

## *Curriculum Vitae*

### **Efrain E. Rodriguez, PhD.**

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#### Academic Appointments at UMD

|  |                        |
|--|------------------------|
| Associate Professor, Department of Chemistry and Biochemistry        | May 2018 – present     |
| Assistant Professor, Department of Chemistry and Biochemistry        | August 2012 – May 2018 |
| Affiliate Professor, Department of Materials Science and Engineering | 2013 – 2018            |
| Affiliate Professor, Department of Physics                           | 2015 – present         |
| Core Faculty Member, Maryland Quantum Materials Center               | 2019 – present         |
| Faculty Member, Chemical Physics Program                             | 2013 – present         |
| Faculty Member, UMD NanoCenter                                       | 2014 – present         |

#### Administrative Appointments at UMD

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| Graduate Program Director for Chemistry, | August 2018 – July 2021 |
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#### Other Employment

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| National Research Council Post-Doctoral Fellow<br>NIST Center for Neutron Research, National Institute of Standards and Technology<br>Gaithersburg, MD | 2009-2012 |
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| Graduate Research Assistant<br>Los Alamos National Laboratories (LANL)<br>Los Alamos, NM | 2005-2008 |
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| Post-baccalaureate Researcher<br>Manuel Lujan Neutron Scattering Center, LANL<br>Los Alamos, NM | 2003-2004 |
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#### Educational Background

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| PhD. Materials Science,<br>Department of Materials<br>University of California, Santa Barbara, CA | 2009 |
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| B.S. Materials Science,<br>Department of Materials Science and Engineering<br>Massachusetts Institute of Technology, Cambridge, MA | 2003 |
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#### Professional Certifications, Licenses, and Memberships

- American Institute of Physics, Board of Directors
- Neutron Scattering Society of America, executive committee member
- American Crystallographic Association, member
- U.S. National Committee for Crystallography (USNC/Cr), member

- Society for the Advancement of Chicanos/Hispanics and Native Americans in Science, member and faculty adviser

## **I. Research, Scholarly, Creative and/or Professional Activities**

### **I.A. Books**

- I.A.1. Books Edited  
*Fundamentals of Quantum Materials: A Practical Guide to Synthesis and Exploration*  
 J. Paglione, N. Butch, and **E. E. Rodriguez**  
 World Scientific, New Jersey, 2020  
 ISBN: 978-981-121-937-5

### **I.B. Chapters**

- I.B.1. Books  
 "Chapter 6: Hydrothermal Synthesis and Crystal Growth"  
 Wilfong, B., Zhou, X. and **Rodriguez, E. E.**  
*Fundamentals of Quantum Materials: A Practical Guide to Synthesis and Exploration*  
 World Scientific, New Jersey, **2021**  
 ISBN: 978-981-121-937-5

- I.B.2. Encyclopedia  
**Rodriguez, E. E.\*** "Iron-based Superconductors"  
*Encyclopedia of Inorganic and Bioinorganic Chemistry, 2019.*

### **I.C. Refereed Journals**

#### **I.C.1. Refereed Journal Articles**

h-index = 28, i10-index = 55, citations: 2433 (from Google Scholar)

\* indicates corresponding author and driver of published work

91. Gnewuch, S.; **Rodriguez, E. E.\***, Description of Magnetic Toroidal Lattices in the Solid State", *in preparation*.

90. Tosado, J.; Gnewuch, S.; Diethrich, T.; Qureshi, N.; Stock, C.; **Rodriguez, E. E.\***, "Ferrotoroidic order through spherical neutron polarimetry", *in preparation*.

89. Leonard, M.; Li, T.; Kramer, M.; McDonnell, S. M.; Vedernikov, A. N.; **Rodriguez, E. E.\***, "Synthesis of Ordered Mesoporous Cerium Doped Titanium Oxide for Toxic Chemical Filtration", *submitted*.

88. Diethrich, T. J.; Gnewuch, S.; Dold, K.; Taddei, K.; **Rodriguez, E. E.\***, "Tuning Magnetic Symmetry and Properties in the Olivine Series  $\text{Li}_{1-x}\text{Fe}_x\text{Mn}_{1-x}\text{PO}_4$  through Selective Delithiation", *Chemistry of Materials, under review*.

87. Algrim, L.; Gibbons, W.; Li, T.; Leonard, M.; **Rodriguez, E. E.**; Eichhorn, B.; Zachariah, M. R., "Adsorption Kinetics within Mesoporous SBA16 of DMMP and Methanol to Probe Mass Transfer Limits", *Chemical Engineering Science, under review*.

