

CHRISTOPHER P. RHODES

Curriculum Vitae

Associate Professor

Department of Chemistry and Biochemistry

Materials Science and Engineering Program

Texas State University, 601 University Dr., San Marcos, TX 78666

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Research Experience and Interests

Nanomaterials, transition metal oxides/hydroxides, spectroscopy, electrochemistry, intercalation electrodes, electrocatalysis, batteries, fuel cells, electrolyzers

1. Education and Appointments

Education

- 2002–5 Postdoctoral Research Associate, Materials Science and Engineering, University of California, Los Angeles, CA, Advisor: Dr. Bruce Dunn and Joint Appointment at the U. S. Naval Research Laboratory, Washington DC, Advisor: Dr. Debra Rolison
- 2001 Ph. D. Chemistry, University of Oklahoma, Norman, OK
Dissertation Title: “*Crystalline and Amorphous Phases in Polymer Electrolytes and Model Systems*”; Research Advisor: Dr. Roger Frech
- 2000 M. S. Chemistry, University of Oklahoma, Norman, OK (3.9/4.0)
- 1992 B. A. Chemistry, Texas A&M University, College Station, TX (Magna Cum Laude) (3.8/4.0)

Appointments

- 2019–present Associate Professor, Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX
- 2014–present Graduate Faculty, Materials Science, Engineering, and Commercialization Program, Texas State University, San Marcos, TX
- 2014–2019 Assistant Professor, Department of Chemistry and Biochemistry, Texas State University, San Marcos, TX
- 2011–2014 Chief Technologist, Energy and Power, Lynntech, Inc., College Station, TX
- 2010–2011 Senior Research Scientist, Lynntech, Inc., College Station, TX
- 2005–2010 Research Scientist, Lynntech, Inc., College Station, TX
- 2002–2005 Contractor, Naval Research Laboratory, Washington, DC
- 2002–2005 Postdoctoral Research Associate, UCLA, Los Angeles, CA
- 1996–2001 Research Assistant, University of Oklahoma, Norman, OK
- 1993–1996 Science Instructor, Rough Rock High School, Rough Rock, AZ

2. Research Activities

2. A. *Peer-Reviewed Publications (45 publications, 8 conference proceedings, over 1800 citations)*

(† represents graduate students, ‡ represents undergraduate students, § represents postdocs, § represents postdocs, ¥ represents high school students, * represents corresponding author):

Peer-reviewed publications as an Associate Professor at Texas State University (Sept. 2019-present)

- 1) Kimmel, S.W.†; Kuykendall, V.‡; Mough, C.‡; Landry, A.¥; **Rhodes, C.P.*** Effect of Microwave Synthesis Conditions on the Structure of Nickel Hydroxide Nanosheets. *Journal of Visualized Experiments* **2023**, 198, e65412. DOI: [10.3791/65412](https://doi.org/10.3791/65412) (Impact Factor: 1.42).

- 2) Kimmel, S.W.[†]; Koehne, B.D.; Gibson, B.[‡]; Geerts, W.J.; Theodoropoulou, N.*; **Rhodes, C.P.*** Structure and Magnetism of Iron-Substituted Nickel Hydroxide Nanosheets. *Magnetochemistry* **2023**, *9*, 25. DOI: [10.3390/magnetochemistry9010025](https://doi.org/10.3390/magnetochemistry9010025) (Impact Factor: 3.34).
 - Selected by the editors as the issue cover for *Magnetochemistry*, Volume 9, Issue 1 (January 2023) <https://www.mdpi.com/2312-7481/9/1>
 - Feature Article in *Special Issue: Advances in Magnetic Nanomaterials and Nanostructures*
- 3) Godínez-Salomón, J. F.[§]; Ospina-Acevedo, F.; Albiter, L.A.[†]; Bailey, K.O.[‡]; Naymik, Z.G.[†]; Mendoza-Cruz, R.; Balbuena, P.B.*; **Rhodes, C.P.*** Titanium Substitution Effects on the Structure, Activity, and Stability of Nanoscale Ruthenium Oxide Oxygen Evolution Electrocatalysts: Experimental and Computational Study. *ACS Applied Nano Materials* **2022**, *5*, 11752-11775. DOI: [10.1021/acsnm.2c02760](https://doi.org/10.1021/acsnm.2c02760) (Impact Factor: 6.03).
- 4) Camacho-Forero, L.E.; Godínez-Salomón, F.[§]; Ramos-Sánchez, G.; **Rhodes, C.P.***; Balbuena, P.B.* Theoretical and Experimental Study of the Effects of Cobalt and Nickel Doping within IrO₂ on the Acidic Oxygen Evolution Reaction. *Journal of Catalysis* **2022**, *408*, 64-80. DOI: [10.1016/j.jcat.2022.02.016](https://doi.org/10.1016/j.jcat.2022.02.016) (Impact Factor: 7.35).
- 5) Kimmel, S.W.[†]; Hopkins, B.J.; Chervin, C.N.; Skeelee, N. L.; Ko, J.S.; DeBlock, R.H.; Long, J.W.; Parker, J.F.; Hudak, B.M.; Stroud, R.M.; Rolison, D.R.; **Rhodes, C.P.*** Capacity and Phase Stability of Metal-Substituted α -Ni(OH)₂ Nanosheets in Aqueous Ni-Zn Batteries, *Materials Advances* **2021**, *2*, 3060-3074. DOI: [10.1039/D1MA00080B](https://doi.org/10.1039/D1MA00080B) (Impact Factor: 5.0).
- 6) Ying, Y.[†]; Godínez-Salomón, J.F.[§]; Moreno, A.[‡]; Lartundo-Rojas, L.; Meyer, B.[‡]; Damin, C.A.; **Rhodes, C.P.*** Hydrous Cobalt-Iridium Oxide Two-Dimensional Nanoframes: Insights into Activity and Stability of Bimetallic Acidic Oxygen Evolution Electrocatalysts. *Nanoscale Advances* **2021**, *3*, 1976-1996. DOI: [10.1039/D0NA00912A](https://doi.org/10.1039/D0NA00912A) (Impact Factor: 5.17).
- 7) Harper-Leatherman, A.S.; Wallace, J.M.; Long, J.W.; **Rhodes, C.P.**; Graffam, M.E.; Abunar, B.H.; Rolison, D.R. Redox Cycling within Nanoparticle-Nucleated Protein Superstructures: Electron Transfer between Nanoparticulate Gold, Molecular Reductant, and Cytochrome c. *Journal of Physical Chemistry B* **2021**, *125*, 1735-1745. DOI: [10.1021/acs.jpcc.0c09688](https://doi.org/10.1021/acs.jpcc.0c09688) (Impact Factor: 3.47).
- 8) Godínez-Salomón, F.[§]; Albiter, L.A.[†]; Mendoza-Cruz, R.; **Rhodes, C.P.*** Bimetallic Two-dimensional Nanoframes: High Activity Acidic Bifunctional Oxygen Reduction and Evolution Electrocatalysts. *ACS Applied Energy Materials* **2020**, *3*, 2404-2421. <http://dx.doi.org/10.1021/acsaem.9b02051> (Impact Factor: 5.80).

