Kim, S.J.; Park, D.H.; Kim, M.S.; Hong, K.; Lee, K.H.; **Frisbie, C.D.** *Band filling, electrochemical reaction, and re-entrant insulating behavior in electrolyte-gated BBL polymer semiconductor films.* ACS Appl. Mater. Interfaces, **2025**, 17, 15718-15727. DOI: [10.1021/acsami.4c22852](https://doi.org/10.1021/acsami.4c22852) **DMR-2011401**
9. †Shin, Y.; Liang, J.; Yu, G.; **Leighton, C.**; Galli, G. *Role of hidden grenier phases in topotactic phase transitions in  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_{3-\delta}$ .* ACS Appl. Mater. Interfaces, **2025**, 17, 15603-15612. DOI: [10.1021/acsami.4c21094](https://doi.org/10.1021/acsami.4c21094) **DMR-2011401**
10. Liu, F.; Szymanski, N.J.; Noordhoek, K.; Shin, H.-s.; Kim, D.; **Bartel, C.**; **Jalan, B.** *Unraveling the growth dynamics of rutile  $\text{Sn}_{1-x}\text{Ge}_x\text{O}_2$  using theory and experiment.* Nano Lett., **2024**, 25, 299-305. DOI: [10.1021/acs.nanolett.4c05043](https://doi.org/10.1021/acs.nanolett.4c05043) **DMR-2011401**

11. Sen, D.; Ravichandran, H.; Das, M.; Venkatram, P.; Choo, S.; Varshney, S.; Zhang, Z.; Sun, Y.; Shah, J.; Radhakrishnan, S.S.; Saha, A.; Hazra, S.; Chen, C.; Redwing, J.M.; **Mkhoyan, K.A.**; Gopalan, V.; Yang, Y.; **Jalan, B.**; Das, S. *Multifunctional 2D FETs exploiting incipient ferroelectricity in freestanding SrTiO<sub>3</sub> nanomembranes at sub-ambient temperatures*. Nat. Commun., **2024**, *15*, 10739. DOI: [10.1038/s41467-024-54231-z](https://doi.org/10.1038/s41467-024-54231-z) **DMR-2011401**
12. Wang, L.; Yang, Z.; Koirala, K.P.; Bowden, M.E.; Freeland, J.W.; Sushko, P.V.; Kuo, C.-T.; Chambers, S.A.; Wang, C.; **Jalan, B.**; Du, Y. *Interfacial charge transfer and its impact on transport properties of LaNiO<sub>3</sub>/LaFeO<sub>3</sub> superlattices*. Sci. Adv., **2024**, *10*, eadq6687. DOI: [10.1126/sciadv.adq6687](https://doi.org/10.1126/sciadv.adq6687) **DMR-2011401**
13. Liu, F.; Yang, Z.; Abramovitch, D.; Guo, S.; **Mkhoyan, K.A.**; Bernardi, M.; **Jalan, B.** *Deep-ultraviolet transparent conducting SrSnO<sub>3</sub> via heterostructure design*. Sci. Adv., **2024**, *10*, eadq7892. DOI: [10.1126/sciadv.adq7892](https://doi.org/10.1126/sciadv.adq7892) **DMR-2011401**
14. Rajapitamahuni, A.K.; Nair, S.T.; Yang, Z.; Kamath Manjeshwar, A.; Jeong, S.; Nunn, W.T.; **Jalan, B.** *Thickness-dependent insulator-to-metal transition in epitaxial RuO<sub>2</sub> films*. Phys. Rev. Mater., **2024**, *8*, 075002. DOI: [10.1103/physrevmaterials.8.075002](https://doi.org/10.1103/physrevmaterials.8.075002) **DMR-2011401**
15. Nair, S.; Yang, Z.; Storr, K.; **Jalan, B.** *High-mobility carriers in epitaxial IrO<sub>2</sub> films grown using hybrid molecular beam epitaxy*. Nano Lett., **2024**, *24*, 10850-10857. DOI: [10.1021/acs.nanolett.4c02367](https://doi.org/10.1021/acs.nanolett.4c02367) **DMR-2011401**
16. Yun, H.; Lyu, D.; LV, Y.; Zink, B.R.; Khanal, P.; Zhou, B.; Wang, W.; **Wang, J.P.**; **Mkhoyan, K.A.** *Uncovering atomic migrations behind magnetic tunnel junction breakdown*. ACS Nano, **2024**, *18*, 25708-25715. DOI: [10.1021/acsnano.4c08023](https://doi.org/10.1021/acsnano.4c08023) **Collaboration with Seed. DMR-2011401**
17. Ghosh, S.; **Mkhoyan, K.A.** *Quantifying patterned features on material surfaces created using Ga Ion Beam in FIB-SEM*. Microsc. Microanal., **2025**, *31*, ozaf001. DOI: [10.1093/mam/ozaf001](https://doi.org/10.1093/mam/ozaf001) **DMR-2011401**