86. Campbell, D. J.; Wilfong, B.; Zic, M. P.; Levy, G.; Na, M. X.; Pedersen, T. M.; Gorovikov, S.; Zavalij, P. Y.; Zhdanovich, S.; Damascelli, A.; **Rodriguez, E. E.**; Paglione, J., "Physical properties and electronic structure of single-crystal  $\text{KCo}_2\text{As}_2$ ." *Physical Review Materials*, **2022**, 6, 045003 [DOI: [10.1103/PhysRevMaterials.6.045003](https://doi.org/10.1103/PhysRevMaterials.6.045003)]
85. Li, T.; Tsyshevsky, R.; McEntee, M.; Durke, E. M.; Karwacki, C.; **Rodriguez, E. E.**, Kuklja, M. M., "Detection of Sarin Reactivity on Titania Nanomaterials: Understanding Fundamentals" *ACS Applied Nano Materials*, **2022**, available online [DOI: [doi.org/10.1021/acsanm.2c00693](https://doi.org/10.1021/acsanm.2c00693)]
84. A. McDannald, M. Frontzek, A. T. Savici, M. Doucet, **E. E. Rodriguez**, K. Meuse, J. Opsahl-Ong, D. Samarov, I. Takeuchi, A. G. Kusne, and W. Ratcliff, "On-the-fly autonomous control of neutron diffraction via physics-informed bayesian active learning," *Applied Physics Reviews*, **2022**, 9, 021408 [DOI:[10.1063/5.0082956](https://doi.org/10.1063/5.0082956)].
83. Li, T.; Jayathilake, R.; Balisetty, L.; Zhang, Y.; Wilfong, B.; Diethrich, T.; **Rodriguez, E. E.\***, Crystal field-induced lattice expansion upon reversible oxygen uptake/release in  $\text{YbMn}_x\text{Fe}_{2-x}\text{O}_4$ ", *Materials Advances*, **2022**, 3(2), 1087-110. [DOI:[10.1039/D1MA00822F](https://doi.org/10.1039/D1MA00822F)]
82. Li, T.; **Rodriguez, E. E.\***, "Mesoporous perovskite titanates via hydrothermal conversion", *Chemical Communications*, **2022**, 58, 783-786. [DOI: [10.1039/D1CC05343D](https://doi.org/10.1039/D1CC05343D)]
81. Lane, H. **Rodriguez, E. E.**; Walker, H.C.; Niedermayer, Ch.; Stuhr, U.; Bewley, R.I.; Voneshen, D.J.; Green, M.A.; Rodriguez-Rivera, J.A.; Fouquet, P.; Cheong, S.-W.; Atfield, J. P.; Ewings, R. A.; Stock, C., "Metastable antiphase boundary ordering in  $\text{CaFe}_2\text{O}_4$ ", *Physical Review B*, **2021**, 104(1), 104404 . [DOI: [10.1103/PhysRevB.104.104404](https://doi.org/10.1103/PhysRevB.104.104404)]
80. Li, T.; Tsyshevsky, R.; Algrim, L.; McEntee, M.; Durke, E. M.; Eichhorn, B.; Zachariah, M. R.; Kuklja, M. M.; **Rodriguez, E. E.\***, "Understanding Dimethyl Methylphosphonate Adsorption and Decomposition on Mesoporous  $\text{CeO}_2$ ", *ACS Applied Materials & Interfaces* **2021**, 13(45), 54597-54609 [DOI: [10.1021/acscami.1c16668](https://doi.org/10.1021/acscami.1c16668)].
79. Zheng, H.; Wilfong, B.; Hickox-Young, D.; Rondinelli, J.; Zavalij, P. Y.; **Rodriguez, E. E.\*** "A Polar Ferromagnetic Metal by Intercalation of Metal-amine Complexes," *Chemistry of Materials*, **2021**, 33, 4936-4947. [DOI: [10.1021/acs.chemmater.1c00540](https://doi.org/10.1021/acs.chemmater.1c00540)]
78. Diethrich, T. J.; Gnewuch, S.; Zavalij, P.Y.; **Rodriguez, E. E.\*** "Orbital contribution to paramagnetism and non-innocent thiophosphate anions in layered  $\text{Li}_2\text{MP}_2\text{S}_6$  where  $M = \text{Fe, Co}$ ," *Inorganic Chemistry*, **2021**, 60, 10280-10290. [DOI: [10.1021/acs.inorgchem.1c00710](https://doi.org/10.1021/acs.inorgchem.1c00710)]
77. Gillard, C.; Zhou, X.; Avdeev, M.; **Rodriguez, E. E.**; Sharma, Neeraj "On the electrochemical phase evolution of cobalt selenide in alkali ion batteries," *Inorganic Chemistry*, **2021**, 60, 7150-7160. [DOI: [10.1021/acs.inorgchem.1c00226](https://doi.org/10.1021/acs.inorgchem.1c00226)]
76. Campbell, D. J.; Collini, J.; Slawinska, J.; Autieri, C.; Wang, L.; Wang, K.; Wilfong, B.; Eo, Y.S.; Neves, P.; Graf, D.; **Rodriguez, E. E.**; Butch, N. P.; Buongiorno Nardelli, M.; Paglione, J., "Topologically-Driven Linear Magnetoresistance in Helimagnetic  $\text{FeP}$ ," *npj Quantum Materials*, **2021**, 6, 38. [DOI: [10.1038/s41535-021-00337-2](https://doi.org/10.1038/s41535-021-00337-2)]