Peer-reviewed publications as an Assistant Professor at Texas State University (Sept. 2014-Sept. 2019)

- 9) Godínez-Salomón, F.[§]; Albiter, L.A.[‡]; Alia, S.M.; Pivovar, B.S.; Camacho-Forero, L.E.; Balbuena, P.B.; Mendoza-Cruz, R.; Arellano-Jimenez, M.J.; **Rhodes, C.P.*** Self-Supported Hydrous Iridium-Nickel Oxide Two-dimensional Nanoframes for High Activity Oxygen Evolution Electrocatalysts. *ACS Catalysis* **2018**, *8*, 10498-10520. DOI: [10.1021/acscatal.8b02171](https://doi.org/10.1021/acscatal.8b02171) (Impact Factor: 11.38).
- 10) Reyes, C.; Somogyi, R.; Niu, S.[†]; Catenacci, M.; Cruz, M.; **Rhodes, C.P.**; Wiley, B.J.* Three-Dimensional Printing a Complete Lithium Ion Battery with Fused Filament Fabrication. *ACS Applied Energy Materials* **2018**, *1*, 5268-5279. DOI: [10.1021/acsaem.8b00885](https://doi.org/10.1021/acsaem.8b00885) (Impact Factor: 4.473).
- 11) Duraia, E.M.*; Niu, S.[†]; Beall, G.W.; **Rhodes, C.P.*** Humic Acid-Derived Graphene-SnO₂ Nanocomposites for High Capacity Lithium-Ion Battery Anodes. *Journal of Materials Science: Materials in Electronics* **2018**, *29*, 8456-8464. DOI: [10.1007/s10854-018-8858-x](https://doi.org/10.1007/s10854-018-8858-x) (Impact Factor: 2.019).
- 12) Niu, S.[†]; McFeron, R.[‡]; Godínez-Salomón, F.[§]; Chapman, B.S.; Damin, C.A.; Tracy, J.B.; Augustyn, V.; **Rhodes, C.P.*** Enhanced Electrochemical Lithium-Ion Charge Storage of Iron Oxide Nanosheets. *Chemistry of Materials* **2017**, *9*, 7794-7807. DOI: [10.1021/acs.chemmater.7b02315](https://doi.org/10.1021/acs.chemmater.7b02315) (Impact Factor: 9.47).

- 13) Perera, S.D.[§]; Archer, R.[†]; Damin, C.A.; Mendoza-Cruz, R.; **Rhodes, C.P.*** Controlling Interlayer Interactions in Vanadium Pentoxide-Poly(ethylene oxide) Nanocomposites for Enhanced Magnesium-ion Charge Transport and Storage. *Journal of Power Sources* **2017**, 343, 580-591. [DOI:10.1016/j.jpowsour.2017.01.052](https://doi.org/10.1016/j.jpowsour.2017.01.052) (Impact Factor: 6.33)
- 14) Godínez-Salomón, F.[§]; Mendoza-Cruz, R.; Arellano-Jimenez, M.J., Jose-Yacaman, M.; **Rhodes, C.P.***; Metallic Two-dimensional Nanoframes: Design of Carbon-free Hierarchical Nickel-Platinum Alloy Electrocatalyst Nanoarchitecture with Enhanced Oxygen Reduction Activity and Stability, *ACS Applied Materials & Interfaces*, **2017**, 9, 18660-18674. [DOI: 10.1021/acsami.7b00043](https://doi.org/10.1021/acsami.7b00043) (Impact Factor: 7.14)
- 15) Godínez-Salomón, F.[§]; **Rhodes, C.P.***; Alcantara, K.S.; Zhu, Q.; Canton, S.E.; Calderon, H.A.; Reyes-Rodríguez, J.L.; Leyva, M.A.; Solorza-Feria, O.*. Tuning the Oxygen Reduction Activity and Stability of Ni(OH)₂@Pt/C Catalysts through Controlling Pt Surface Composition, Strain, and Electronic Structure. *Electrochimica Acta* **2017**, 247, 958-969. [DOI: 10.1016/j.electacta.2017.06.073](https://doi.org/10.1016/j.electacta.2017.06.073) (Impact Factor: 4.80)
- 16) Stein, M.; Chen, C.; Mullings, M.; Jamie, D.J.[‡]; Zaleski, A.[‡]; Mukherjee, P.; **Rhodes, C.P.*** Probing the Effect of High Energy Ball Milling on the Structure and Properties of LiNi_{1/3}Mn_{1/3}Co_{1/3}O₂ Cathodes. *Journal of Electrochemical Energy Conversion and Storage* **2016**, 13, 031001. [DOI:10.1115/1.4034755](https://doi.org/10.1115/1.4034755) (Impact Factor: 0.75)
- 17) Dearnorff, C.L. Sikma, R.E.; **Rhodes, C.P.**; Hudnall, T.W. Carbene-derived α -Acyl Iminium Cations: Organic Molecules with Readily Tunable Multiple Redox Processes. *Chemical Communications*, **2016**, 52, 9024-9027. [DOI: 10.1039/c5cc06322a](https://doi.org/10.1039/c5cc06322a) (Impact Factor: 6.83)
- 18) Stein, M.; Chen, C.; Robles, D.J.; **Rhodes, C.P.**; Mukherjee, P.* Non-Aqueous Electrode Processing and Construction of Lithium-ion Coin Cells. *Journal of Visualized Experiments* **2016**, 180, e53490. [DOI:10.3791/53490](https://doi.org/10.3791/53490) (Impact Factor: 1.33)
- 19) Stuart, J.; Hohenadel, A.; Li, X.; Xiao, H.; Parkey, J.; **Rhodes, C.P.***; Licht, S.* The Net Discharge Mechanism of the VB₂/Air Battery. *Journal of the Electrochemical Society* **2015**, 162, A1-A6. [DOI: 10.1149/2.0801501jes](https://doi.org/10.1149/2.0801501jes) (Impact Factor: 2.86)
- 20) Stuart, J.; Lefler, M.; **Rhodes, C.P.***; Licht, S. High Energy Capacity TiB₂/VB₂ Composite Metal Boride/Air Battery. *Journal of the Electrochemical Society* **2015**, 162, A432-A436. [DOI: 10.1149/2.0721503jes](https://doi.org/10.1149/2.0721503jes) (Impact Factor: 2.86)

