

Curriculum Vitæ

Signature



Date 07/04/2017

Personal Information

Efrain E. Rodriguez, PhD.

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Academic Appointments at UMD

Assistant Professor, Department of Chemistry and Biochemistry	August 2012 - present
Affiliate Professor, Department of Materials Science and Engineering	2013 - present
Affiliate Professor, Department of Physics	2015 - present

Past Employment

National Research Council Post-Doctoral Fellow, NIST Center for Neutron Research, National Institute of Standards and Technology, 2009-2012

Graduate Research Assistant, Los Alamos National Laboratories, Los Alamos, NM & Materials Research Laboratory, University of California, Santa Barbara, CA, 2004-2009

Post-baccalaureate Researcher Manuel Lujan Neutron Scattering Center, Los Alamos National Laboratories, Los Alamos, NM, 2003-2004

Educational Background

PhD. Materials Science, 2009, Department of Materials, University of California, Santa Barbara, CA

B.S. Materials Science, 2003, Department of Materials Science and Engineering, Massachusetts Institute of Technology, Cambridge, MA

Professional Memberships

American Chemical Society	American Physical Society
Neutron Scattering Society of America	American Crystallographic Association
Society for the Advancement of Chicanos and Native Americans in Science	

Other Campus Affiliations

Center for Nanophysics and Advanced Materials	UMD NanoCenter
UMD Energy Research Center	Chemical Physics Program
Latino Employees Association	

Research, Scholarly, and Creative Activities

1. Chapters

Author of article titled "Iron-based Superconductors and Related Materials" to appear in *Encyclopedia of Inorganic and Bioinorganic Chemistry*, John Wiley and Son, Inc., Editor-in-Chief Robert A. Scott

2. Articles in Refereed Journals

h-index: 19; * indicates corresponding author, undergraduate authors

Publications while at the University of Maryland

53. Zhou, X.; Eckberg, C.; Wilfong, B.; Liou, S.-C.; Vivanco, H. K.; Paglione, J.; **Rodriguez, E. E.***, "Superconductivity and magnetism in iron sulfides intercalated by metal hydroxides", *Chemical Sciences*, **2017**, *8*, 3781. [DOI:10.1039/C6SC05268A]
52. Larson, A.; Wilfong, B.; Moetakef, P.; Brown, C. M.; Zavalij, P.; **Rodriguez, E. E.***, "Metal-insulator transition tuned by magnetic field in Bi_{1.7}V₈O₁₆ hollandite", *Journal of Materials Chemistry C*, **2017**, *5*, 4967. [DOI: 10.1039/C7TC00487G]
51. Zhou, X.; **Rodriguez, E. E.***, "Tetrahedral transition metal chalcogenides as functional inorganic materials", *Chemistry of Materials*, **2017**, available online. [DOI: 10.1021/acs.chemmater.7b01561] **Paper part of the Up-and-Coming series.**
50. Zhou, X.; Wilfong, B.; Vivanco, H. K.; Paglione, J.; Brown, C. M.; **Rodriguez, E. E.***, "Layered metastable cobalt chalcogenides from topochemical deintercalation", *Journal of the American Chemical Society*, **2016**, *138*, 16432. [DOI: 10.1021/jacs.6b10229]
49. Zhou, X.; Zhou, W.; Udovic, T. J.; Yildirim, T.; Rush, J. J.; **Rodriguez, E. E.**; Wu, H.*, "Development of potential organic-molecule-based hydrogen storage materials: Converting C-N bond-breaking thermolysis of guanidine to N-H bond-breaking dehydrogenation", *International Journal of Hydrogen Energy*, **2016**, *41*, 18542. [DOI: 10.1016/j.ijhydene.2016.08.129]
48. Liu, L.; Taylor, D. D.; **Rodriguez, E. E.**; Zachariah, M. R.*,"Influence of transition metal electronegativity on the oxygen storage capacity of perovskite oxides", *Chemical Communications*, **2016**, *52*, 10369. [DOI: 10.1039/C6CC01997H]
47. Wu, H.*; Zhou, X.; **Rodriguez, E. E.**; Zhou, W.; Udovic, T. J.; Yildirim, T.; Rush, J. J., "A new family of metal borohydride guanidinate complexes: Synthesis, structures and hydrogen-storage properties", *Journal of Solid State Chemistry*, **2016**, *242*, 186. [DOI: 10.1016/j.jssc.2016.07.013]
46. Taylor, Daniel D.; Schreiber, N.; Levitas, B.; Xu, W.; Whitfield, P.; **Rodriguez, E. E.***, "Oxygen storage properties of La_{1-x}Sr_xFeO_{3-δ} for chemical-looping reactions-an in-situ neutron and synchrotron X-ray study", *Chemistry of Materials*, **2016**, *28*, 3951. [DOI: 10.1021/acs.chemmater.6b01274]
45. Vivanco, H. K. and **Rodriguez, E. E.***, "The intercalation chemistry of layered iron chalcogenide superconductors", *Journal of Solid State Chemistry*, **2016**, *242*, 3. [DOI: 10.1016/j.jssc.2016.04.008]