75. Trainer C.; Songvilay, M.; Qureshi, N.; Stunault, A.; Yim, C. M.; **Rodriguez, E. E.**; Heil, C.; Tsurkan, V.; Green, M. A.; Loidl, A.; Wahl, P. and Stock, C., "Magnetic surface reconstruction in the van der Waals antiferromagnet  $\text{Fe}_{1+x}\text{Te}$ ," *Physical Review B*, **2021**, 103, 024406. [[DOI: 10.1103/PhysRevB.103.024406](https://doi.org/10.1103/PhysRevB.103.024406)]
74. Guiton, B. S.; Stefik, M.; Augustyn, V.; Banerjee, S.; Bardeen, C. J.; Bartlett, B. M.; Li, J.; López-Mejías, V.; MacGillivray, L. R.; Morris, A.; **Rodriguez, E. E.**; Samia, A.C. S.; Sun, H.; Sutter P.; Talham D. R., "Frontiers in hybrid and interfacial materials chemistry research," *Materials Research Bulletin*, **2020**, 45, 951-964. [[DOI: 10.1557/mrs.2020.271](https://doi.org/10.1557/mrs.2020.271)]
73. Gnewuch, S.; **Rodriguez, E. E.**, "Distinguishing the intrinsic antiferromagnetism in polycrystalline  $\text{LiCoPO}_4$  and  $\text{LiMnPO}_4$  Olivines." *Inorganic Chemistry*, **2020**, 59, 5883-5895. [[DOI: 10.1021/acs.inorgchem.9b03545](https://doi.org/10.1021/acs.inorgchem.9b03545)]
72. Cooley, J. A.; Bocarsly, J. D.; Schueller, E. C.; Levin, E. E.; **Rodriguez, E. E.**; Huq, A.; Lapidus, S. H.; Wilson, S. D.; Seshadri, R. "Evolution of noncollinear magnetism in magnetocaloric  $\text{MnPtGa}$ ", *Physical Review Materials*, **2020**, 4, 044405. [[DOI: 10.1103/PhysRevMaterials.4.044405](https://doi.org/10.1103/PhysRevMaterials.4.044405)]
71. Zhou, X.; Wang, L.; Fan, X.; Wilfong, B.; Liou, S.-C.; Wang, Y.; Zheng, H.; Feng, Z.; Wang, C.; **Rodriguez, E. E.**, "Isotope Effect between  $\text{H}_2\text{O}$  and  $\text{D}_2\text{O}$  in Hydrothermal Synthesis", *Chemistry of Materials*, **2020**, 32, 765. [[DOI: 10.1021/acs.chemmater.9b04121](https://doi.org/10.1021/acs.chemmater.9b04121)]
70. Wilfong, B.; Zhou, X.; Zheng, H.; Babra, N.; Brown, C.; Lynn, J. W.; Taddei, K.; Paglione, J.; **Rodriguez, E. E.**, "Long-range magnetic order in hydroxide-layer-doped  $(\text{Li}_{1-x-y}\text{Fe}_x\text{Mn}_y\text{OD})\text{FeSe}$ ", *Physical Review Materials*, **2020**, 4, 034803. [[DOI: 10.1103/PhysRevMaterials.4.034803](https://doi.org/10.1103/PhysRevMaterials.4.034803)]
69. DePablo, J. J.; Jackson, N. E.; Webb, M.; Chen, L.-Q.; Moore, J.; **Rodriguez, E. E.** et al. "New frontiers for the materials genome initiative", *NPJ Computational Materials*, **2019**, 5, 41. [[DOI: 10.1038/s41524-019-0173-4](https://doi.org/10.1038/s41524-019-0173-4)]
68. Tosado, J.; Chen, W.C.; Gnewuch, S.; Hasaan, T.; Dax, T.; **Rodriguez, E. E.**, "Small-angle neutron polarimetry apparatus (SANPA): Development at the NIST Center for Neutron Research ", *Review of Scientific Instruments*, **2019**, 90, 063303. [[DOI: 10.1063/1.5091110](https://doi.org/10.1063/1.5091110)]
67. Tosado, J.; Chen, W.C.; **Rodriguez, E. E.**, "A strategy for handling aberration in Spherical Neutron Polarimetry ", *Journal of Physics: Conference Series*, **2019**, 1316, 012015. [[DOI: 10.1088/1742-6596/1316/1/012015](https://doi.org/10.1088/1742-6596/1316/1/012015)]
66. Virtue, A.; Zhou, X.; Wilfong, B.; Lynn, J. W.; Taddei, K.; Zavalij, P.; Wang, L.; **Rodriguez, E. E.**, "Magnetic order effects on the electronic structure of  $\text{KMMnS}_2$  ( $\text{M}=\text{Cu},\text{Li}$ ) with the  $\text{ThCr}_2\text{Si}_2$ -type structure", *Physical Review Materials*, **2019**, 3, 044411. [[DOI: 10.1103/PhysRevMaterials.3.044411](https://doi.org/10.1103/PhysRevMaterials.3.044411)]
65. Li, T.; Jayathilake, R.; Taylor, D. D.; **Rodriguez, E. E.**, "Structural studies of the perovskite series  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_{3-d}$  during chemical looping with methane", *Chemical Communications*, **2019**, 55, 4929. [[DOI: 10.1039/C8CC09573F](https://doi.org/10.1039/C8CC09573F)]