#### IRG-2 Publications Resulting from PRIMARY MRSEC Support

18. Cui, S.; Murphy, E.A.; Santra, S.; **Bates, F.S.**; **Lodge, T.P.** *Mesoscopic morphologies in frustrated ABC bottlebrush block terpolymers*. ACS Nano, **2025**, *19*, 1211-1221. DOI: [10.1021/acsnano.4c13416](https://doi.org/10.1021/acsnano.4c13416) **DMR-2011401**
19. **Dorfman, K.D.** *Computational phase discovery in block polymers*. ACS Macro Lett., **2024**, *13*, 1612-1619. DOI: [10.1021/acsmacrolett.4c00661](https://doi.org/10.1021/acsmacrolett.4c00661) **DMR-2011401\***
20. McGuinness, E.K.; Magruder, B.R.; **Dorfman, K.D.**; **Ellison, C.J.**; **Ferry, V.E.** *Circular dichroism of distorted double gyroid thin film metamaterials*. Phys. Rev. Mater., **2024**, *8*, 115201. DOI: [10.1103/PhysRevMaterials.8.115201](https://doi.org/10.1103/PhysRevMaterials.8.115201) **DMR-2011401\***
21. Magruder, B.R.; **Ellison, C.J.**; **Dorfman, K.D.** *Equilibrium phase behavior of gyroid-forming diblock polymer thin films*. J. Chem. Phys., **2024**, *161*, 084902. DOI: [10.1063/5.0224767](https://doi.org/10.1063/5.0224767) **DMR-2011401\***

#### IRG-2 Publications Resulting from PARTIAL MRSEC Support

22. Ness, E.M.; Kozody, M.J.\*\*; **Ellison, C.J.**; **Mahanthappa, M.K.** *Effect of grafting density on self-assembled lamellar phases of core-shell bottlebrushes*. Macromolecules, **2025**, *58*, 3016-3026. DOI: [10.1021/acs.macromol.4c03191](https://doi.org/10.1021/acs.macromol.4c03191) **DMR-2011401, DMR-1852044\*\***
23. Neal, C.A.P.; Shetty, A.M.; Linn, J.D.; Quan, M.C.; Casas, J.D.\*\*; **Calabrese, M.A.** *Magnetic field-dependent rheological behavior of thermoresponsive poly(*N*-isopropylacrylamide) solutions*. Rheol. Acta, **2024**, *63*, 493-512. DOI: [10.1007/s00397-024-01454-y](https://doi.org/10.1007/s00397-024-01454-y) **DMR-2011401, DMR-2122178\*\***
24. Liu, S.S.; White, J.M.; Chao, Z.; Li, R.; Wen, S.; Garza, A.; Tang, W.; MA, X.; Chen, P.; Daniel, S.; **Bates, F.S.**; Yeo, J.; **Calabrese, M.A.**; Yang, R. *A pseudo-surfactant chemical permeation enhancer to treat otitis media via sustained transtympanic delivery of antibiotics*. Adv. Healthcare Mater., **2024**, *13*, 2400457. DOI: [10.1002/adhm.202400457](https://doi.org/10.1002/adhm.202400457) **DMR-2011401, DMR-2122178\*\***

### Seed Publications Resulting from PRIMARY MRSEC Support

25. Aydoğan, K.; Schlimgen, A.W.; **Head-Marsden, K.** *Stabilizing steady-state properties of open quantum systems with parameter engineering*. Phys. Rev. Res., **2025**, 7, 023057. DOI: [10.1103/PhysRevResearch.7.023057](https://doi.org/10.1103/PhysRevResearch.7.023057) **DMR-2011401**
26. Hosford, B.M.; Ramos, W.; **Lamb, J.R.** *Combining photocontrolled-cationic and anionic-group-transfer polymerizations using a universal mediator: enabling access to two- and three-mechanism block copolymers*. Chem. Sci., **2024**, 15, 13523-13530. DOI: [10.1039/d4sc02511c](https://doi.org/10.1039/d4sc02511c) **DMR-2011401**
27. Christenson, G.N.; Yu, Z.; **Frontiera, R.R.** *Wavelength dependence of plasmon-induced vibrational energy transfer in fluorophore-plasmonic systems*. J. Phys. Chem. C, **2024**, 128, 10784-10789. DOI: [10.1021/acs.jpcc.4c01142](https://doi.org/10.1021/acs.jpcc.4c01142) **DMR-2011401**