44. Borg, C. K. H.; Zhou, X.; Eckberg, C.; Campbell, D. J.; Saha, S. R.; Paglione, J.; **Rodriguez, E. E.*** “Strong anisotropy in nearly ideal tetrahedral superconducting FeS single crystals”, *Physical Review B*, **2016**, 93, 094522. [DOI: [10.1103/PhysRevB.93.094522](https://doi.org/10.1103/PhysRevB.93.094522)]
Selected for the Editor’s Suggestion
43. Zhou, X.; Borg, C. K. H.; Lynn, J. W.; Saha, S. R.; Paglione, J.; **Rodriguez, E. E.*** “The preparation and phase diagrams of $(\text{}^7\text{Li}_{1-x}\text{Fe}_x\text{OD})\text{FeSe}$ and $(\text{Li}_{1-x}\text{Fe}_x\text{OH})\text{FeSe}$ superconductors”, *Journal of Materials Chemistry C*, **2016**, 4, 3934. [DOI: [10.1039/C5TC04041H](https://doi.org/10.1039/C5TC04041H)]
Hot Paper for special issue on Emerging Investigators.
42. Moetakef, P.; Wang, L.; Nunn, A.; Gaskell, K.; Larson, A. M.; Hodges, B. C.; **Rodriguez, E. E.*** “Tuning the electronic band structure of microporous titanates with the hollandite structure”, *Journal of Materials Chemistry A*, **2015**, 3, 20330. [DOI: [10.1039/C5TA05288B](https://doi.org/10.1039/C5TA05288B)]
41. **Rodriguez, E. E.***; Cao, H.; Haiges, R.; Melot, B. C.* “Single crystal magnetic structure and susceptibility of CoSe_2O_5 ”, *Journal of Solid State Chemistry*, **2015**, 236, 39. [DOI: [10.1016/j.jssc.2015.09.006](https://doi.org/10.1016/j.jssc.2015.09.006)]
40. Lynn, J. W.*; Zhou, X.; Borg, C. K. H.; Saha, S. R.; Paglione, J.; **Rodriguez, E. E.** “Neutron investigation of the magnetic scattering in an iron-based ferromagnetic superconductor”, *Physical Review B*, **2015**, 92, 060510. [DOI: [10.1103/PhysRevB.92.060510](https://doi.org/10.1103/PhysRevB.92.060510)]
39. Stock, C*.; **Rodriguez-Rivera, J. A.**; Schmalzl, K.; **Rodriguez, E. E.**; Stunault, A.; Petrovic, C. “Single to multiquasiparticle excitations in the itinerant helical magnet CeRhIn_5 ”, *Physical Review Letters*, **2015**, 114, 247005. [DOI: [10.1103/PhysRevLett.114.247005](https://doi.org/10.1103/PhysRevLett.114.247005)]
38. Taylor, D. D.; Schreiber, N. J.; Brown, C. M.; Arevalo-Lopez, A.; **Rodriguez, E. E.*** “Stabilization of cubic $\text{Sr}_2\text{FeMoO}_6$ through topochemical reduction”, *Chemical Communications*, **2015**, 51, 12201. [DOI: [10.1039/C5CC04145G](https://doi.org/10.1039/C5CC04145G)]
37. Lennox, R. C.; Taylor, D. D.; Vera Stimpson, L. J.; Stenning, G. B. G.; Jura, M.; Price, M. C.; **Rodriguez, E. E.**; Arnold, D. C.* “PZT-like structural phase transitions in the BiFeO_3 - KNbO_3 solid solution”, *Dalton Transactions*, **2015**, 44, 10608. [DOI: [10.1039/c5dt00140d](https://doi.org/10.1039/c5dt00140d)]
36. Larson, A. M.; Moetakef, P.; Gaskell, K. J.; Brown, C.; King, G.; **Rodriguez, E. E.***; “Inducing ferrimagnetism in insulating hollandite $\text{Ba}_{1.2}\text{Mn}_8\text{O}_{16}$ ”, *Chemistry of Materials*, **2015**, 27, 515. [DOI: [10.1021/cm503801j](https://doi.org/10.1021/cm503801j)]
35. Phelan, D.; **Rodriguez, E. E.**; Bing, Y.; Gao, J.; Ye, Z.; Huang, Q.; Wen, J.; Xu, G.; Stock, C.; Matsuura, M.; Gehring, P. M.* “Phase diagram of the relaxor ferroelectric $(1-x)\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3 + x\text{PbTiO}_3$: A neutron powder diffraction study of the relaxor skin effect.”, *Phase Transitions* **2015**, 88, 283. [DOI: [10.1080/01411594.2014.989226](https://doi.org/10.1080/01411594.2014.989226)]
34. Decaroli, C; Arevalo-Lopez, A. M.; Woodall, C. H.; **Rodriguez, E. E.**; Attfield, J. P.; Parker, S. F.; Stock, C.* “ $(\text{C}_4\text{H}_{12}\text{N}_2)[\text{CoCl}_4]$: tetrahedrally coordinated Co^{2+} without the orbital degeneracy” *Acta Crystallographica B*, **2015**, 71, 20. [DOI: [10.1107/S2052520614024809](https://doi.org/10.1107/S2052520614024809)]
33. Moetakef, P.; Larson, A. M.; Hodges, B. C.; Zavalij, P. Gaskell, K. J.; Piccoli, P.; **Rodriguez, E. E.***, “Synthesis and crystal chemistry of microporous titanates $\text{K}_x(\text{Ti},\text{M})_8\text{O}_{16}$ where $\text{M} = \text{Sc-Ni}$.”, *Journal of Solid State Chemistry*, **2014**, 220, 45. [DOI: [10.1016/j.jssc.2014.08.012](https://doi.org/10.1016/j.jssc.2014.08.012)]