64. Trainer, C.; Yim, C. M.; Heil, C.; Giustino, F; Croitori, D.; Tsurkan, V.; Loidl, A.; **Rodriguez, E. E.**; Stock, C.; Wahl, P., "Manipulating surface magnetic order in iron telluride", *Science Advances*, **2019**, 5, eaav3478. [DOI: [10.1126/sciadv.aav3478](https://doi.org/10.1126/sciadv.aav3478)]
63. Gnewuch, S.; **Rodriguez, E. E.\*** "The fourth ferroic order: Current status on ferrotoroidic materials", *Journal of Solid State Chemistry*, **2019**, 271, 175. [DOI: [10.1016/j.jssc.2018.12.035](https://doi.org/10.1016/j.jssc.2018.12.035)]
62. Wang, X.; Jayathilake, R.; Taylor, D. D.; **Rodriguez, E. E.**, Zachariah, M. R "Study of C/Doped  $\delta$ -Bi<sub>2</sub>O<sub>3</sub> Redox Reactions by in Operando Synchrotron X-ray Diffraction: Bond Energy/Oxygen Vacancy and Reaction Kinetics Relationships" *Journal of Physical Chemistry C*, **2018**, 122(16), 8796. [DOI: [10.1021/acs.jpcc.8b01402](https://doi.org/10.1021/acs.jpcc.8b01402)]
61. Sarte, P. M.; Cowley, R. A.; **Rodriguez, E. E.**; Stock, C.; et al., "Disentangling orbital and spin exchange interactions for Co<sup>2+</sup> on a rocksalt lattice", *Physical Review B*, **2018**, 98, 024415. [DOI: [10.1103/PhysRevB.98.024415](https://doi.org/10.1103/PhysRevB.98.024415)]
60. Songvilay, M.; **Rodriguez, E. E.**; Lindsay, R.; Green, M. A.; Walker, H. C.; Rodriguez-Rivera, J. A.; Stock, C., Anharmonic Magnon Excitations in Noncollinear and Charge-Ordered RbFe<sup>2+</sup>Fe<sup>3+</sup>F<sub>6</sub>, *Physical Review Letters*, **2018** [DOI: [10.1103/PhysRevLett.121.087201](https://doi.org/10.1103/PhysRevLett.121.087201)]
59. Zhou, X.; Wilfong, B.; Liou, S.-C., Hodovanets, H.; Brown C. M. and **Rodriguez, E.E\***, "Proton and ammonia intercalation into layered iron chalcogenides", *Chemical Communications*, **2018**, Special Issue on Emerging Investigators 2018. [DOI: [10.1039/C8CC02436G](https://doi.org/10.1039/C8CC02436G)]
58. Jayathilake, R.; Levitas, B.; **Rodriguez, E. E.\***, "In situ diffraction studies on reversible oxygen uptake and release in AFe<sub>2</sub>O<sub>4+ $\delta$</sub>  (A = Lu, Yb, Y, In)", *Journal of Materials Chemistry A*, **2018**, 6, 4801-4810. [DOI: [10.1039/C7TA09823E](https://doi.org/10.1039/C7TA09823E)]
57. Wilfong, B.; Zhou, X.; Vivanco, H. K.; Campbell, D. J.; Wang, K.; Graf, D.; Paglione, J.; **Rodriguez, E. E.\***, "Frustrated magnetism in tetragonal CoSe, analogue to superconducting FeSe", *Physical Review B*, **2018**, 97, 104408. [DOI: [10.1103/PhysRevB.97.104408](https://doi.org/10.1103/PhysRevB.97.104408)]
56. Vera Stimpson, L. J.; **Rodriguez, E. E.**; Brown, C. M.; Stenning, G. B. B; Jura, M.; Arnold, D. C. "Magnetic ordering in a frustrated bow-tie lattice", *Journal of Materials Chemistry C*, **2018**, 6, 4541, [DOI: [10.1039/C7TC05187E](https://doi.org/10.1039/C7TC05187E)]
55. Stanev, V; Oses, C.; Kusne, A. G.; **Rodriguez, E. E.**; Paglione, J.; Curtarolo, S.; Takeuchi, I., "Machine learning modeling of superconducting critical temperature", *npj Computational Materials*, **2018**, 4, 29, [DOI: [10.1038/s41524-018-0085-8](https://doi.org/10.1038/s41524-018-0085-8)]
54. Stock, C.; **Rodriguez, E. E.**; Lee, N.; Demmel, F.; Fouquet, P.; Laver, M.; Niedermayer, Ch.; Su, Y.; Nemkovski, K; Green, M.A.; Rodriguez-Rivera, J. A.; Kim, J.W.; Zhang, L.; Cheong, S.-W., "Orphan spins in the S = 5/2 antiferromagnet CaFe<sub>2</sub>O<sub>4</sub>", *Physical Review Letters*, **2017**, 119, 257204. [DOI: [10.1103/PhysRevLett.119.257204](https://doi.org/10.1103/PhysRevLett.119.257204)]

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  $\text{Bi}_{1.7}\text{V}_8\text{O}_{16}$  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**, *29*, 5737. [[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  $\text{La}_{1-x}\text{Sr}_x\text{FeO}_{3-\delta}$  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](#)] **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  $({}^7\text{Li}_{1-x}\text{Fe}_x\text{OD})\text{FeSe}$  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](#)] **Hot Paper for special issue on Emerging Investigators.**

42. **Rodriguez, E. E.\***; Cao, H.; Haiges, R.; Melot, B. C.\* “Single crystal magnetic structure and susceptibility of  $\text{CoSe}_2\text{O}_5$ ”, *Journal of Solid State Chemistry*, **2016**, 236, 39. [DOI: [10.1016/j.jssc.2015.09.006](https://doi.org/10.1016/j.jssc.2015.09.006)]
41. 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)]
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  $\text{CeRhIn}_5$ ”, *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  $\text{BiFeO}_3$  -  $\text{KNbO}_3$  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)]
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### **Published articles before appointment at the University of Maryland**

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  $\text{CaFe}_2\text{O}_4$ ", *Physical Review Letters*, **2016**, *117*, 017201. [[DOI: 10.1103/PhysRevLett.117.017201](https://doi.org/10.1103/PhysRevLett.117.017201)]

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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)]

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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)]
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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  $\text{ReO}_3$ ", *Journal of Applied Physics*, **2009**, *109*, 114901. [DOI: [10.1063/1.3120783](https://doi.org/10.1063/1.3120783)]

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9. Wilcox, J. D.; **Rodriguez, E. E.**; Doeff, M. M., "The impact of aluminum and iron substitution on the structure and electrochemistry of Li(Ni<sub>0.4</sub>Co<sub>0.2-y</sub>M<sub>y</sub>Mn<sub>0.4</sub>)O<sub>2</sub> 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 Zn<sub>x</sub>Mn<sub>3-x</sub>O<sub>4</sub> solid solutions", *Physical Review B* **2009**, *80*, 144422. [[DOI: 10.1103/PhysRevB.80.144422](https://doi.org/10.1103/PhysRevB.80.144422)]
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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<sub>2</sub> 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 La<sub>0.5</sub>Ca<sub>0.5</sub>MnO<sub>3</sub>", *Physical Review B* **2005**, *71*, 104430. [[DOI: 10.1103/Phys-RevB.71.104430](https://doi.org/10.1103/Phys-RevB.71.104430)]
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)]