### Seed Publications Resulting from PARTIAL MRSEC Support

28. Liu, Y.; **Holmes, R.J.** *Continuously tuning strong exciton-photon coupling via molecular orientation in organic microcavities*. Adv. Opt. Mater. **2025**, 13, 2403135. DOI: [10.1002/adom.202403135](https://doi.org/10.1002/adom.202403135) **DMR-2011401**
29. Willis, S.; **Flannigan, D.J.** *Influence of photoemission geometry on timing and efficiency in 4D ultrafast electron microscopy*. ChemPhysChem, **2025**, 26, e202401032. DOI: [10.1002/cphc.202401032](https://doi.org/10.1002/cphc.202401032) **DMR-2011401**
30. †Stefancu, A.; Aizpurua, J.; Alessandri, I.; Bald, I.; Baumberg, J.J.; Besteiro, L.V.; Christopher, P.; Correa-Duarte, M.; de Nijs, B.; Demetriadou, A.; **Frontiera, R.R.** et al. *Impact of surface enhanced Raman Spectroscopy in Catalysis*. ACS Nano, **2024**, 18, 29337-29379. DOI: [10.1021/acsnano.4c06192](https://doi.org/10.1021/acsnano.4c06192) **DMR-2011401**
31. Fan, Y.; Cresswell, Z.; Yang, Y.; Jiang, W.; Lv, Y.; Peterson, T.J.; Zhang, D.; Liu, J.; **Low, T.; Wang, J.-P.** *Observation and enhancement of room temperature bilinear magnetoelectric resistance in sputtered topological semimetal Pt<sub>3</sub>Sn*. npj Spintronics, **2024**, 2, 32. DOI: [10.1038/s44306-024-00036-1](https://doi.org/10.1038/s44306-024-00036-1) **DMR-2011401**
32. Nelson, G.; Andaraarachchi, H.P.; Held, J.; Eslamisaray, M.A.; **Ilic, O.**; Kortshagen, U. *Nonthermal plasma synthesis of composition-tunable silicon nitride nanoparticle films for passive radiative cooling*. ACS Appl. Optical Mater., **2024**, 2, 935-944. DOI: [10.1021/acsaom.3c00257](https://doi.org/10.1021/acsaom.3c00257) **DMR-2011401**
33. Chen, J.; Willis, S.A.; **Flannigan, D.J.** *Delineation of the impact on temporal behaviors of off-axis photoemission in an ultrafast electron microscope*. Rev. Sci. Instrum., **2024**, 95, 093705. DOI: [10.1063/5.0222993](https://doi.org/10.1063/5.0222993) **DMR-2011401**
34. Choi, M.; Sung, S.H.; Hovden, R.; **Tadmor, E.B.** *Elastic plate basis for the deformation and electron diffraction of twisted bilayer graphene on a substrate*. Phys. Rev. B, **2024**, 110, 024116. DOI: [10.1103/PhysRevB.110.024116](https://doi.org/10.1103/PhysRevB.110.024116) **DMR-2011401**
35. Willis, S.A.; Curtis, W.A.; **Flannigan, D.J.** *Wehnelt photoemission in an ultrafast electron microscope: Stability and usability*. J. Appl. Phys., **2024**, 136, 024901. DOI: [10.1063/5.0214246](https://doi.org/10.1063/5.0214246) **DMR-2011401**
36. †Luo, Y.; Christensen, T.; **Ilic, O.** *Adaptive multi-spectral mimicking with 2D-material nanoresonator networks*. J. Optics, **2024**, 26, 075001. DOI: [10.1088/2040-8986/ad4722](https://doi.org/10.1088/2040-8986/ad4722) **DMR-2011401**
37. Lyu, D.; Khanal, P.; Jia, Q.; Guo, S.; Lv, Y.; Zink, B.R.; Zhang, Y.; Yun, H.; Zhou, B.; **Mkhoyan, K.A.**; Wang, W.G.; **Wang, J.-P.** *Electrical control of the switching layer in perpendicular magnetic tunnel junctions with atomically thin Ir dusting*. Appl. Phys. Lett., **2024**, 124, 182401. DOI: [10.1063/5.0203048](https://doi.org/10.1063/5.0203048) **DMR-2011401**
38. Park, S.H.; Sammon, M.; Mele, E.J.; **Low, T.** *Helical boundary modes from synthetic spin in a plasmonic lattice*. Phys. Rev. B, **2024**, 109, L161301. DOI: [10.1103/PhysRevB.109.L161301](https://doi.org/10.1103/PhysRevB.109.L161301) **DMR-2011401**