32. Stacey, T. E.; Borg, C. K. H.; Zavalij, P.; **Rodriguez, E. E.***, “Magnetically Stabilized $\text{Fe}_8(\mu_4\text{-S})_6\text{S}_8$ Clusters in $\text{Ba}_6\text{Fe}_{25}\text{S}_{27}$ ”, *Dalton Transactions*, **2014**, 43, 14612. [DOI: [10.1039/C4DT01182A](https://doi.org/10.1039/C4DT01182A)]
31. McCabe, E. E.; Stock, C.; **Rodriguez, E. E.**; Wills, A. S.; Taylor, J. W.; Evans, J. S. O.*, “Weak spin interactions in Mott insulating $\text{La}_2\text{O}_2\text{Fe}_2\text{OSe}_2$ ”, *Physical Review B*, **2014**, 89, 100402(R). [DOI: [10.1103/PhysRevB.89.100402](https://doi.org/10.1103/PhysRevB.89.100402)]
30. Rondinelli, J. M.; Benedek, N. A.; Freedman, D. E.; Kavner, A.; **Rodriguez, E. E.**; Toberer, E. S.; Martin, L. W., “Accelerating functional materials discovery”, *American Ceramic Society Bulletin*, **2013**, 92, 14-2.
29. Gaultois, M. W.*; Barton, P. T.; Birkel, C. S.; Misch, L. M.; Stucky, G. D.; **Rodriguez, E. E.**; Seshadri, R., “Structural disorder, magnetism, electrical and thermoelectric properties of pyrochlore $\text{Nd}_2\text{Ru}_2\text{O}_7$ ”, *Journal of Physics: Condensed Matter*, **2013**, 25, 186004. [DOI: [10.1088/0953-8984/25/18/186004](https://doi.org/10.1088/0953-8984/25/18/186004)]

Publications while at the National Institute of Standards and Technology

28. Stock, C.; **Rodriguez, E. E.**; Lee, N. Green, M. A.; Demmel, R. A.; Ewings, R. A.; Fouquet, P.; Laver, M.; Niedermayer, Y. S.; Nemkovski, K.; Rodriguez-Rivera, J. A.; Cheong, S.-W., “Solitary magnons in the $S = 5/2$ antiferromagnet CaFe_2O_4 ”, *Physical Review Letters*, **2016**, 117, 017201. [DOI: [10.1103/PhysRevLett.117.017201](https://doi.org/10.1103/PhysRevLett.117.017201)]
27. Stock, C.; **Rodriguez, E. E.**; Sobolev, O.; Rodriguez-Rivera, J. A.; Ewings, R. A.; Taylor, J. W.; Christianson, A. D.; Green, M. A., “Soft striped magnetic fluctuations competing with superconductivity in Fe_{1+x}Te ”, *Physical Review B*, **2014**, 90, 121113(R). [DOI: [10.1103/PhysRevB.90.121113](https://doi.org/10.1103/PhysRevB.90.121113)]
26. **Rodriguez, E. E.**; Stock, C.; Sokolov, D. A.; Green, M. A.; Sobolev, O.; Rodriguez-Rivera, J. A.; Cao, H.; Daoud- Aladine, A., “Magnetic and structural properties near the Lifshitz point in Fe_{1+x}Te ”, *Physical Review B* **2013**, 88, 165110. [DOI: [10.1103/PhysRevB.88.165110](https://doi.org/10.1103/PhysRevB.88.165110)]
25. Blachowski, A.; Ruebenbauer, K.; Zajdel, P.; **Rodriguez, E. E.**; Green, M. A., “Mossbauer study of the ‘11’ iron-based superconductors parent compound Fe_{1+x}Te ”, *Journal of Physics: Condensed Matter*, **2012**, 24, 386006. [DOI: [10.1088/0953-8984/24/38/386006](https://doi.org/10.1088/0953-8984/24/38/386006)]
24. Stock, C.; **Rodriguez, E. E.**; Green, M. A., “Spin fluctuations and superconductivity in powders of $\text{Fe}_{1+x}\text{Te}_{0.7}\text{Se}_{0.3}$ ”, *Physical Review B*, **2012**, 85, 094507. [DOI: [10.1103/PhysRevB.85.094507](https://doi.org/10.1103/PhysRevB.85.094507)]
23. Bhatia, V.; **Rodriguez, E. E.**; Butch N. P.; Paglione, J.; Green, M. A., “Phase separation and superconductivity in $\text{Fe}_{1+x}\text{Te}_{0.5}\text{Se}_{0.5}$ ”, *Chemical Communications*, **2011**, 47, 11297. [DOI: [10.1039/C1CC13878B](https://doi.org/10.1039/C1CC13878B)]
22. **Rodriguez, E. E.**; Stock, C.; Hsieh, P.-Y.; Butch, N. P.; Paglione, J.; Green, M. A., “Interstitial iron-controlled superconductivity in $\text{Fe}_{1+x}\text{Te}_{0.7}\text{Se}_{0.3}$ ”, *Chemical Science*, **2011**, 2, 1782. [DOI: [10.1039/C1SC00114K](https://doi.org/10.1039/C1SC00114K)]
21. Stock, C.; **Rodriguez, E. E.**; Green, M. A.; Rodriguez-Rivera, J. A., “Gapped spin fluctuations and interstitial iron in the Fe_{1+x}Te parent compound”, *Physical Review B*, **2011**, 84, 045124. [DOI: [10.1103/Phys-RevB.84.045124](https://doi.org/10.1103/Phys-RevB.84.045124)]