I.D.            Conferences, Workshops, and Talks

I.D.1.        Keynotes

*Richard D. Green Science and Mathematics Award and Lecture  
California State University at Long Beach*

*2020, Long Beach, CA*

- Plenary talk *“Hard Matter Science of Synthesis: Where are We Headed?”*  
Neutron Scattering User Group Meeting, ORNL 2019, Oak Ridge, TN
- Etter Award talk *“Hydrogen Bonding and Symmetry Relationships in Quantum Materials”*  
Annual Meeting of the American Crystallographic Association 2019, Covington, KY
- I.D.2. Invited Talks
- “Functional Inorganic Materials at the University of Maryland”*  
Breaking Barriers through Chemistry 2021, virtual meeting  
Inaugural conference to promote chemical research between Mexico, U.S. and Europe.
- “Understanding oxygen storage materials synthesis and properties by combined neutron and x-ray diffraction”*  
Materials Synthesis Science and Opportunities Aided by in-situ Scattering  
Oak Ridge National Laboratory Neutron Scattering Workshop 2020, virtual meeting
- “Designing New Quantum Materials through Intercalation Chemistry”*  
Dept. of Materials Science and Engineering seminar 2020, virtual meeting  
University of Florida, Gainesville
- “Past and future workshops on magnetic structure determination”*  
Annual Meeting of the American Crystallographic Association 2020, virtual meeting
- “Hydrogen Bonding in Quantum Materials”*  
NSF Center for Sustainable Nanotechnology 2020, virtual meeting
- “Hydrogen Bonding in Layered Superconductors and Magnetic Materials”*  
Denver X-ray Meeting 2020, virtual meeting
- “Electronic transport in Fe and Co chalcogenides prepared from intercalation chemistry”*  
American Chemical Society National Meeting 2019, San Diego, CA
- “Getting over the Tenure Activation Barrier”*  
American Chemical Society National Meeting 2019, Orlando, FL
- “Functional Inorganic Materials at the University of Maryland”*  
Seoul National University 2018, Seoul, South Korea
- “The Fourth Ferroic: Ferrotoroidicity and Spherical Neutron Polarimetry”*  
American Crystallography Association National Meeting 2018, Toronto, Canada
- “In situ Powder Diffraction of Metal Oxides under Chemical Looping Conditions”*  
Deutches Elektronen-Synchrotron (DESY) Workshop 2018, Hamburg, Germany  
Pittsburgh Diffraction Society Annual Conference 2017, Indiana, PA
- “Advanced Powder Diffraction of Oxygen Storage Materials”*  
Winter School on “Frontiers in Materials Science”  
Jawaharlal Nehru Centre for Advanced Scientific Research 2017, Bangalore, India

*“Tetrahedral Transition Metal Chalcogenides as Functional Inorganic Materials”*  
 Muhlenberg College, Chemistry Department 2019, Allentown, PA  
 University of Missouri, Dept. of Physics and Astronomy 2019, Columbia, MO  
 Columbia University, Materials Research & Science Center 2018, NYC, NY  
 Technische Universität Darmstadt 2018, Darmstadt, Germany  
 Johns Hopkins University, Dept. of Chemistry 2018, Baltimore, MD  
 University California Berkeley, Dept. of Chemistry 2017, Berkeley, CA  
 Rutgers University, LSM/IAMD inter-departmental seminars 2017, Piscataway, NJ

*“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 Chem. & 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 Stn, 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, CP, 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
- "Interstitial Iron Effects on Magnetic Excitations in  $Fe_{1+x}Te$ "*  
American Physical Society March Meetings 2012, Boston, MA
- "Local structure effects in magnetoresistance materials"*  
American Crystallography Association National Meeting 2010, Chicago, IL
- I.D.3. Symposia
- Symposium on *Crystallography of Quantum Materials*  
American Crystallography Association National Meeting 2019, Covington, KY
- Symposium on *Structure-Property Correlations in Functional Materials*  
American Chemical Society National Meeting 2019, Orlando, FL
- American Conference on Neutron Scattering  
Co-chair of scientific program (est. 400 attendees) 2018, College Park, MD
- Symposium on *Emergent Phenomena in the Solid State*

|        |   |  |
|--------|---|--|
|        | American Chemical Society National Meeting  | 2017, San Francisco, CA  |
|        | Symposium on <i>Magnetochemistry in Molecules and Extended Solids</i><br>American Chemical Society National Meeting                                     | 2015, Boston, MA   |
|        | Symposium on <i>Materials Discovery and Crystal Growth</i><br>American Crystallography Association National Meeting                                     | 2015, Philadelphia, PA   |
|        | <i>"Neutron Day"</i><br>Full day symposium on collaborations between UMCP and NIST  | 2015, College Park, MD   |
|        | Symposium on <i>Materials Characterization with Neutrons</i><br>XXII International Materials Research Congress  | 2013, Cancun, Mexico   |
| I.D.4. | Workshops   |  |
|        | <i>"Interaction of X-rays and Neutrons with Matter"</i><br>National School on X-ray and Neutron Scattering  | 2021 virtual<br>2020 virtual<br>2019 Oak Ridge, TN   |
|        | <i>Fundamentals of Quantum Materials</i> , co-organizer<br>6-day workshop and school on Synthesis of Quantum Materials                                  | 2020, College Park, MD<br>2019, College Park, MD<br>2018, College Park, MD<br>2017, College Park, MD |
|        | <i>School on Representational Analysis and Magnetic Structures</i> , co-organizer<br>4-day school on solving magnetic structures with neutron data      | 2021, College Park, MD<br>2018, College Park, MD<br>2015, College Park, MD                           |
|        | <i>Workshop: Role of the new Second Target State on Materials Discovery</i><br>ORNL, discussion leader and co-author of final report                    | 2019, Oak Ridge, TN  |
|        | <i>Workshop: Solid State and Materials Chemistry Hybrids and Interfaces</i><br>NSF, discussion leader and co-author of final report                     | 2019 Alexandria, VA  |
|        | Workshop: Quantum Materials Young Investigators<br>ORNL, invited speaker and participant  | 2019, Oak Ridge, TN  |
|        | <i>Workshop: Advancing and Accelerating Materials Innovation</i><br>NSF, discussion leader and co-author of final report                                | 2017, Ballston, VA   |
|        | <i>Basic Research Needs Report on Synthesis Science for Energy Related Technologies</i><br>DOE, Office of Sciences, participant and co-author of report | 2016, Rockville, MD  |
|        | <i>Workshop: The Materials Genome Initiative in Ceramics, Geosciences, &amp; Solid-State Chem.</i><br>NSF, participant and co-author on final report.   | 2013, Ballston, VA   |