39. †Wang, C.; Zhong, Y.; Chen, X.; Wang, H.; **Low, T.**; Chen, H.; Zhang, B.; Lin, X. *Near-field coupling of janus dipoles beyond polarization locking*. Laser and Photonics Rev., **2024**, *18*, 2301035. DOI: [10.1002/lpor.202301035](https://doi.org/10.1002/lpor.202301035) **DMR-2011401**

### Publications Resulting from the USE OF SHARED FACILITIES

40. Bose, S.; Sharma, M.; Torija, M.A.; Walter, J.; Nandakumaran, N.; Dewey, J.; Schmitt, J.; Gazquez, J.; Varela, M.; Zhernenkov, M.; Fitzsimmons, M.R.; Ambaye, H.; Lauter, V.; Hovorka, O.; Berger, A.; **Leighton, C.** *Controlling magnetism and transport at perovskite cobaltite interfaces via strain-tuned oxygen vacancy ordering*. Phys. Rev. Mater., **2025**, *9*, L031402. DOI: [10.1103/PhysRevMaterials.9.L031402](https://doi.org/10.1103/PhysRevMaterials.9.L031402) **DMR-2011401**
41. Azizi, E.; Rezaei, B.; Mostufa, S.; Liang, S.; Wang, Y.A.; Chugh, V.K.; Wang, J.-P.; Li, C.Z.; Gómez-Pastora, J.; He, R.; Wu, K. *Effect of tracer size distribution on magnetic particle imaging performance*. Phys. Scr., **2025**, *100*, 025529. DOI: [10.1088/1402-4896/adab46](https://doi.org/10.1088/1402-4896/adab46) **DMR-2011401**
42. Qin, J.; Bastawisy, T.N.; Chen, J.H.; Shuai, D.M.; Gong, M.L.; Johnston, S.; Pan, Z.Y.; Romay, F.; Ou, Q.S.; Xiong, B.Y. *Antiviral and Sustainable Coating on Textiles by Moringa oleifera Protein for Personal Protective Equipment Applications*. ACS ES&T Eng., **2025**, *5*, 1306-1515. DOI: [10.1021/acsestengg.4c00903](https://doi.org/10.1021/acsestengg.4c00903) **DMR-2011401**
43. Cameron, T.; Klause, B.; Loh, K.Q.; Kortshagen, U.R. *Aluminum-silica core-shell nanoparticles via nonthermal plasma synthesis*. Nanomaterials, **2025**, *15*, 237. DOI: [10.3390/nano15030237](https://doi.org/10.3390/nano15030237) **DMR-2011401**
44. Muttakin, N.; Varapragasam, S.J.P.; Mia, R.; Swadhen, M.A.; Odlyzko, M.; Hoefelmeyer, J.D. *Light driven water oxidation on silica supported NiO-TiO<sub>2</sub> heteronanocrystals yields hydrogen peroxide*. Nanoscale Adv., **2025**, *17*, 10931-10941. DOI: [10.1039/d4na00906a](https://doi.org/10.1039/d4na00906a) **DMR-2011401**
45. Sarmah, A.; Zervoudakis, A.J.; Pfau-Cloud, M.R.; Hillmyer, M.A.; **Ellison, C.J.** *Chemical recycling of polycaprolactones via reactive melt processing*. ACS Appl. Polym. Mater., **2025**, *7*, 1763-1770. DOI: [10.1021/acsapm.4c03575](https://doi.org/10.1021/acsapm.4c03575) **DMR-2011401**
46. Li, R.; Schulpen, J.J.P.M.; Dawley, R.A.; Hirshberg, N.; Odlyzko, M.L.; Lee, S.; Hoque, K.S.; **Low, T.**; McLeod, A.S.; Bol, A.A.; Koester, S.J. *Ultralow-resistance contacts to heavily doped p-type Nb<sub>x</sub>W<sub>1-x</sub>S<sub>y</sub> thin films grown by atomic layer deposition*. ACS Appl. Mater. Interfaces, **2025**, *17*, 10931-10941. DOI: [10.1021/acsami.4c16889](https://doi.org/10.1021/acsami.4c16889) **DMR-2011401**
47. Song, S.; Yao, X.; Wang, C.; Sun, C.C.; Siegel, R.A. *Delaying the first nucleation event of amorphous solid dispersions above the polymer overlap concentration (c\*): PVP and PVPVA in posaconazole*. J. Pharm. Sci., **2025**, *114*, 98-104. DOI: [10.1016/j.xphs.2024.04.026](https://doi.org/10.1016/j.xphs.2024.04.026) **DMR-2011401**
48. Song, S.; Xu, J.; Chen, Z.; Sun, C.C.; Munson, E.J.; Siegel, R.A. *Miscibility of amorphous solid dispersions: A rheological and solid-state NMR spectroscopy study*. J. Pharm. Sci., **2025**, *114*, 119-126. DOI: [10.1016/j.xphs.2024.05.017](https://doi.org/10.1016/j.xphs.2024.05.017) **DMR-2011401**
49. Vaidya, K.; Regan, M.S.; Lin, J.; Houle, J.; Gupta, A.; Stopka, S.A.; Agar, N.Y.R.; Hammond, P.T.; Boehnke, N. *Pooled nanoparticle screening using a chemical barcoding approach*. Angew. Chem. Int. Ed., **2025**, *64*, e202420052. DOI: [10.1002/anie.202420052](https://doi.org/10.1002/anie.202420052) **DMR-2011401**
50. Kresge, G.V.; Neal, C.A.P.; **Calabrese, M.A.** *Low-intensity magnetic fields induce anomalous disorder-to-order transition in spherical block copolymer micelle solutions*. Macromolecules, **2025**, *58*, 279-291. DOI: [10.1021/acs.macromol.4c02346](https://doi.org/10.1021/acs.macromol.4c02346) **DMR-2011401**
51. Ryan, A.G.; Hansen, L.N.; Dillman, A.; Pistone, M.; Zimmerman, M.E.; Williams, S.A. *Shear-induced dilation and dike formation during mush deformation*. Earth Planet Sci. Lett., **2025**, *651*, 119164. DOI: [10.1016/j.epsl.2024.119164](https://doi.org/10.1016/j.epsl.2024.119164) **DMR-2011401**