20. **Rodriguez, E. E.**; Stock, C.; Zajdel, P.; Krycka, K. L.; Majkrzak, C. F.; Zavalij, P.; Green, M. A., "Magnetic-crystallographic phase diagram of the superconducting parent compound Fe_{1+x}Te ", *Physical Review B*, **2011**, *84*, 064403. [DOI: [10.1103/PhysRevB.84.064403](https://doi.org/10.1103/PhysRevB.84.064403)]
19. **Rodriguez, E. E.**; Stock, C.; Krycka, K. L.; Majkrzak, C. F.; Kirshenbaum, K.; Butch, N. P.; Saha, S. R.; Paglione, J.; Green, M. A., "Non-collinear spin-density wave antiferromagnetism in FeAs ", *Physical Review B*, **2011**, *83*, 134438. [DOI: [10.1103/PhysRevB.83.134438](https://doi.org/10.1103/PhysRevB.83.134438)]
18. Zajdel, P.; Hsieh, P.-Y.; **Rodriguez, E. E.**; Butch, N. P.; Magill, J. D.; Paglione, J.; Zavalij, P.; Suchomel, M. R.; Green, M. A., "Phase separation and suppression of the structural and magnetic transitions in superconducting doped iron tellurides $\text{Fe}_{1+x}\text{Te}_{1-y}\text{S}_y$ ", *Journal of the American Chemical Society*, **2010**, *132*, 13000. [DOI: [10.1021/ja105279p](https://doi.org/10.1021/ja105279p)]
17. **Rodriguez, E. E.**; Zavalij, P.; Hsieh, P.-Y.; Green, M. A., "Iodine as an oxidant in the topotactic deintercalation of Fe_{1+x}Te ", *Journal of the American Chemical Society*, **2010**, *132*, 10006. [DOI: [10.1021/ja104004t](https://doi.org/10.1021/ja104004t)]