I.E. Sponsored Research and Programs – Administered by the Office of Research Administration (ORA)

I.E.1. Grants

External single-PI grants (all dollar amounts listed are total costs)

National Science Foundation, Division of Materials Research, DMR-2113682  
“Non-centrosymmetric Quantum Materials through Metal-amine Complexes”  
\$375,000.00  
05/01/2021 to 04/30/2024  
Principal Investigator of grant

Department of Energy, Basic Energy Sciences, DESC-0016434  
“Discovering Toroidal Materials with Spherical Neutron Polarimetry”  
\$653,000.00  
08/01/2019 to 7/31/2022  
Principal Investigator of grant

Department of Energy, Basic Energy Sciences, DESC-0016434  
“The Next Ferroic Order: Synthesis and Neutron Scattering of Ferrotoroidic Materials”  
\$538,854.00  
08/01/2016 to 7/31/2019  
Principal Investigator of grant

National Science Foundation, Division of Materials Research, DMR-1455118  
“CAREER: Designing Hund’s Metals from Transition Metal Sulfides”  
\$625,000.00  
4/01/2015 to 3/31/2020  
Principal Investigator of grant

External multi-PI grants

Department of Defense, Defense Threat Reduction Agency, HDTRA1-19-1-0001  
“Bifunctional Materials for CWA Defeat: Integrating Catalysts in High-Capacity Mesoporous Metal Oxide Absorbents”  
\$1,323,508.00  
10/04/2018 to 10/03/2023  
Rodriguez’s portion \$631,986 total  
PI Efrain E. Rodriguez and co-PIs: Maija Kukla (UMD Engineering, NSF), Monica McEntee and Erin Durke (U. S. Army ECBC), and Michael Zachariah (Univ. California Riverside)

Department of Commerce, 70NANB15H261  
“UMD / NIST Center for the Application of Neutron Scattering”  
\$8,584,141  
09/01/2017 to 08/31/2022  
Rodriguez’s portion approximately \$42,500 per year  
PI Robert Briber (MSE) and co-PIs: Johnpierre Paglione (Physics), Efrain E. Rodriguez (Chem & Biochem), and Ichiro Takeuchi (MSE) and

Department of Commerce, 70NANB15H261  
 "UMD / NCNR Joint Program for the Adv. of Neutron Scattering"  
 \$2,599,585.00  
 09/01/2015 to 08/31/2020  
 Rodriguez's portion approximately \$300,000 total  
 PI Robert Briber (MSE) and co-PIs: Johnpierre Paglione (Physics), Efrain E. Rodriguez (Chem & Biochem), and Ichiro Takeuchi (MSE) and

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

Defense University Research Instrumentation Program  
 "Instrumentation for the Materials Genome Approach to the Search for Superconductivity"  
 \$600,000  
 2016  
 Funds for capital equipment of purchase of a Magnetic Measurement Property System  
 PI Johnpierre Paglione (Physics) and co-PIs: Richard L. Greene (Physics), Efrain E. Rodriguez (Chem & Biochem), and Ichiro Takeuchi (MSE)

I.E.2. Other

"Leading the Structural Sciences through New Single Crystal X-ray Instrumentation"  
 Maryland Instrumentation Fund 2021  
 \$793,093  
 coPIs: Peter Y. Zavalij (Chem and Biochem) and E. E. Rodriguez (Chem & Biochem)

I.F. Research Fellowships, Prizes and Awards

|  |      |
|--|------|
| Alexander von Humboldt Fellowship for Experienced Researchers                  | 2020 |
| Margaret C. Etter Early Career Award in Crystallography                        | 2019 |
| National Science Foundation CAREER Award                                       | 2015 |
| Research and Scholarship Award from the University of Maryland Graduate School | 2013 |
| National Research Council Post-doctoral Fellowship Award                       | 2009 |