52. Cheng, J.Y.; Li, Z.; Poerschke, D.L.; Baldwin, J.K.; Bresnahan, B.L.; Mara, N.A. *Thermal stability of 3D interface Cu/Nb nanolaminates*. *Scr. Mater.*, **2025**, 254, 116319. DOI: [10.1016/j.scriptamat.2024.116319](https://doi.org/10.1016/j.scriptamat.2024.116319) **DMR-2011401**
53. Kipp, E.R.; Garcia-Barriocanal, J.; Bhan, A. *Selective catalytic combustion of hydrogen under aerobic conditions on Na<sub>2</sub>WO<sub>4</sub>/SiO<sub>2</sub>*. *Angew. Chem. Int. Ed.*, **2024**, 63, e202412932. DOI: [10.1002/anie.202412932](https://doi.org/10.1002/anie.202412932) **DMR-2011401**
54. Kumar, K.S.; Lee, D.; Varshney, S.; Jalan, B.; Armitage, N.P. *Anomalous frequency and temperature dependent scattering in the dilute metallic phase in lightly doped SrTiO<sub>3</sub>*. *Phys. Rev. Lett.*, **2024**, 133, 136003. DOI: [10.1103/PhysRevLett.133.136003](https://doi.org/10.1103/PhysRevLett.133.136003) **DMR-2011401**
55. Kim, J.; Jacobson, C.R.; Halas, N.J.; Tonks, I.A. *Controlling cubic versus octahedral morphology in plasmonic aluminum nanoparticle synthesis with titanocene catalysts: a systematic study*. *ACS Catal.*, **2024**, 14, 18429-18435. DOI: [10.1021/acscatal.4c06286](https://doi.org/10.1021/acscatal.4c06286) **DMR-2011401**
56. Flowers, M.; Mertens, N.; Billups, A.; Ogle, B.M.; Wang, C. *A novel poly( $\epsilon$ -caprolactone)-based photo-crosslinkable liquid copolymer as a versatile drug delivery platform*. *Pharmaceutics*, **2024**, 16, 1380. DOI: [10.3390/pharmaceutics16111380](https://doi.org/10.3390/pharmaceutics16111380) **DMR-2011401**
57. Maines, E.M.; Zografos, A.; Sample, C.S.; Zervoudakis, A.J.; Reineke, T.M.; Ellison, C.J. *Pendant hydroxy polyethylene reactive additives for improved mechanical properties and melt processability of poly(ethylene terephthalate)/polyethylene blends*. *Macromolecules*, **2024**, 57, 11042-11054. DOI: [10.1021/acs.macromol.4c01329](https://doi.org/10.1021/acs.macromol.4c01329) **DMR-2011401**
58. Chen, Y.-C.; Jia, Q.; Yang, Y.; Huang, Y.-H.; Lyu, D.; Peterson, T.J.; Wang, J.-P. *Enhanced voltage-controlled magnetic anisotropy and field-free magnetization switching achieved with high work function and opposite spin hall angles in W/Pt/W SOT Tri-Layers*. *Adv. Funct. Mater.*, **2024**, 34, 2416570. DOI: [10.1002/adfm.202416570](https://doi.org/10.1002/adfm.202416570) **DMR-2011401**
59. Xu, C.; Andrarachchi, H.P.; Kortshagen, U.R. *Synthesis of composition-tunable ag-cu bimetallic nanoparticles through plasma-driven solution electrolysis*. *Nanomaterials*, **2024**, 14, 1758. DOI: [10.3390/nano14211758](https://doi.org/10.3390/nano14211758) **DMR-2011401**
60. Ezugwu, E.P.; Lopez, E.; Ortin, A.; Bhattacharya, M.; Mantell, S.C. *Relationship between microstructure changes and embrittlement during chemo-oxidative degradation of bimodal HDPE with short chain branches*. *Polymer*, **2024**, 313, 127752. DOI: [10.1016/j.polymer.2024.127752](https://doi.org/10.1016/j.polymer.2024.127752) **DMR-2011401**