Publications from graduate work at the University of California Santa Barbara

16. Johnstone, E. V.; Poineau, F.; Starkey, J.; Hartmann, T.; Forster, P.M.; Ma, L.; Hilgar, J.; **Rodriguez, E. E.**; Farmand, R.; Czerwinski, K. R.; Sattelberger, A. P., "Synthetic and coordination chemistry of the heavier trivalent technetium binary halides: Uncovering technetium triiodide", *Inorganic Chemistry*, **2013**, *52*, 14309. [DOI: [10.1021/ic402278c](https://doi.org/10.1021/ic402278c)]
15. **Rodriguez, E. E.**; Poineau, F.; Llobet, A.; Kennedy, B. J.; Avdeev, M.; Thorogood, G. J.; Carter, M. L.; Singh, D. J.; Seshadri, R.; Cheetham, A. K., "High temperature magnetic ordering in the 4d perovskite SrTcO_3 ", *Physical Review Letters*, **2011**, *106*, 067201. [DOI: [10.1103/PhysRevLett.106.067201](https://doi.org/10.1103/PhysRevLett.106.067201)]
14. **Rodriguez, E. E.**; Poineau, F.; Llobet, A.; Thompson, J. D.; Seshadri, R.; Cheetham, A. K., "Preparation, magnetism and electronic structures of cadmium technetates", *Journal of Materials Chemistry*, **2011**, *21*, 1496. [DOI: [10.1039/c0jm02470h](https://doi.org/10.1039/c0jm02470h)]
13. Melot, B. C.; Darago, L. E.; Seshadri, R.; Goldman, A.; Furman, J. D.; **Rodriguez, E. E.**; "Magnetic ordering and magnetodielectric phenomena in CoSeO_4 ", *Journal of Physics: Condensed Matter*, **2010**, *22*, 506003. [DOI: [10.1088/0953-8984/22/50/506003](https://doi.org/10.1088/0953-8984/22/50/506003)]
12. Weck, P. F.; Kim, E.; Poineau, F.; **Rodriguez, E. E.**; Sattelberger, A. P.; Czerwinski, K. R. "Structural and electronic trends in rare-earth technetates", *Dalton Transactions*, **2010**, *39*, 7207. [DOI: [10.1039/c0dt00212g](https://doi.org/10.1039/c0dt00212g)]
11. **Rodriguez, E. E.**; Llobet, A.; Proffen, Th.; Melot, B. C.; Seshadri, R.; Littlewood, P. B.; Cheetham, A. K., "The role of static disorder in negative thermal expansion in ReO_3 ", *Journal of Applied Physics*, **2009**, *109*, 114901. [DOI: [10.1063/1.3120783](https://doi.org/10.1063/1.3120783)]
10. Poineau, F.; **Rodriguez, E. E.**; Forster, P. M.; Sattelberger, A. P.; Cheetham, A. K.; Czerwinski, K. R., "Preparation of the binary technetium bromides: TcBr_3 and TcBr_4 ", *Journal of the American Chemical Society*, **2009**, *131*, 6281. [DOI: [10.1021/ja808597r](https://doi.org/10.1021/ja808597r)]

9. Wilcox, J. D.; **Rodriguez, E. E.**; Doeff, M. M., "The impact of aluminum and iron substitution on the structure and electrochemistry of $\text{Li}(\text{Ni}_{0.4}\text{Co}_{0.2-y}\text{M}_y\text{Mn}_{0.4})\text{O}_2$ materials", *Journal of the Electrochemical Society*, **2009**, 156, A1011. [DOI: [10.1149/1.3237100](https://doi.org/10.1149/1.3237100)]
8. Shoemaker, D.; **Rodriguez, E. E.**; Abumohor, I. S.; Proffen, Th.; Seshadri, R.; "Intrinsic exchange bias in $\text{Zn}_x\text{Mn}_{3-x}\text{O}_4$ solid solutions", *Physical Review B* **2009**, 80, 144422. [DOI: [10.1103/PhysRevB.80.144422](https://doi.org/10.1103/PhysRevB.80.144422)]
7. Weck, P. F.; Kim, E.; Poineau, F.; **Rodriguez, E. E.**; Sattelberger, A. P.; Czerwinski, K. R., "Technetium (IV) halides predicted by first-principles", *Inorganic Chemistry*, **2009**, 48, 6555. [DOI: [10.1021/ic900476m](https://doi.org/10.1021/ic900476m)]
6. **Rodriguez, E. E.**; Poineau, F.; Llobet, A.; Czerwinski, K. R.; Seshadri, R.; and Cheetham, A. K, "Preparation and crystal structures of bismuth technetates: a new metal oxide system", *Inorganic Chemistry*, **2008**, 47, 6281. [DOI: [10.1021/ic8003273](https://doi.org/10.1021/ic8003273)]
5. **Rodriguez, E. E.**; Poineau, F.; Llobet, A.; Sattelberger, A. P.; Bhattacharjee, J.; Waghmare, U. V.; Hartmann, T.; Cheetham, A. K, "Structural studies of TcO_2 by neutron powder diffraction and first-principles calculations", *Journal of the American Chemical Society*, **2007**, 129, 10244. [DOI: [10.1021/ja0727363](https://doi.org/10.1021/ja0727363)]
4. Melot, B.; **Rodriguez, E.**; Proffen, Th.; Hayward, M. A.; Seshadri, R., "Displacive disorder in three high- k bismuth oxide pyrochlores", *Materials Research Bulletin*, **2006**, 41, 961. [DOI: [10.1016/j.materresbull.2006.02.004](https://doi.org/10.1016/j.materresbull.2006.02.004)]
3. **Rodriguez, E. E.**; Proffen, Th.; Llobet, A.; Mitchell, J. F.; Rhyne, J. J., "Neutron diffraction study of the average and local structure of $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ ", *Physical Review B* **2005**, 71, 104430. [DOI: [10.1103/Phys-RevB.71.104430](https://doi.org/10.1103/Phys-RevB.71.104430)]