Peer-reviewed publications prior to becoming a faculty member at Texas State University

- 21) **Rhodes, C.P.**; Stuart, J.; Lopez, R.; Li, X.; Waje, M.; Mullings, M.; Lau, J.; Licht, S. Evaluation of Properties and Performance of Nanoscopic Materials in Vanadium Diboride/Air Batteries. *Journal of Power Sources* **2013**, 239, 244-252. [DOI: 10.1016/j.jpowsour.2013.03.071](https://doi.org/10.1016/j.jpowsour.2013.03.071) (Impact Factor: 5.21)
- 22) Stuart, J.; Lopez, R.; Lau, J.; Li, X.; Waje, M.; Mullings, M.; Rhodes, C.; Licht, S.*. Fabrication of VB₂/Air Cells for Electrochemical Testing. *Journal of Visualized Experiments* **2013**, 78, e50593. DOI: 10.3791/50593 (Impact Factor: N/A)
- 23) **Rhodes, C. P.**; Long, J. W.; Pettigrew, K. A.; Stroud, R. M.; Rolison, D. R., Architectural Integration of the Components Necessary for Electrical Energy Storage on the Nanoscale and in 3D. *Nanoscale* **2011**, 3, 1731-1740. [DOI: 10.1039/c0nr00731e](https://doi.org/10.1039/c0nr00731e) (Impact Factor: 6.74)
- 24) Kim, J.*; Parkey, J.; **Rhodes, C.**; Gonzalez-Martin, A. Development of a Biofuel Cell Using Glucose-oxidase- and Bilirubin-oxidase-based Electrodes. *Journal of Solid State Electrochemistry* **2009**, 13, 1043-1050. [DOI: 10.1007/s10008-008-0725-x](https://doi.org/10.1007/s10008-008-0725-x) (Impact Factor: 2.23)
- 25) Rolison, D. R.; Long, R. W.; Lytle, J. C.; Fischer, A. E.; **Rhodes, C. P.**; McEvoy, T. M.; Bourga, M. E.; Lubers, A. M., Multifunctional 3D Nanoarchitectures for Energy Storage and Conversion. *Chemical Society Reviews* **2009**, 38, 226-252. [DOI: 10.1039/b801151f](https://doi.org/10.1039/b801151f) (Impact Factor: 30.43)
- 26) Gonzalez-Martin, A.; Ozdemir, K.; **Rhodes, C.**; Hennings, B.; Tennakoon, C.; McGinnis, J. Kim J.* Simultaneous TOC reduction and biofouling prevention in BWP processed water. *SAE International Journal of Aerospace* **2008**, 1, 454-460. (Impact Factor: N/A)

- 27) Lytle, J. C.; **Rhodes, C. P.**; Long, J. W.; Pettigrew, K. A.; Stroud, R. M.; Rolison, D. R., The Importance of Combining Disorder with Order for Li-Ion Insertion into Cryogenically Prepared Nanoscopic Ruthenia. *Journal of Materials Chemistry* **2007**, 17, 1292-1299. DOI: [10.1039/B614433K](https://doi.org/10.1039/B614433K) (Impact Factor: 5.97)
- 28) Doescher, M. S.; Pietron, J. J.; Dening, B. M.; Long, J. W.; **Rhodes, C. P.**; Edmondson, C. A.; Rolison, D. R., Using an Oxide Nanoarchitecture to Make or Break a Proton Wire. *Analytical Chemistry* **2005**, 77, 7924-7932. DOI: [10.1021/ac051168b](https://doi.org/10.1021/ac051168b) (Impact Factor: 5.86)
- 29) **Rhodes, C.P.**; Long, J. W.; Rolison, D. R.; Direct Electrodeposition of Nanoscale Solid Polymer Electrolytes via Electropolymerization of Sulfonated Phenols, *Electrochemical and Solid-State Letters* **2005**, 8, A579-A584. DOI: [10.1149/1.2050508](https://doi.org/10.1149/1.2050508) (Impact Factor: 2.15)
- 30) **Rhodes, C.P.**; Long, J. W.; Doescher, M.S.; Fontanella, J.J.; Rolison, D. R.; Nanoscale Polymer Electrolytes: Ultrathin Electrodeposited Poly(phenylene oxide) with Solid-State Ionic Conductivity, *Journal of Physical Chemistry B* **2004**, 108, 13079-13087. DOI: [10.1021/jp047671u](https://doi.org/10.1021/jp047671u) (Impact Factor: 3.38)
- 31) **Rhodes, C.P.**; Long, J. W.; Doescher, M.S.; Dening, B.M.; Rolison, D. R.; Charge insertion into hybrid nanoarchitectures: Mesoporous Manganese Oxide Coated with Ultrathin Poly(phenylene oxide), *Journal of Non-Crystalline Solids* **2004**, 350, 73-79. DOI: [10.1016/j.jnoncrysol.2004.06.050](https://doi.org/10.1016/j.jnoncrysol.2004.06.050) (Impact Factor: 1.72)
- 32) Long, J. W.; Logan, M. S.; **Rhodes, C. P.**; Carpenter, E. E.; Stroud, R. M.; Rolison, D. R., Nanocrystalline Iron Oxide Aerogels as Mesoporous Magnetic Architectures. *Journal of the American Chemical Society* **2004**, 126, 16879-16889. DOI: [10.1021/ja046044f](https://doi.org/10.1021/ja046044f) (Impact Factor: 11.44)
- 33) Long, J. W.; **Rhodes, C. P.**; Young, A. L.; Rolison, D. R. Ultrathin, protective coatings of poly(o-phenylenediamine) as electrochemical proton gates: Making mesoporous MnO₂ nanoarchitectures stable in acid electrolytes. *Nano Letters* **2003**, 3, 1155-1161. DOI: [10.1021/nl0343598](https://doi.org/10.1021/nl0343598) (Impact Factor: 13.03)
- 34) **Rhodes, C. P.**; Kahn, M.; Frech, R. Crystalline phases of poly(ethylene oxide) oligomers with sodium triflate: Changes in coordination and conformation with chain length, *Journal of Physical Chemistry B* **2002**, 106, 10330-10337. DOI: [10.1021/jp0141981](https://doi.org/10.1021/jp0141981) (Impact Factor: 3.38)
- 35) Dong, H. T.; Hyun, J. K.; **Rhodes, C. P.**; Frech, R.; Wheeler, R. A.*, Molecular dynamics simulations and vibrational spectroscopic studies of local structure in tetraglyme:sodium triflate (CH₃O(CH₂CH₂O)₄CH₃:NaCF₃SO₃) solutions, *The Journal of Physical Chemistry B* **2002**, 106, 4878-4885. (Impact Factor: 3.38)
- 36) Frech, R.*; **Rhodes, C.P.**; Khan, M. A comparison of local structures in crystalline P(EO)₃LiCF₃SO₃ and glyme-LiCF₃SO₃ systems, *Macromolecular Symposia* **2002**, 186, 41-49. (Impact Factor: N/A)
- 37) Frech, R.*; **Rhodes, C. P.** A symmetry-based study of vibrational decoupling in the crystalline phases of CH₃(OCH₂CH₂)₂OCH₃LiCF₃SO₃ and P(EO)₃LiCF₃SO₃, *Solid State Ionics* **2002**, 147, 259-264. (Impact Factor: 2.11)
- 38) **Rhodes, C.P.**; Frech, R.; Local structures in crystalline and amorphous phases of diglyme-LiCF₃SO₃ and poly(ethylene oxide)-LiCF₃SO₃ systems: Implications for the mechanism of ionic transport, *Macromolecules* **2001**, 34, 2660-2666. DOI: [10.1021/ma001749x](https://doi.org/10.1021/ma001749x) (Impact Factor: 5.93)
- 39) Grady, B.P; **Rhodes, C. P.**; York, S.; Frech, R. Effect of temperature on local structure in poly(ethylene oxide)-zinc bromide salt complexes, *Macromolecules* **2001**, 34, 8523-8531. DOI: [10.1021/ma010210b](https://doi.org/10.1021/ma010210b) (Impact Factor: 5.93)
- 40) Petrowsky, M.; **Rhodes, C. P.**; Frech, R.*, Vibrational Spectroscopic Study of 2-Methoxyethyl Ether Complexed with Lithium and Sodium Trifluoromethanesulfonate. *Journal of Solution Chemistry* **2001**, 30, 171-181. (Impact Factor: 1.08)
- 41) Hyun, J. K.; Dong, H. T.; **Rhodes, C. P.**; Frech, R.; Wheeler, R. A.*, Molecular Dynamics Simulations and Spectroscopic Studies of amorphous tetraglyme (CH₃O(CH₂CH₂O)₄CH₃) and