61. Kolisnyk, R.; Smith, M.L.; Seaton, N.C.A.; Odlyzko, M.L.; Masiuchok, O.; Riga, J.; Amama, P.B.; Stadler, B.J.H. *Sustainable manufacturing of vertical carbon nanotube (CNT) arrays inside insulating nanoporous membranes using nickel magnetic nanowires (MNWs)*. *ACS Appl. Nano Mater.*, **2024**, 7, 24866-24874. DOI: [10.1021/acsanm.4c04782](https://doi.org/10.1021/acsanm.4c04782) **DMR-2011401**
62. Panigrahi, C.; Kamal, S.; Qin, J.; Ziemann, S.; Rahman, E.; House, M.; Dutcher, C.; Xiong, B. *Removal of pristine and UV-weathered microplastics from water: moringa oleifera seed protein as a natural coagulant*. *Environ. Eng. Sci.*, **2024**, 41, 477-489. DOI: [10.1089/ees.2024.0135](https://doi.org/10.1089/ees.2024.0135) **DMR-2011401**
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89. Morales, H.M.; Sanchez, D.A.; Fletes, E.M.; **Odlyzko, M.**; Padilla-Gainza, V.; Alcoutlabi, M.; Parsons, J.G. *Synthesis and characterization of titanium and vanadium nitride-carbon composites*. J. Compos. Sci., **2024**, 8, 485. DOI: [10.3390/jcs8120485](https://doi.org/10.3390/jcs8120485) **DMR-2011401, DMR-2122178\*\***
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93. Rahman, E.; Binahmed, S.; Keyes, P.; Alberg, C.; Godfreay-Igwe, S.; **Haugstad, G.**; Xiong, B. *Nanoscale abrasive wear of polyethylene: a novel approach to probe nanoplastic release at the single asperity level*. Environ. Sci. Technol., **2024**, 58, 13845-13855. DOI: [10.1021/acs.est.3c09649](https://doi.org/10.1021/acs.est.3c09649)  
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DOI: [10.1016/j.elstat.2024.103924](https://doi.org/10.1016/j.elstat.2024.103924) **DMR-2011401**
  95. Schuler, C.J. et al. *Densely populated biofilms and linked iron and sulfur cycles in the fractured-rock continental subsurface*. Geochim. Cosmochim. Acta, **2024**, *375*, 229-246.  
DOI: [10.1016/j.gca.2024.04.019](https://doi.org/10.1016/j.gca.2024.04.019) **DMR-2011401**
- MRFN/other Publications Resulting from the USE OF SHARED FACILITIES**
96. Wouters, C.L.; Abed, M.M.; Nguyen, T.B.; Froehlich, C.E.; Roy, P.; **Reineke, T.M.**; Haynes, C.L. *Label-free detection of virus-like particles with surface-enhanced raman spectroscopy through analyte localization and polymer-enabled capture*. Anal. Chem., **2024**, *96*, 10302-10312.  
DOI: [10.1021/acs.analchem.4c01117](https://doi.org/10.1021/acs.analchem.4c01117) **DMR-2011401/MRFN**
  97. Zhou, Z.Z.; Joshi, V.C.; Guo, Y.W.; Xiang, T.Y.; Wang, Z.J.; Sun, C.C. *How elastically flexible can molecular crystals be? - a new record*. Chem. Sci. **2025**, *16*, 5797-5802.  
DOI: [10.1039/d5sc01260k](https://doi.org/10.1039/d5sc01260k) **DMR-2011401/MRFN**
  98. Kumar, N.S.K.; Lalge, R; Suryanarayanan, R. *Time and Temperature Dependence of Drug Crystallization-The Role of Molecular Mobility*. Mol. Pharm., **2024**, *21*, 5880-5891.  
DOI: [10.1021/acs.molpharmaceut.4c00935](https://doi.org/10.1021/acs.molpharmaceut.4c00935) **DMR-2011401/MRFN**