Publications from undergraduate work at MIT

2. Ross, C.A.; Castano, T.; **Rodriguez, E.**; Haratani, S.; Vogeli, B.; Smith, H. I., "Size-dependent switching of multilayer magnetic elements", *Journal of Applied Physics*, **2005**, 97, 053902. [DOI: [10.1063/1.1850998](https://doi.org/10.1063/1.1850998)]
1. Marioni, M.; Bono, D.; Banful, A.B.; del Rosario, M.; **Rodriguez, E.**; Peterson, B.; Allen, S.M.; O'Handley, R.C., "Pulsed field actuation of Ni-Mn-Ga ferromagnetic shape memory alloy single crystal", *Journal de Physique IV (Paris)* **2003**, 112, 1001. [DOI: [10.1051/jp4:20031050](https://doi.org/10.1051/jp4:20031050)]

4. Invited Talks

Invited Talks while at the University of Maryland

"Beam Line Science for Materials Discovery and Design"

Physics Next Workshop: Materials Design and Discovery

2017, Long Island, NY

"Tetrahedral Transition Metal Chalcogenides as Functional Inorganic Materials"

Georgia Institute of Technology, Dept. of Chemistry and Biochemistry

2017, Atlanta, GA

Florida State University, Dept. of Chemistry

2017, Tallahassee, FL

Northwestern University, MRSEC

2017, Chicago, IL

Wayne State University, Dept. of Chemistry

2017, Detroit, MI

University of Michigan, Dept. of Materials Science & Engineering	2017, Ann Arbor, MI
University of Houston, Dept. of Chemistry	2017, Houston, TX
University of Texas Dallas, Dept. of Chemistry	2017, Dallas, TX
Texas A&M University, Dept. of Chemistry	2017, College Station, TX
Colorado State University, Dept. of Chemistry	2017, Ft. Collins, CO
University of Central Florida, Dept. of Chemistry	2017, Orlando, FL
University of California Davis, Dept. of Chemistry	2016, Davis, CA
University of Southern California, Dept. of Chemistry	2016, Los Angeles, CA
University of Connecticut, Dept. of Chemistry	2016, Wilmington, DE
Duquesne University, Dept. of Chemistry	2016, Pittsburgh, PA

"Magnetism, Superconductivity, and Hund's Rule in Metallic Oxides and Chalcogenides"
 Symposium in Honor of Prof. Anthony K. Cheetham 2016, Cambridge, U.K.

"Superconductors of Tomorrow. Where do we go from iron-based materials?"
 Gordon Research Conference on Solid State Chemistry 2016, New London, NH

"Superconductivity and Magnetism in Layered Metal Chalcogenides"
 Center for Computational Materials Sciences 2016 Fall Meeting 2016, Stony Brook, NY
 Center for Nanophysics and Advanced Materials (UMD) 2016, College Park, MD
 Oak Ridge National Laboratory, Neutron Sciences Division 2016, Oak Ridge, TN

"Complex Magnetism and Metal-Insulator Transition in Microporous Metal Oxides"
 International Materials Research Congress 2016, Cancun, Mexico

"Transition Metal Oxides for Chemical Looping Reactions"
 Chemical and Biomolecular Engineering (UMD) 2016, College Park, MD

"Magnetic Structure and Dynamics in Iron-based Superconductors"
 NIST Center for Neutron Research Summer School 2015, Gaithersburg, MD

"Exploring New Magnetic Phenomena in Hund's Metals"
 North American Conference on Solid State Chemistry 2015, Tallahassee, FL

"Hollandite Oxides as a Route to Magnetic Insulators"
 Chemical Society of Canada National Conference 2015, Ottawa, Canada

"Magnetic and bonding trends in djefisherite-type $Ba_6M_{25}S_{27}$ and mackinawite FeS "
 American Chemical Society National Meeting 2014, San Francisco, CA

"Mixed-Valence Microporous Oxides for Magnetic Properties"
 American Conference on Neutron Scattering 2014, Knoxville, TN

"Magnetic ordering and metal-insulator transitions in hollandite-type oxides"
 American Crystallography Association National Meeting 2015, Philadelphia, PA

"Local Structural Effects on the Magnetism of Doped $Ba_xMn_8O_{16}$ Hollandites"
"The Crystal Chemistry of Technetium Oxides and Halides"
 American Crystallography Association National Meeting 2014, Albuquerque, NM

"Magnetism and Superconductivity in Tetrahedral Iron Chalcogenides"
 University of Delaware, Dept. of Chemistry 2015, Wilmington, DE

“Chemical, Structural, and Magnetic Trends in Iron-based Superconductors”
 Drexel University, Dept. of Materials Science and Eng. 2013, Philadelphia, PA

“Exploring the Structural, Magnetic, and Chemical Degrees of Freedom in Transition Metal Compounds”
 Kyoto University, Dept. of Energy and Hydrocarbon Chemistry 2013, Kyoto, Japan

“Chemical, Structural, and Magnetic Trends in Iron Chalcogenides”
 University of Edinburgh, School of Physics and Astronomy 2013, Edinburgh, UK
 University of Glasgow, School of Chemistry 2013, Glasgow, UK
 University of Kent, School of Physical Sciences 2013, Kent, UK

Invited Talks while at the National Institute of Standards and Technology

“Interstitial Iron Effects on Magnetic Excitations in Fe_{1+x}Te”
 American Physical Society March Meetings 2012, Boston, MA

“Lecture on Neutron Diffraction”
 School on Representational Analysis and Magnetic Structures 2011, Washington D. C.