- tetraglyme:LiCF₃SO₃ structures. *Journal of Physical Chemistry B* **2001**, 105, 3329-3337. (Impact Factor: 3.38)
- 42) **Rhodes, C. P.**; Frech, R. Vibrational analysis of the polymer electrolyte poly(ethylene oxide)₆:LiAsF₆, *Macromolecules* **34**, **2001**, 34,1365–1368. DOI: [10.1021/ma0008387](https://doi.org/10.1021/ma0008387) (Impact Factor: 5.93)
- 43) **Rhodes, C. P.**; Frech, R.* A symmetry-based analysis of Raman and infrared spectra of the compounds (poly(ethylene oxide))₃LiCF₃SO₃ and (poly(ethylene oxide))NaCF₃SO₃, C. P. Rhodes and R. Frech, *Solid State Ionics* **2000**, 136-137, 1131–1137. (Impact Factor: 2.11)
- 44) **Rhodes, C. P.**; Klassen, B.; Frech, R.; Dai, Y.; Greenbaum, S. G.* Studies of cation-anion and cation-polymer association in poly(ethylene oxide): Pb(CF₃SO₃)₂ complexes, C. P. Rhodes, B. Klassen, R. Frech, Y. Dai, and S. G. Greenbaum. *Solid State Ionics* **1999**, 126, 251-257. DOI: 10.1016/S0167-2738(99)00238-6 (Impact Factor: 2.11)
- 45) **Rhodes, C. P.**; Frech, R.* Cation–anion and cation–polymer interactions in (PEO)_nNaCF₃SO₃ (n=1-80), C. P. Rhodes and R. Frech, *Solid State Ionics* **1999**, 121, 91–99. DOI: 10.1016/S0167-2738(98)00534-7 (Impact Factor: 2.11)

B. Conference Proceedings

- 1) Kimmel, S.W.[†]; DeBlock, R.H.; Manley, J.A.[‡]; Gibson, B.M.[‡]; Silguero, C.M.[‡]; Rolison, D.R.*; **Rhodes, C.P.*** Designing High Discharge Capacity and High-Rate Nickel Hydroxide Cathodes for Alkaline Rechargeable Ni–Zn Batteries. *Proceedings of the 49th Power Sources Conference 2023*, in the press.
- 2) Reeh, J.; Nelson, M.; **Rhodes, C.P.**; Hennings, B. Safe Energy System that Allows Enhanced UUV Missions. *46th Power Sources Conference Proceedings, 2014*, 163-165 (Las Vegas, NV, June 9–12, 2014).
- 3) Licht, S.*; Hettige, C.; Lau, J.; Stuart, J.; Lopez, R.; Mullings, M.; **Rhodes, C.P.*** High energy density vanadium boride–air batteries, *45th Power Sources Conference 2012*, 141-143 (Las Vegas, NV, June 11–14 2012).
- 4) Bestaoui-Spurr, N.; Adams, T.; **Rhodes, C.**; Edmondson, C.A.; Fontanella, J.J.; Wintersgill, M. C. Polymer nanocomposites for high energy storage capacitors, *Proceedings of the ASME 2010 Conference on Smart Materials, Adaptive Structures and Intelligent Systems, 2010* (Philadelphia, Pennsylvania, 28 September – 1 October 2010).
- 5) Mullings, M.; **Rhodes, C.P.*** Advanced electrolytes for extreme temperature supercapacitors, *44th Power Sources Conference 2010, 2010*, 589-592 (Las Vegas, NV, 14–17 June 2010).
- 6) Fu, Y.; **Rhodes, C.P.*** Advanced Electrode Materials for High Power Density Batteries and Supercapacitors, *44th Power Sources Conference 2010, 2010*, 612-614 (Las Vegas, NV, 14–17 June 2010).
- 7) **Rhodes, C.P.**; Dong, W.; Long, J.W.; Rolison, D.R. Controlling defects in nanostructured V₂O₅: Spectroelectrochemical characterization, in *Solid State Ionics VI*, E. D. Wachsman, K. E. Swider-Lyons, M. F. Carolan, F. H. Garzon, M. Liu, and J. R. Stetter, Eds., PV2002-26, Electrochemical Society: Pennington, NJ, **2003**, 478–489.
- 8) Frech, R.; **Rhodes, C.P.**; York, S.S. A comparative study of ionic association in poly(ethylene oxide)-MCF₃SO₃ systems (M=lithium and sodium). *Mater. Res. Soc. Symp. Proc.* **548**, 335–345 (1999).