**II. Teaching, Extension, Mentoring, and Advising**

II.A. Courses Taught

| <u>Semester</u> | <u>Course</u>                            | <u>Enrollment</u> |
|-----------------|--|-------------------|
| Spring 2015     | CHEM401: Inorganic Chemistry             | 49                |
| Spring 2018     | CHEM401: Inorganic Chemistry             | 54                |
| Spring 2019     | CHEM401: Inorganic Chemistry             | 51                |
| Spring 2016     | CHEM602: Advanced Inorganic Chemistry II | 7                 |
| Spring 2020     | CHEM602: Advanced Inorganic Chemistry II | 7                 |
| Spring 2021     | CHEM602: Advanced Inorganic Chemistry II | 10                |



|             |   |     |
|-------------|---|-----|
| Fall 2015   | CHEM146: General Principles of Chemistry for Majors     | 42  |
| Fall 2016   | CHEM146: General Principles of Chemistry for Majors     | 50  |
| Fall 2017   | CHEM146: General Principles of Chemistry for Majors     | 37  |
| Fall 2019   | CHEM271: General Chemistry and Energetics               | 81  |
| Fall 2020   | *CHEM271: General Chemistry and Energetics              | 313 |
| Fall 2018   | CHEM611: Professional Skills for Graduate Students      | 19  |
| Fall 2019   | CHEM611: Professional Skills for Graduate Students      | 21  |
| Fall 2020   | CHEM611: Professional Skills for Graduate Students      | 24  |
| Winter 2019 | CHEM612: Scientific Presentations for Graduate Students | 19  |
| Winter 2020 | CHEM612: Scientific Presentations for Graduate Students | 20  |
| Winter 2021 | CHEM612: Scientific Presentations for Graduate Students | 22  |
| Fall 2015   | CHEM899D: Inorganic/Organic Seminar                     | 15  |
| Fall 2019   | CHEM889: Seminar  | 10  |

\* This course was co-taught virtually with Prof. Christopher Jarzynski

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

CHEM899: Doctoral Dissertation Research, 10 students

## II.B. Advising: Research or Clinical

### II.B.1. Undergraduate

- Vince Wendekind (Spring 2020-present)
- Kaitlyn Dold (Spring 2020- present)
- Noah Katz (Summer 2019-present)
- Sarah Joyce (Summer 2019 – Spring 2020)
- Hadas Elazar-Mittelman (Summer 2017-Spring 2018), currently graduate student at Northwestern University
- Navneeth Babra, (Summer 2017-Fall 2017)
- Sarah Bender (Spring 2017-Spring 2018), currently graduate student at University of Illinois-Urbana Champaign
- Ben Levitas (Spring 2015 – Spring 2017), currently graduate student at Boston University
- Hector Vivanco, (Spring 2015-Spring 2017), currently graduate student at Johns Hopkins University
- Natalia Schoch-Lopez, (Spring 2015-Fall 2016), currently research associate at AstraZeneca
- Brenna Hodges (Spring 2014-Fall 2015), Beckman Scholar while at UMD and NSF Graduate Fellow at Yale University
- Nathaniel Schreiber (Fall 2012-Spring 2015), ASPIRE student while at UMD and NSF Graduate Fellow at Cornell University
- Binyamin Katz (Fall 2012-Spring 2014)

### II.B.2. Master's advised

Justin Yu, American Chemical Society (Fall 2017-Spring 2019)

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

### II.B.3. Doctoral

Brandon Wilfong, PhD in 2020, Dissertation “Magnetism and Superconductivity in Topotactically Modified Transition metal Chalcogenides.” Currently Post-doctoral researcher at Naval Academy in Annapolis, MD.

Marcus Carter, PhD in 2019, Dissertation “Polymer Assisted Assembly of Inorganic Materials for Next Generation Batteries.” Currently Post-doctoral researcher at the National Institute of Standards and Technology in Gaithersburg, MD.

Rishvi Jayathilake, PhD in 2019, Dissertation “Oxygen Storage Properties of Ternary Metal Oxide Systems for Chemical Looping Reactions.” Currently Research Scientist at Intel Corp. in Portland, OR.

Austin Virtue, PhD in 2019, Dissertation “Structure and Properties of Alloyed Chalcogenides with the  $\text{ThCr}_2\text{Si}_2$ -type Structure.”

Xiuquan Zhou, PhD in 2018, Dissertation “Intercalation Chemistry of Tetrahedral Transition Metal Chalcogenides.” Currently Post-doctoral researcher at Argonne National Laboratory, Argonne, IL.

Daniel D. Taylor, PhD in 2017, Dissertation “Structural and Chemical Factors Governing Anion Reactivity in Perovskite Oxides.” Currently Data Scientist at Ford Motor Company, Detroit, MI.

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

#### Current PhD students

Stephanie Gnewuch (started Fall 2016)

Timothy Diethrich (started Fall 2017)

Huafei Zheng (started Fall 2017)

Tianyu Li (started Fall 2017)

Lahari Balisetty (started Fall 2018)

Matthew Leonard (started Fall 2018)

Mario Lopez (started Fall 2019)

#### PhD defense committee member for following students

Lu Liu (Zachariah group)

Andrew J. Keane (Sita group)

Cathryn Gail Blakely (Sita group)

Jeffrey B. Delisio (Zachariah group)

Aaron Geller (Eichhorn group)

Kaitlyn E. Crawford (Sita group)

Samantha DeCarlo (Eichhorn group)

Ashley Lidie Ruth (Wachsman group, Materials Science and Engineering)

Tyler Drye (Paglione group, Physics)

Maria Teresa Perez-Cardenas (Nie group)

Richard Thompson (Sita group)

Shaoyi Zhang (Nie group)

Kim Lien Thi Huynh (Eichhorn group)  
Yang Wang (S.-B. Lee group)  
Christopher Eckberg (Paglione Physics)  
Marcus Carter (Nie & Rodriguez groups)  
Scott Holdren (Zachariah group)  
Lauren Stevens (Eichhorn group)  
Daniel J. Campbell (Paglione group, Physics)  
I-Lin Liu (Paglione group, Physics)  
Tao Wu (Zachariah group)  
Luning Wang (Eichhorn group)  
Wei Wu (D. Liu group, Chemical and Biomolecular Engineering)  
Katchen Lachmeyer (Sita group)  
Austin Gion (Geology)  
Xiaoying Lin (Fourkas group)  
Xiyuan Cheng (Y. Wang group)  
Junyan Zhang (D. Liu group, Chemical and Biomolecular Engineering)  
Miles Rewholdt (Zachariah group, Chemical Physics)  
Jiaheng Ruan (Vedernikov group)