“Local structure effects in magnetoresistance materials”
 American Crystallography Association National Meeting 2010, Chicago, IL

5. Symposia and Conferences Organized

American Conference on Neutron Scattering
 Co-chair of scientific program (est. 450 attendees) 2018, College Park, MD

American Crystallography Association National Meeting
 Symposium on *Materials Discovery and Crystal Growth* 2015, Philadelphia, PA

250th American Chemical Society National Meeting
 Symposium on *Emergent Phenomena in the Solid State* 2017, San Francisco, CA
 Symposium on *Magnetochemistry in Molecules and Extended Solids* 2015, Boston, MA

Neutron Day
 Full day symposium on collaborations between UMD and NIST 2015, College Park, MD

XXII International Materials Research Congress
 Symposium on *Materials Characterization with Neutrons* 2013, Cancun, Mexico

6. Schools Organized

Fundamentals of Quantum Materials, co-organizer
 6-day workshop and school on *Synthesis of Quantum Materials* 2017, College Park, MD

School on Representational Analysis and Magnetic Structures, co-organizer
 4-day school on solving magnetic structures with neutron data 2015, College Park, MD

7. Workshops

National Science Foundation, discussion leader and co-author of final report
Workshop: Advancing and Accelerating Materials Innovation 2017, Ballston, VA

Department of Energy, Office of Sciences, participant and co-author of report
Basic Research Needs Report on Synthesis Science for Energy Related Tech. 2016, Rockville, MD

National Science Foundation, participant and co-author on final report. *Workshop: The Materials Genome Initiative in Ceramics, Geosciences, and Solid-State Chemistry* 2017, Ballston, VA

8. Sponsored Research and Programs

External single-PI grants

Department of Energy, Basic Energy Sciences, DESC-0016434
“The Next Ferroic Order: Synthesis and Neutron Scattering of Ferrotoroidic Materials”
\$538,854, principal investigator
08/01/2016 – 7/31/2019

National Science Foundation, Division of Materials Research, DMR-1455118
“CAREER: Designing Hund’s Metals from Transition Metal Sulfides”
\$625,000, principal investigator
4/01/2015 – 3/31/2020;

External multi-PI grants

Department of Commerce, 70NANB15H261
“UMD / NCNR Joint Program for the Adv. of Neutron Scattering”
\$2,599,585; Rodriguez’s portion \$85,000 per year
PI Robert Briber (MSE) and co-PI’s: Ichiro Takeuchi (MSE) and Johnpierre Paglione (Physics)
09/01/2015-08/31/2020

Air Force Office of Science Research, FA-95501410332
“Exploration and Development of Advanced Superconducting Materials”
\$1,200,000, Rodriguez’s portion \$50,000 per year
PI: Johnpierre Paglione (Physics) and co-PI’s Richard L. Greene (Physics), Ichiro Takeuchi (MSE)
08/01/2014-09/14/2019

Defense University Research Instrumentation Program
“Instrumentation for the Materials Genome Approach to the Search for Superconductivity”
\$600,000 for the purchase of a Magnetic Measurement Property System
PI: Johnpierre Paglione (Physics) and co-PI’s Richard L. Greene (Physics), Ichiro Takeuchi (MSE)

9. Research Fellowships, Prizes and Awards

Research and Scholarship Award from the University of Maryland Graduate School, 2013
National Research Council Post-doctoral Fellowship Award
Selected for the 58th Annual Meeting of Nobel Laureates in Lindau, Germany
NSF Integrative Graduate Education and Research Traineeship, IGERT

Teaching, Mentoring, and Advising

Courses Taught

Semester	Course	Enrollment
Fall 2012	CHEM601: Structure and Bonding in Molecules and Materials	10
Fall 2013	CHEM601: Structure and Bonding in Molecules and Materials	17
Spring 2014	CHEM401: Inorganic Chemistry	74
Fall 2014	CHEM601: Structure and Bonding in Molecules and Materials	18
Spring 2015	CHEM401: Inorganic Chemistry	49
Fall 2015	CHEM146: General Principles of Chemistry for Majors	42
Fall 2015	CHEM899D: Inorganic/Organic Seminar	15
Spring 2016	CHEM602: Advanced Inorganic Chemistry	7
Fall 2016	CHEM146: General Principles of Chemistry for Majors	50