C. Presentations (40 invited presentations, 109 contributed presentations)

C.1. Invited Talks, Lectures, and Presentations

([†] represents graduate students, [‡] represents undergraduate students, [§] represents postdocs, * represents corresponding author, underline represents presenting author)

Invited talks since as an Associate Professor at Texas State University (September 2019-present)

- 1) **Rhodes, C.P.*** How to Plan and Conduct Research for a Publication or Presentation: How to be More Efficient and Effective, *Seminar to Texas State PREM Center for Intelligent Materials Assembly (CIMA)*, San Marcos, TX, September 29, 2023 (oral).
- 2) **Rhodes, C.P.*** Private Sector Careers in Chemistry & Biochemistry: Perspectives and Opportunities, *Texas State Research Experiences for Undergraduates Program Seminar*, Texas State University, San Marcos, TX, July 20, 2023 (oral).
- 3) **Rhodes, C.P.*; Kimmel, S.[†]**; Rolison, D.R.; DeBlock, R. Three-Dimensional Nickel Hydroxide Cathodes for Energy Dense, Safe Nickel–Zinc Batteries, *Navy Undersea Research Program (NURP) Review*, Arlington, VA, June 6-8, 2023 (oral).
- 4) **Rhodes, C.P.*** Research Productivity and Planning: Perspectives and Strategies, *Seminar to Texas State PREM Center for Intelligent Materials Assembly (CIMA)*, April 21, 2023 (oral).
- 5) **Rhodes, C.P.*; Kimmel, S.W.[†]**; Rolison, D.R.; DeBlock, R. Three-Dimensional Nickel Hydroxide Cathodes for Energy Dense, Safe Nickel–Zinc Batteries, *Undersea Power and Energy Program Review*, Arlington, VA, March 14-16, 2023 (oral).
- 6) **Rhodes, C.P.*** Unitized Regenerative Fuel Cells for Undersea Refuelable Unmanned Undersea Vehicles, *Undersea Power and Energy Program Review*, Arlington, VA, March 14-16, 2023 (oral).
- 7) **Rhodes, C.P.*** Nanostructured Bimetallic Oxides: Designing Active, Stable and Accessible Materials for Batteries and Water Splitting, *Department Seminar, Department of Chemical Engineering, University of Texas at San Antonio (UTSA)*, San Antonio, TX, February 10, 2023 (oral).
- 8) **Rhodes, C.P.*** Developing a Research Elevator Pitch, *Texas State Research Experiences for Undergraduates Program Seminar*, Texas State University, July 26, 2022 (oral).
- 9) **Kimmel, S.[†]**; Rolison, D.R.; **Rhodes, C.P.*** Three-Dimensional Nickel Hydroxide Cathodes for Energy Dense, Safe Nickel–Zinc Batteries, *Navy Undersea Research Program (NURP) Review*, University of Rhode Island, South Kingstown, RI, June 8, 2022 (oral).
- 10) **Rhodes, C.P.*** Nanostructured Bimetallic Oxides: Designing Active, Stable and Accessible Materials for Batteries and Water Splitting, *Invited Seminar to UT Austin Materials Research Science and Engineering Center (MRSEC): Center for Dynamics and Control of Materials*, Virtual, April 28, 2022 (oral).
- 11) **Rhodes, C.P.*; Kimmel, S.[†]**; Rolison, D.R. Nanostructured α -Ni(OH)₂ Cathodes for High Energy Density Rechargeable Nickel–Zinc Batteries, *Nickel-Zinc Symposium - Military Power Sources Committee, Virtual Meeting*, April 14, 2022 (oral).
- 12) **Rhodes, C.P.*** Research Productivity and Planning: Perspectives and Strategies, *Seminar to Texas State PREM Center for Intelligent Materials Assembly (CIMA)*, March 25, 2022 (oral).
- 13) **Rhodes, C.P.*; Kimmel, S.[†]**; Rolison, D.R.; High-Capacity Cathodes for Energy Dense, Safe, Nickel–Zinc Batteries, *Briefing to Navy Unmanned Maritime Systems Program Office (PMS-406)*, Virtual Meeting, June 23, 2021 (oral).
- 14) **Kimmel, S.**; Rolison, D.R.; **Rhodes, C.P.*** Nanoarchitected Nickel Hydroxide Cathodes for Energy Dense, Safe, Rechargeable Nickel–Zinc Batteries, *Navy Undersea Research Program Review*, Virtual Meeting, June 3, 2021 (oral).

- 15) Rolison, D.R.*; Kimmel, S.†; **Rhodes, C.P.**; Chervin, C.; Skeeel, N.L.; Long, J.W.; Parker, J.F. With High-performance Two-electron, Dendrite-suppressing Zinc Anodes in Hand, Time for Battery Cathodes to Catch Up, Invited talk in EN03: Intercalation Energy Storage Materials & Systems for Beyond Li-Ion Batteries, *Spring Meeting of the Materials Research Society*, Seattle, WA (Virtual Meeting), April 18-23, 2021 (oral).
- 16) **Rhodes, C.P.**; Nanostructured Transition Metal Oxides for Energy Storage and Conversion: Creating Surfaces that are Electrochemically Active, Stable and Accessible, *Society for the Advancement of Material and Process Engineering (SAMPE), South Texas Chapter, Guest Lecture*, Virtual, December 11, 2020 (oral).
- 17) Kimmel, S.†; Rolison, D.R.; **Rhodes, C.P.*** Nanoarchitected Nickel Hydroxide Cathodes for Energy Dense, Safe, Rechargeable Nickel–Zinc Batteries, *Navy Undersea Research Program (NURP) Program Review*, Virtual Meeting, June 4, 2020 (oral).
- 18) Rolison, D.R.; Hopkins, B.; Ko, J.S.; Sassin, M.; Chervin, C.; Parker, J.F.; Long, J.W.; Kimmel, S.†; **Rhodes, C.P.** Uniformly Reacting Electrodes Simplify Cell Engineering: The Case for Architectural Design, *Fall Meeting of the Material Research Society* (Symposium EN01: Challenges in Battery Technologies for Next-Generation Electric Vehicles and Grid Storage Applications), Boston, MA, December 1–6, 2019 (oral).
- 19) Balbuena, P. B.*, Camacho-Forero, L.E.; Godínez-Salomón, F.§; **Rhodes, C.P.** Oxygen Evolution Reaction on M-Iridium Oxide (M=Ni, Co) Surfaces: Insights from First-Principles Computations and Experiments, *236th Electrochemical Society Meeting* (Symposium I01: Polymer Electrolyte Fuel Cells and Electrolyzers 19 (Section F), Abstract No. #127855), Atlanta, Georgia, October 13-17, 2019 (oral).