## MRSEC-SUPPORTED PATENTS, PERIOD 5

- a. Patents granted during the current reporting period.  
None
- b. Patent applications (excluding provisional applications) submitted during the current reporting period.  
Reineke, T. *Polymer-cargo composition and methods*. Application no. 18/916,949. Application date: 10/16/2024. **DMR-2011401**
- c. Patents and patent applications licensed in the current reporting period.  
None

## MRSEC FACULTY-LEVEL INVITED PRESENTATIONS AT CONFERENCES, PERIOD 5

### **Bartel, Chris:**

1. *Understanding materials synthesis using the thermodynamics of interfacial reactions*. IRG-1, TMS 2025 Annual Meeting, March 23, 2025, Las Vegas, NV

### **Biol, Turan:**

2. *Decomposition of response tensors using point group representations*. IRG-1, Lennard-Jones Centre Discussion Group Series, June 2024, University of Cambridge, Cambridge, United Kingdom
3. *Group representations and tensorial response in crystals*. IRG-1, Bilkent University, Physics Seminar, January 2025, Ankara, Turkey

### **Calabrese, Michelle:**

4. *A novel approach for altering the rheology and self-assembly of block copolymer (BCP) solutions using magnetic fields*. IRG-2, Plenary lecture at SoftComp 20<sup>th</sup> Anniversary Meeting, May 21-24, 2024, Lyon, France.

### **Ferry, Vivian:**

5. *New materials for metasurfaces: electrochemically tunable materials and large-area fabrication*. IRG-1, 10th International Conference on Antennas and Electromagnetic Systems, June 2024, Rome, Italy
6. *New materials for metasurfaces: electrochemically tunable materials and large-area fabrication*. IRG-1, META, July 2024, Toyama, Japan
7. *New materials for metasurfaces: electrochemical materials and switchable chiral nanostructures*. American Vacuum Society, November 2024, Tampa, FL

### **Frisbie, Dan:**

8. *Sub-band filling and ion-carrier interactions in organic electrolyte-gated transistors*. IRG-1, Iontronics Conference, December 2024, Nagano, Japan
9. *Electrochemical Transistors: A platform for exploring carrier transport and ion-carrier correlations at high charge densities in organic semiconductors*. IRG-1, MRS Spring Meeting, April 2024, Seattle, WA

### **Frontiera, Renee:**

10. *Raman spectroscopic probes of solar energy conversion*. Seed, ACS National Meeting, August 2024, Denver, CO
11. *Distinguishing spectator from driving modes in photoinduced chemical reactions*. Seed, ACS National Meeting, March 2024, Minneapolis, MN
12. *Raman spectroscopic probes of energy transfer mechanisms*. Seed, APS GERA Meeting, March 2024, Minneapolis, MN
13. *Mapping excitonic polariton potential energy surfaces via resonance Raman spectroscopy*. . Seed, APS National Meeting, March 2024, Minneapolis, MN
14. *Probing plasmonic photocatalysis with time-resolved Raman spectroscopy*. Seed, Dynamic Catalysis Workshop, November 2024, Leiden, Netherlands
15. *Raman spectroscopic probes of energy transfer mechanisms in solar photochemistry*. Seed, International Conference on Raman Spectroscopy, July 2024, Rome, Italy,
16. *Raman spectroscopic probes of plasmon-molecule and polariton interactions*. Seed, NOW Chains Conference, December 2024, Eindhoven, Netherlands