CHEM399: Introduction to Chemical Research (undergraduate), 7 students

CHEM899: Doctoral Dissertation Research, 7 students

Research Advising

Undergraduate interns (dates in lab)

Binyamin Katz (Fall 2012-Spring 2014)

Nathaniel Schreiber, ASPIRE student and NSF Graduate Fellow at Cornell University (Fall 2012-Spring 2015)

Brenna Hodges, Beckman Scholar and NSF Graduate Fellow at Yale University (Spring 2014-Fall 2015)

Natalia Schoch-Lopez, Biochemist at Lancaster Laboratories (Spring 2015-Fall 2016)

Hector Vivanco, Louis Stokes Alliance for Minority Participation Fellow and graduate student at Johns Hopkins University (Spring 2015-Spring 2017)

Ben Levitas, Graduate student at Boston University (Spring 2015 – Spring 2017)

Navneeth Babra, Citrine Informatics Undergraduate Fellow (Summer 2017)

Hadas Elazar-Mittelman (Summer 2017)

Master's

Christopher K. H. Borg, Citrine Informatics (Fall 2013-Fall 2015)

Doctoral

Daniel D. Taylor, PhD in 2017, Dissertation "Structural and Chemical Factors Governing Anion Reactivity in Perovskite Oxides." Currently Data Scientist at Precision Systems Inc. in Washington D.C.

Amber M. Larson, PhD in 2017, Dissertation "Frustrated Magnetism and Electronic Properties of Hollandite Oxide Materials."

Current Graduate Students

Xiuquan Zhou

Austin Virtue

Rishvi Jayathilake

Brandon Wilfong

Stephanie Gnewuch

Post-doctoral

Dr. Timothy E. Stacey, PhD from University of Wisconsin Madison, July 2013 to May 2014
Currently Data Scientist at RAND Corporation, Washington D.C.

Dr. Pouya Moetakef, PhD from University of California Santa Barbara, July 2013 to May 2015
Currently Detector Engineer at NASA Goddard Space Center, Greenbelt, MD

High School Students (dates in lab)

Mitchell Moore, Eleanor Roosevelt High School, Currently undergraduate at Texas A&M University
(Summer 2015 – Spring 2016)

Ariane Chandler, McKinley Technology High School, ACS Project SEED (Summer 2014)

Other Advising Activities

Faculty advisor of the *American Chemical Society UMD Student Affiliates*, undergraduate club for hosting seminars and performing outreach from Fall 2012 to present

Faculty advisor to the Dept. of Chemistry and Biochemistry's *Graduate Student Organization* from Fall 2016 to present

Service and Outreach

Reviewing Activities for Journals

Journal of American Chemical Society
Inorganic Chemistry
Journal of Materials Chemistry A and C
Chemical Communications
Physical Review B
Journal of Physics: Condensed Matter

Chemistry of Materials
Journal of Solid State Chemistry
Nature Communications
Physical Review Letters
Physical Review Materials

Reviewing Activities for Agencies and Foundations

On-site reviewer for funding of research programs at Argonne National Laboratories, May 2017.

Reviewer and panel member for National Science Foundation grant proposals in Solid State and Materials Chemistry, March 2015 & 2016

Departmental Committees

Curriculum Committee	2017-present
NSF GAANN Review Committee	2017
Merit Pay and Awards Committee	2016-2017
<i>Ad hoc</i> committee for the re-building of Chemistry Wing 1	2016-2017
Facilities and Resources Committee	2015-2016
Faculty Advisory Committee	2014-2016
Graduate Admissions Committee	2012-2015
PhD committee member for 10 graduate students	2012-present

PhD Thesis Committees

Lu Liu	Andrew J. Keane	Cathryn Gail Blakely
Jeffrey B. Delisio	Aaron Geller	Kaitlyn E. Crawford
Samantha DeCarlo	Ashley Lidie Ruth (MSE)	Tyler Drye (Physics)

External Committees

Advisory committee for construction of new neutron beam line DISCOVER at Oak Ridge National Laboratory

Beam Time Allocation Committee, NIST Center for Neutron Research

Site Review Committee, Oak Ridge National Laboratory

Corporate Board Memberships

Citrine Informatics Scientific Advisory Board

Outreach Presentations

Johns Hopkins Center for Talented Youth, Five 45-minute presentations for their Science and Technology Series consisting of demonstrations and lectures. Spring 2017 & 2015.

Panelist and participant for bilingual event titled *Sábado de Ciencias* at nearby Nicholas Orem Middle School, Spring 2015

Panelist for bilingual workshop *Paving the Way: Event for Latino High School Parents and Students* on campus for students at nearby Northwestern High School, Fall 2014.

Organizer and panelist Workshop *STEM Expo for Parents* sponsored by the Office for Minorities in Science and Engineering, 2014.

Media Contributions

Recorded a series of segments on high school chemistry topics in our laboratory by a filming crew of MacNeil-Lehrer Productions for *Discovery Education's Techbook*, an e-textbook.