Invited talks as an Assistant Professor at Texas State University (Sept. 2014-Sept. 2019)

- 20) **Rhodes, C.P.*** Nanoframe Bifunctional Oxygen Electrodes for Unitized Regenerative Fuel Cells, *Office of Naval Research (ONR) Undersea Energy and Propulsion Review*, Alexandria, VA, April 3, 30, 2019 (oral).
- 21) **Rhodes, C.P.*** Writing a Small Business Innovative Research (SBIR) Phase I Proposal: Principles and Strategies” *Materials Science, Engineering, and Commercialization Program Student Presentation*, Texas State University, San Marcos, TX, April 9, 2019 (oral).
- 22) **Rhodes, C.P.*** Career Opportunities for Chemists, *Seminar for Incoming Chemistry Majors*, Department of Chemistry, Texas A&M University, College Station, TX, November 1, 2018 (oral).
- 23) **Rhodes, C.P.*** Two-Dimensional Nanoarchitectures: Creating Surfaces that are Electrochemically Active, Stable and Accessible, *Department Seminar*, Washington University in St. Louis, St. Louis, Missouri, August 7, 2018 (oral).
- 24) **Rhodes, C.P.*** Perspectives on Being a Chemist in Industry” *Texas State Research Experience for Undergraduates (REU) Seminar*, Texas State University, San Marcos, TX, July 3, 2018 (oral).
- 25) **Rhodes, C.P.*** Nanoframe Bifunctional Oxygen Electrodes for Unitized Regenerative Fuel Cells”, *ONR Undersea Energy and Propulsion Review*, Arlington, VA, April 10-12, 2018 (oral).
- 26) **Rhodes, C.P.*** Two-Dimensional Nanoarchitectures for Energy Storage and Conversion” *Department Seminar*, George Washington University, Washington, D.C., March 9, 2018 (oral).
- 27) **Rhodes, C.P.*** Writing a Winning Small Business Innovative Research (SBIR) Phase I Proposal” *Materials Science, Engineering, and Commercialization Program Student Presentation*, Texas State University, San Marcos, TX, December 9, 2017 (oral).
- 28) **Rhodes, C.P.*** Using Two-Dimensional Nanoarchitectures to Enhance Energy Storage and Conversion Materials”, *Department Seminar*, Texas Lutheran University, Seguin, Texas, October 27, 2017 (oral).

- 29) **Rhodes, C.P.*** Nanoframe Bifunctional Oxygen Electrodes for Unitized Regenerative Fuel Cells”, *ONR Undersea Energy and Propulsion Review*, Arlington, VA, March 28-30, 2017 (oral).
- 30) **Rhodes, C.P.*** “Using Two-dimensional (2D) Materials to Enhance Electrochemical Energy Storage and Conversion” *Materials Science, Engineering, and Commercialization Program Forum*, Texas State University, San Marcos, TX, September 9, 2016 (oral).
- 31) **Rhodes, C.P.*** Perspectives on Research and Commercialization” *Materials Science, Engineering, and Commercialization Program Graduate Student Seminar*, Texas State University, San Marcos, TX, September 9, 2016 (oral).
- 32) **Rhodes, C.P.*** The effect of structure and orientation on electrochemical charge storage and charge transport of two-dimensional transition metal compounds”, *ASME International Mechanical Engineering Congress and Exposition (Multiphysics Coupling in Energy Storage Minisymposium*, Abstract No. IMECE2015-53879), Houston, Texas, November 13-19, 2015 (oral).
- 33) **Rhodes, C.P.*** Advanced Electrochemical Nanomaterials: Interplay of Structure and Properties in Transition Metal Compounds” *Invited Seminar to Southwest Research Institute*, San Antonio, TX, July 28, 2015 (oral).
- 34) **Rhodes, C.P.***; Ly, C.‡; Saint-Vincent, C.; McFeron, R.‡; Ricard, B.‡ “Enhancing electrochemical charge storage and transport in two-dimensional vanadium pentoxide”, *Invited Seminar to the Naval Research Laboratory, Surface Chemistry Branch*, Washington, D.C., July 21, 2015 (oral).
- 35) **Rhodes, C.P.*** Advanced Electrochemical Nanomaterials: Interplay of Structure and Properties in Transition Metal Compounds, *Materials Science, Engineering, and Commercialization Program Forum*, Texas State University, San Marcos, TX, October 24, 2014 (oral).
- 36) **Rhodes, C.P.*** How to Be Successful in Industry: Personal Perspectives, *Materials Science, Engineering, and Commercialization Program Graduate Student Seminar*, Texas State University, San Marcos, TX, October 24, 2014 (oral).

Invited talks prior to becoming a faculty member at Texas State University

- 37) **Rhodes, C.P.*** Designing Advanced Electrochemical Nanomaterials: Interplay of Structure and Properties in Transition Metal Compounds, *Departmental Seminar, Department of Mechanical Engineering*, Texas A&M University, College Station, TX, February 5, 2014 (oral).
- 38) **Rhodes, C.P.***; Lopez, R.; Mullings, M.; Li, X.; Stuart, J.; Lau, J.; Licht, S. Using Multi-electron Charge Storage Materials to Extend Battery Energy Densities: Vanadium Boride/Air Batteries, *Thermec 2013, 8th International Conference on Processing and Manufacturing of Advanced Materials* (Session: Fuel Cells, Hydrogen Storage Technologies, Batteries, Supercapacitors & Thermoelectric Materials), Las Vegas, NV, December 2-6, 2013 (oral).
- 39) **Rhodes, C.P.*** Chemistry of Advanced Materials for Electrochemical Energy Storage and Conversion, *Presentation to the Texas A&M Student Chapter of the American Chemical Society*, College Station, TX, February 23, 2010 (oral).
- 40) **Rhodes, C.P.***; Fu, Y.; Mullings, M. Electrochemistry in Motion: Advanced Electrochemical Energy Storage/Conversion Materials and Devices, *Invited Presentation to University of Texas Student Chapter of the Electrochemical Society*, Austin, TX, December 8, 2009 (oral).

C.2. Contributed Presentations

(† represents graduate students, ‡ represents undergraduate students, § represents postdocs, * represents corresponding author, underline represents presenting author)

Contributed presentations as an Associate Professor at Texas State University (Sept. 2019-pres)

- 1) Kimmel, S.W.†; DeBlock, R.H.; Manley, J.A.†; Gibson, B.M.‡; Silguero, C.M.‡; Rolison, D.R.*; **Rhodes, C.P.*** Designing Architected Nickel Hydroxide Cathodes for Rechargeable Alkaline