**Jalan, Bharat**

17. *Complex oxide membranes as dielectrics for 2D material*. IRG-1, 2024 Materials Research Society Fall meeting, December 2024, Boston, MA
18. *Unlocking the Promise and Simplicity of Atomically Precise Synthesis for 4d- and 5d Metal Oxides through Hybrid MBE*. IRG-1, 23rd International Conference on Molecular-Beam Epitaxy, September 2024, Matsue, Japan
19. *Unlocking the hidden potentials in complex oxides using freestanding membranes*. IRG-1, 30th International Workshop on Oxide Electronics (IWOE-30), September 2024, Darmstadt, Germany
20. *Unlocking the Promise and Simplicity of Atomically Precise Synthesis for 4d and 5d Metal Oxides through Hybrid MBE*. IRG-1, Biannual meeting on Research network on Materials with novel Electronic Properties (MaNEP), August 2024, Les Diablerets, Switzerland
21. *Oxide Bicrystals: A Novel Platform for Engineering Quantum Interface*. IRG-1, 2025 Materials Research Society Spring meeting, April 2025, Seattle, WA
22. *From oxide epitaxy to freestanding membranes: opportunities and challenges*. IRG-1, 2025 TMS Annual Meeting & Exhibition, March 2025, Las Vegas, NV
23. *Metallicity at the Unit Cell in Rutile (Ru,Ir)O<sub>2</sub> Oxides*, IRG-1, APS Global Physics Summit 2025, March 2025, Anaheim, CA
24. *High-Mobility, Deep-Ultraviolet Transparent Conducting SrSnO<sub>3</sub> Films with Room-Temperature Mobility Exceeding 140 cm<sup>2</sup>/Vs*. IRG-1, Electronic Materials and Applications (EMA), February 2025, Denver, CO
25. *Unlocking Atomically Precise Oxide Membrane Growth with Molecular Beam Epitaxy*. IRG-1, February 2025, Denver, CO
26. *Opportunities and Challenges of Complex Oxide Membranes*. IRG-1, 50th Conference on the Physics and Chemistry of Surfaces and Interfaces, (PCSI), January 2025, Kona, HI

**Lamb, Jessica**

27. *Multi-mechanism block copolymers using a universal mediator approach*. Seed, PoWER Conference, July 11-12, 2024, Evanston, IL
28. *A universal mediator approach to sequential cationic-anionic polymerization*. Seed, National ACS Meeting, August 18, 2024, Denver, CO
29. *Sequential cationic-anionic polymerization using a universal mediator approach*. Seed, 3M Non-Tenured Faculty Award Symposium, October 4, 2024, Maple Grove, MN
30. *Advancing polymer synthesis using the tools from organic chemistry*. Seed, KU-NDSU Symposium, October 14, 2024, Fargo, ND
31. *Access to diverse block copolymers by sequential cationic-anionic polymerizations*. Seed, National ACS Meeting, March 24, 2025, San Diego, CA

**Leighton, Chris**

32. *Development of metallic non-local spin valves for spin accumulation sensors*. IRG-1, SPIE Spintronics Symposium, August 2024, San Diego, CA

**Lozano, Karen**

33. *Leading with Purpose – How materials Science can shape futures and communities*. IRG-2, Women in Materials Science & Engineering Keynote Breakfast Talk, MRS Fall Conference, December 2024, Boston, MA

**Mahanthappa, Mahesh**

34. *Architectural control of configuration entropy in A/B block copolymer self-assembly: the case of core-shell bottlebrushes*. IRG-2 (partial REU), Brightlands Polymer Days, May 27-28, 2024, Geleen, Netherlands

35. *Synthesis and self-assembly of nonlinear block copolymers toward functional nanotemplates.* IRG-2 (partial REU), Macromolecular Chemistry and Soft Matter Connects, June 13-14, 2024, Aachen, Germany
36. *Architectural control of configuration entropy in A/B block copolymer self-assembly: the case of core-shell bottlebrushes.* IRG-2 (partial REU), AIChE Annual Meeting, October 27-31, 2024, San Diego, CA

**Reineke, Theresa**

37. *Bottlebrush polymers improve binding, solubility, and delivery of small and macromolecular therapeutics.* IRG-2, Invited Keynote Lecture at the American Chemical Society National Meeting, August 21, 2024, Denver, CO
38. *ACS Editor's Tips for Managing Your Data.* IRG-2, American Chemical Society (ACS) on Campus, October 24, 2024, University of Minnesota, Minneapolis, MN

**Wang, Xiaojia**

39. *Understanding and Tailoring Thermal Transport in Perovskite Oxides.* IRG-1, 2025 MRS Meeting, Invited Talk, April 7-11, 2025, Seattle, WA
40. *Active Control of Thermal Transport,* IRG-1, 2024 ASME Summer Heat Transfer Conference, July 15-17, 2024, Anaheim, CA
41. *Time-Resolved Magneto-Optical Kerr Effect (TR-MOKE) for Thermal Characterization and Magnetic Dynamics.* IRG-1, The 36<sup>th</sup> International Thermal Conference (ITCC) & International Thermal Expansion Symposium (ITES), October 27-30, 2024, Charlottesville, VA