#### II.B.4. Post-doctoral

Dr. Jacob Tosado, PhD from University of Maryland, January 2017 to May 2021,  
Currently at Oak Ridge National Laboratory as Research Associate

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

#### II.B.5. Other Directed Research

##### Louis Stokes Alliance for Minority Participation (LSAMP) Fellows

Allejandra Chavez, Summer 2020

Corleigh Forrester, Summer 2020

Isai Ramirez Gonzalez, Summer 2020

Hector Vivanco, Spring 2015-Spring 2017

##### High School Students

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)

#### II.C. Mentorship

##### II.C.1. Junior Faculty

Mentoring Committee for Lecturer Amanda Schech 2018-present

#### II.D. Advising: Other than Directed Research

##### II.D.1. Undergraduate

Faculty advisor of the *American Chemical Society UMD Student Affiliates*, undergraduate club for hosting seminars and performing outreach from Fall 2012 to 2018

II.D.2. Doctoral

Faculty advisor to the Dept. of Chemistry and Biochemistry's *Graduate Student Organization* from Fall 2016 to 2019

II.D.3. Other Advising Activities

Work with current chapter of Society of Chicanos/Hispanics and Native Americans in Science (SACNAS) to re-establish official status on campus and with the national organization.

**III. Service and Outreach**

III.A. Editorships, Editorial Boards, and Reviewing Activities

III.A.1. Reviewing Activities for Journals and Presses

|   |   |
|---|---|
| <i>Journal of American Chemical Society</i>   | <i>Chemistry of Materials</i>           |
| <i>Inorganic Chemistry</i>                    | <i>Journal of Solid State Chemistry</i> |
| <i>Journal of Materials Chemistry A and C</i> | <i>Nature Communications</i>            |
| <i>Nature Chemistry</i>                       | <i>Journal of Alloys and Compounds</i>  |
| <i>Chemical Communications</i>                | <i>Physical Review Letters</i>          |
| <i>Physical Review B</i>                      | <i>Physical Review Materials</i>        |
| <i>Journal of Physics: Condensed Matter</i>   |   |

III.A.2. Reviewing Activities for Agencies and Foundations

On-site reviewer for funding of research programs  
Argonne National Laboratories 2017 and 2020

Review panelist for National Science Foundation grant proposals  
Division of Materials Research 2015, 2016, 2019

Reviewer for Department of Energy, Basic Energy Sciences  
Science Graduate Student Research Program 2016, 2017, and 2018

Ad-hoc reviewer for NSF DMR grant proposals

Ad-hoc reviewer for DOE BES grant proposals

III.B. Committees, Professional & Campus Service

III.B.1. Campus Service – Department

|  |                         |
|--|-------------------------|
| Tobin J. Marks Lecture on Chemical Discovery, chair    | 2019-present            |
| Faculty Task Force Committee                           | 2020                    |
| <i>Ad hoc</i> committee for the new Chemistry Building | 2016-present            |
| Graduate Admissions Committee                          | 2013-2015,<br>2018-2020 |
| Chemistry Faculty Search Committee                     | 2019-2020               |

|               |   |              |
|---------------|---|--------------|
|               | Facilities, Space, and Resources Committee  | 2018-2020    |
|               | Curriculum Committee  | 2017-2019    |
|               | Graduate Awards Committee   | 2018-2019    |
|               | NSF GAANN Review Committee  | 2017         |
|               | Merit Pay and Awards Committee  | 2016-2017    |
|               | Faculty Advisory Committee  | 2014-2016    |
| III.B.2.      | Campus Service – University   |              |
|               | Senate Programs, Curricula, and Courses Committee   | 2018-2020    |
|               | Materials Science and Engineering Faculty Search Committee  | 2019-2020    |
|               | Aberration Corrected Electron Microscope Committee  | 2019-present |
|               | Interview Selection for Banneker-Key University Scholarships  | 2018, 2019   |
|               | Search Committee for Nanocenter Director  | 2017         |
| <u>III.C.</u> | <u>External Service and Consulting</u>  |              |
| III.C.1.      | Corporate and Other Board Memberships   |              |
|               | Member of the Board of Directors<br>American Institute of Physics   | 2020-present |
|               | Executive Committee,<br>Neutron Scattering Society of America   | 2021-present |
|               | Elected Member,<br>U.S. National Committee for Crystallography (USNC/Cr)  | 2020-present |
|               | Citrine Informatics Scientific Advisory Board   | 2017-2018    |
| <u>III.D.</u> | <u>Media Contributions</u>  |              |
| III.D.1.      | Digital Media   |              |
|               | Recorded a series of segments on high school chemistry topics in our laboratory<br>MacNeil-Lehrer Productions for <i>Discovery Education's Techbook</i> , an e-textbook.  |              |
| <u>III.E.</u> | <u>Community &amp; Other Service</u>  |              |
|               | Instructor for U.S. National Chemistry Olympiad, sponsored by the American Chemical Society. June 2020 and 2021   |              |
|               | Panelist for UMD's SACNAS (Society for Advancement of Chicanos/Hispanics and Native Americans in Science) Chapter with the Tiger Woods Foundation (TGR) to facilitate a conversation around the importance of elevating BIPOC and first-generation voices in the sciences. March 2021 |              |
|               | Alliance for Diversity in Science and Engineering, Young Researchers Conference. Gave a presentation on diversity and my own research. September 2017   |              |
|               | 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.