Curriculum Vitæ

Efrain E. Rodriguez, PhD.
Department of Chemistry and Biochemistry
University of Maryland, College Park, MD 20742
Tel: (301) 405-1541 email: efrain@umd.edu
www2.chem.umd.edu/groups/efrain

Academic appointments at UMD

Professor, Department of Chemistry and Biochemistry	June 2022 - present
Associate Professor, Department of Chemistry and Biochemistry	May 2018 – May 2022
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
Graduate Program Director for Chemistry,	Aug. 2018 – July 2021

Educational background

- National Research Council Post-Doctoral Fellow
  NIST Center for Neutron Research, National Institute of Standards and Technology
  Gaithersburg, MD 2009-2012
- PhD. Materials Science,
  Department of Materials
  University of California, Santa Barbara, CA 2009
- Graduate Research Assistant
  Los Alamos National Laboratories (LANL)
  Los Alamos, NM 2005-2008
- B.S. Materials Science,
  Department of Materials Science and Engineering
  Massachusetts Institute of Technology, Cambridge, MA 2003

Research fellowships, prizes and awards

Alexander von Humboldt Fellowship for Experienced Researchers	2022
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

Books and journal articles

88 publications, h-index = 29, i10-index = 55, citations: 2523 (from Google Scholar)

Book: *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

1. Diethrich, T. J.; Gnewuch, S.; Dold, K.; Taddei, K.; **Rodriguez, E. E**.*, "Tuning Magnetic Symmetry and Properties in the Olivine Series $Li_{1-x}Fe_xMn_{1-x}PO_4$ through Selective Delithiation", *Chemistry of Materials,* **2022,** *34,* 5039-5053[DOI: 10.1021/acs.chemmater.2c00372]

2. 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**, [DOI: doi.org/10.1021/acsanm.2c00693]
3. 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 $YbMn_xFe_{2-x}O_4$", *Materials Advances,* **2022**, *3*(2), 1087-110. [DOI:10.1039/D1MA00822F]
4. Li, T.; **Rodriguez, E. E.*,** "Mesoporous perovskite titanates via hydrothermal conversion", *Chemical Communications,* **2022**, *58*, 783-786. [DOI: 10.1039/D1CC05343D]
5. 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]
6. Diethrich, T. J.; Gnewuch, S.; Zavalij, P.Y.; **Rodriguez, E. E**.* "Orbital contribution to paramagnetism and non-innocent thiophosphate anions in layered $Li_2MP_2S_6$ where *M* = Fe, Co," *Inorganic Chemistry,* **2021**, *60*, 10280-10290. [DOI: 10.1021/acs.inorgchem.1c00710]
7. Gnewuch, S.; **Rodriguez, E. E**,*"Distinguishing the intrinsic antiferromagnetism in polycrystalline $LiCoPO_4$ and $LiMnPO_4$ Olivines." *Inorganic Chemistry*, **2020**, *59*, 5883-5895. [DOI: 10.1021/acs.inorgchem.9b03545]
8. 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 H_2O and D_2O in Hydrothermal Synthesis", *Chemistry of Materials*, **2020**, *32*, 765. [DOI: 10.1021/acs.chemmater.9b04121]
9. 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 ($Li_{1-x-y}Fe_xMn_yOD$)FeSe", *Physical Review Materials*, **2020**, 4, 034803. [DOI: 10.1103/PhysRevMaterials.4.034803]

Professional society leadership

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 Adv. of Chicanos/Hispanics and Native Americans in Science, faculty adviser

Courses taught

CHEM146: General Principles of Chemistry for Majors
CHEM271: General Chemistry and Energetics
CHEM401: Inorganic Chemistry
CHEM602: Advanced Inorganic Chemistry II
CHEM611: Professional Skills for Graduate Students
CHEM612: Scientific Presentations for Graduate Students

Symposia and workshops organized

- 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 *Materials Discovery and Crystal Growth*

American Crystallography Association National Meeting 2015, Philadelphia, PA

- "*Neutron Day"*
  Full day symposium on collaborations between UMCP and NIST 2015, College Park, MD
- Symposium on *Materials Characterization with Neutrons*
  XXII International Materials Research Congress 2013, Cancun, Mexico
- *Fundamentals of Quantum Materials,* co-organizer
  6-day workshop and school on Synthesis of Quantum Materials 2017-2022, College Park, MD
- *School on Representational Analysis and Magnetic Structures, co-organizer*
  4-day school on solving magnetic structures with neutron data 2015, 2018, 2021

Plenary talks

- *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

Sponsored research and programs

- Department of Energy, Basic Energy Sciences, DESC-0016434
  "Exploring 2D magnetism in van der Waals materials with polarized neutron scattering"
  08/01/2022 to 7/31/2025
- National Science Foundation, Division of Materials Research, DMR-2113682
  "Non-centrosymmetric Quantum Materials through Metal-amine Complexes"
  05/01/2021 to 04/30/2024
- Department of Energy, Basic Energy Sciences, DESC-0016434
  "Discovering Toroidal Materials with Spherical Neutron Polarimetry"
  08/01/2019 to 7/31/2022
- Department of Energy, Basic Energy Sciences, DESC-0016434
  "The Next Ferroic Order: Synthesis and Neutron Scattering of Ferrotoroidic Materials"
  08/01/2016 to 7/31/2019
- National Science Foundation, Division of Materials Research, DMR-1455118
  "CAREER: Designing Hund's Metals from Transition Metal Sulfides"
  4/01/2015 to 3/31/2020
- 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"
  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)
  10/04/2018 to 10/03/2021
- Department of Commerce, 70NANB15H261
  "UMD / NIST Center for the Application of Neutron Scattering
  PI Robert Briber (MSE) and co-PIs: Johnpierre Paglione (Physics), Efrain E. Rodriguez (Chem & Biochem), and Ichiro Takeuchi (MSE) and
  09/01/2017 to 08/31/2022
- Air Force Office of Science Research, FA-95501410332
  "Exploration and Development of Advanced Superconducting Materials"
  PI Johnpierre Paglione (Physics) and co-PIs: Richard L. Greene (Physics), Efrain E. Rodriguez (Chem & Biochem), and Ichiro Takeuchi (MSE)
  08/01/2014 to 09/14/2019