- Nickel–Zinc Batteries, *24th Electrochemical Society Meeting*, Gothenburg, Sweden, October 8-12, 2023 (oral).
- 2) DeBlock, R.H.; Neale, Z.G.; Kimmel, S.W.[†]; **Rhodes, C.P.**; Long, J.W.; Rolison, D.R.* Architectural Redesign of Both Electrodes Improves Alkaline Battery Performance, *266th Meeting of the American Chemical Society* (Symposium on Aqueous-Based Energy Storage: From Fundamentals to Applications), San Francisco, CA, August 13-17, 2023 (oral).
 - 3) Meehan, C.[‡]; Albiter, L.A.[†]; **Rhodes, C.P.*** Effect of High Energy Ball Milling on the Structure of Ruthenium-Zirconium Oxides. *2023 Research, Inquiry and Creative Expression (R.I.C.E.) Showcase*, San Marcos, TX, August 2, 2023 (poster).
 - 4) Manley, J.A.[‡]; Silguero, C.M.[‡]; Kimmel, S.W.[†]; **Rhodes, C.P.*** Synthesis and Characterization of Nickel Hydroxide Cathodes for Rechargeable Alkaline Nickel-Zinc Batteries. *University of Texas at Austin Partnerships for Research and Education in Materials (PREM) Day*, Austin, TX, July 13, 2023 (poster).
 - 5) Urena, M.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Effect of Oxygen Evolution Catalyst Layer Composition on Proton-Exchange Membrane Water Electrolyzer Performance and Durability. *University of Texas at Austin Partnerships for Research and Education in Materials (PREM) Day*, Austin, TX, July 13, 2023 (poster).
 - 6) Kimmel, S.W.[†]; DeBlock, R.H.; Manley, J.A.[†]; Gibson, B.M.[‡]; Silguero, C.M.[‡]; Rolison, D.R.*; **Rhodes, C.P.*** Designing High Discharge Capacity and High-Rate Nickel Hydroxide Cathodes for Rechargeable Alkaline Nickel–Zinc Batteries, *49th Power Sources Conference*, Fort Washington, MD, June 27–30, 2023 (oral).
 - 7) **Rhodes, C.P.***; Godínez-Salomón, J.F.[§]; Urena, M.[†] Effects of Catalyst Composition, Loading, and Spray Parameters on the Performance of Unitized Regenerative Fuel Cell Membrane Electrode Assemblies, Effects of Bifunctional Oxygen Catalyst Layer Composition on Unitized Regenerative Fuel Cell Performance, *243rd Electrochemical Society Meeting (Session I01: Low Temperature Water Electrolysis for H₂ Production)*, Boston, MA, May 28-June 2, 2023 (oral).
 - 8) Albiter, L.A.^{†*}; Bailey, K.O.[‡]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Effect of Metal-Substitution within Ruthenium Oxide on Structure and Oxygen Evolution Activity and Stability, *243rd Electrochemical Society Meeting (Symposium I03: Fuel Cells, Electrolyzers, and Energy Conversion - Materials for Low Temperature Electrochemical Systems)*, Boston, MA, May 28-June 2, 2023 (oral).
 - 9) Urena, M.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Effect of Oxygen Evolution Catalyst Layer Composition on Proton-Exchange Membrane Water Electrolyzer Performance and Durability. *Texas State Center for Intelligent Materials Assembly (CIMA) Partnerships for Research and Education in Materials (PREM) Site Visit and Annual Meeting*, San Marcos, TX, April 24, 2023 (poster).
 - 10) Bailey, K.O.[‡]; Albiter, L.A.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Structural Analysis of Ruthenium-Titanium Oxide Oxygen Evolution Electrocatalysts using X-ray Photoelectron Spectroscopy. *2023 Materials Research Society Spring Meeting & Exhibit* (Symposium CH01: Advanced Characterization Techniques for Electrochemistry—Accelerating Research and Development of Energy Materials), San Francisco, California, April 10-14, 2023 (poster).
 - 11) Urena, M.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Effect of Oxygen Evolution Catalyst Layer Composition on Proton-Exchange Membrane Water Electrolyzer Performance and Durability. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).
 - 12) Naymik, Z.^{*†}; Godínez-Salomón, J.F.[§]; Albiter, L.A.[†]; **Rhodes, C.P.*** Improving Mixed Metal Oxide Electrocatalysts for Proton Exchange Membrane Water Electrolysis by Thermal Treatment Tailoring. Synthesis and Characterization of Nickel Hydroxide Cathodes for Rechargeable Alkaline Nickel-Zinc Batteries. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).

- 13) Manley, J.A.[‡]; Silguero, C.M.[‡]; Kimmel, S.W.[†]; **Rhodes, C.P.*** Synthesis and Characterization of Nickel Hydroxide Cathodes for Rechargeable Alkaline Nickel-Zinc Batteries. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).
- 14) Adame Solorio, J.[†]; Bailey, K.O.[‡]; **Rhodes, C.P.*** Ruthenium-Chromium Oxide Aerogel Electrocatalysts: Structure, Oxygen Evolution Activity and Stability. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).
- 15) Bailey, K.O.[‡]; Albiter, L.A.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Metal Substituted Ruthenium Oxides: Surface Electronic Structure, Oxygen Evolution Activity and Stability. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).
- 16) Caffey, C.A.[‡]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Mechanochemical Synthesis and Characterization of Ruthenium-Titanium Oxides as Oxygen Evolution Electrocatalysts for Water Splitting. *2023 Texas Partnerships for Research and Education in Materials (PREM) Conference*, San Marcos, TX, March 31, 2023 (poster).
- 17) Naymik, Z.^{†*}; Godínez-Salomón, J.F.[§]; Albiter, L.A.[†]; **Rhodes, C.P.*** Effects of thermal treatment temperature and atmosphere on ruthenium-titanium oxide oxygen evolution reaction electrocatalysts. *American Chemical Society (ACS) Spring 2023 Meeting* (Session: Applied Electrochemistry for Advanced Fuel Cell and Electrolyzer Technologies), Indianapolis, IN, March 26-30, 2023 (poster).
- 18) Urena, M.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Ultrasonically Sprayed RuO₂-based Catalyst Layers for High Performance and Improved Durability Water Electrolyzers, *Center for Dynamics and Control of Materials, Materials Research Science and Engineering Center (MRSEC) 2023 Annual Meeting and Industry Day*, University of Texas Austin, Austin, Texas, February 28, 2023 (poster).
- 19) **Rhodes, C.P.***; Godínez-Salomón, J.F.[§]; Albiter, L.A.^{†*}; Bailey, K.O.[‡]; Naymik, Z.G.[†]; Ospina-Acevedo, F. A.; Balbuena, P.B.; Effects of Titanium Substitution within Ruthenium Oxide on Structure, Oxygen Evolution Activity and Stability, *242th Electrochemical Society Meeting (Symposium I01 - Polymer Electrolyte Fuel Cells & Electrolyzers 22)*, Atlanta, GA, October 10-14, 2022 (oral).
- 20) Godínez-Salomón, J.F.[§]; Urena, M.[†]; **Rhodes, C.P.*** Effects of Catalyst Composition, Loading, and Spray Parameters on the Performance of Unitized Regenerative Fuel Cell Membrane Electrode Assemblies, *242th Electrochemical Society Meeting (Symposium I01A - Fuel Cells, Electrolyzers and Energy Conversion 19)*, Atlanta, GA, October 10-14, 2022 (oral).
- 21) Albiter, L.A.^{†*}; Bailey, K.O.[‡]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Ruthenium-Zirconium Oxides as Highly Stable Oxygen Evolution Electrocatalysts, *242th Electrochemical Society Meeting (Symposium I01D: Polymer Electrolyte Fuel Cells & Electrolyzers 22(PEFC&E 22) - Catalyst Activity/Durability for Hydrogen (-Reformate) Acidic Fuel Cells)*, Atlanta, GA, October 10-14, 2022 (oral).
- 22) Albiter, L.A.[†]; Godínez-Salomón, J.F.[§]; Bailey, K.O.[‡]; **Rhodes, C.P.*** Nanostructured Mixed-Metal Oxides and Supported Oxygen Evolution Electrocatalysts, *Texas State PREM Center for Intelligent Materials Assembly (CIMA) Annual Meeting*, Texas State University, San Marcos, TX, September 30, 2022 (oral).
- 23) Bailey, K.O.[‡]; Albiter, L.A.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Analysis of Structure of Ruthenium Titanium Oxide Oxygen Evolution Electrocatalysts using X-ray Photoelectron Spectroscopy, *Texas State PREM Center for Intelligent Materials Assembly (CIMA) Annual Meeting*, Texas State University, San Marcos, TX, September 30, 2022 (poster).
- 24) Gibson, B.[‡]; Manly, J.[‡]; Kimmel, S.W.[†]; **Rhodes, C.P.*** Effect of Microwave Reaction Conditions on the Synthesis and Structure of Al-Ni(OH)₂ Nanosheets, *Texas State PREM Center*

- for *Intelligent Materials Assembly (CIMA) Annual Meeting*, Texas State University, San Marcos, TX, September 30, 2022 (poster).
- 25) Urena, M.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.*** Effect of Ultrasonic Spray Parameters and Catalyst Composition on Water Electrolyzer Membrane Electrode Assembly Performance and Durability, *Texas State PREM Center for Intelligent Materials Assembly (CIMA) Annual Meeting*, Texas State University, San Marcos, TX, September 30, 2022 (poster).
 - 26) Suh, D.[‡]; Albiter, L.A.[†]; Kimmel, S.W.[†]; Naymik, Z.G.[†]; Urena, M.[†]; **Rhodes, C.P.** Evaluating the Structure of Metal-Doped Ruthenium Oxides using Raman Spectroscopy, *College of Science and Engineering Summer Research Symposium*, Texas State University, San Marcos, TX, August 4, 2022 (poster).
 - 27) Urena, M.[†]; Bailey, K.O.[‡]; **Rhodes, C.P.*** Metal-Substituted RuO₂ for High Activity and Improved Stability Water Electrolyzers, *High Energy X-ray Techniques (HEXT) Workshop 2022*, Cornell University, Ithaca, NY, May 17-18, 2022 (poster).
 - 28) Mough, C.[‡]; Kimmel, S.K.[†]; **Rhodes, C.P.** Variable Microwave Synthesis Methods of MnO₂ for High Energy Density Rechargeable Manganese–Zinc Batteries. *16th Annual Undergraduate Research Conference & Honors Thesis Forum*, Texas State University, San Marcos, TX, April 20-22, 2022 (poster).
 - 29) Davis, B.[‡]; Kimmel, S.K.[†]; Mough, C.[‡]; **Rhodes, C.P.** Carbon Nanofiber Paper 3D Current Collectors for Aqueous Nickel-Zinc Battery Cathodes. *16th Annual Undergraduate Research Conference & Honors Thesis Forum*, Texas State University, San Marcos, TX, April 20-22, 2022 (poster).
 - 30) Albiter, L.A.^{†*}; Bailey, K.O.[‡]; **Rhodes, C.P.** Ruthenium-Zirconium Oxides for Highly Stable Oxygen Evolution Electrocatalysts, *UT Austin Materials Research Science and Engineering Center (MRSEC): Center for Dynamics and Control of Materials Annual Meeting*, Virtual, February 3, 2022 (poster).
 - 31) Kimmel, S.K.[†]; DeBlock, R.H.; Chervin, C.N.; Long, J.W.; Parker, J.F.; Hopkins, B.J.; Rolison, D.R.; **Rhodes, C.P.*** Stabilizing Nanostructured α -Ni(OH)₂ for High Energy Density Rechargeable Nickel–Zinc Batteries, *Fall 2021 Materials Research Society Meeting and Exhibit (Symposium EN12—Advanced Materials and Chemistries for Low-Cost and Sustainable Batteries)*, Boston, MA, November 28–December 3, 2021 (oral).
 - 32) Balbuena, P.B.^{*}; Ospina-Acevedo, F. A.; Kuai, D.; Godínez-Salomón, J.F.[§]; Albiter, L.[†]; Naymik, Z.[‡]; **Rhodes, C.P.** Oxygen Evolution Reaction on Ti-doped RuO₂ Catalysts: Electronic and Reactivity Effects, *Fall 2021 Materials Research Society Meeting and Exhibit (Symposium EN14-Advanced Materials for Hydrogen and Fuel Cell Technologies)*, Boston, MA, November 28–December 3, 2021 (poster).
 - 33) Albiter, L.A.^{†*}; Bailey, K.O.[‡]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.** Ruthenium-Zirconium Oxides for Highly Stable Oxygen Evolution Electrocatalysts, *Texas State University Student Technology and Research (STAR) Showcase Symposium*, San Marcos TX (virtual), November 19, 2021 (oral).
 - 34) Godínez-Salomón, F.[§]; Urena, M.[†]; **Rhodes, C.P.***; “Effects of Catalyst Layer and Porous Transport Layer Properties on Performance of Unitized Regenerative Fuel Cells”, *240th Electrochemical Society Meeting (Symposium I01B - Polymer Electrolyte Fuel Cells & Electrolyzers 21 (PEFC&E 21) Cells, Stacks and Systems)*, Virtual Meeting, October 10-14, 2021 (oral).
 - 35) **Rhodes, C.P.***; Godínez-Salomón, J.F.[§]; Adame Solorio, J. [†]; Albiter, L.[†]; Naymik, Z.[‡] “Bimetallic Oxygen Evolution Electrocatalysts: Relationships of Structure, Activity and Stability” *240th Electrochemical Society Meeting (Symposium I01F - Polymer Electrolyte Fuel Cells & Electrolyzers 21 (PEFC&E 21) Polymer-Electrolyte Electrolysis)*, Virtual Meeting, October 10-14, 2021 (oral).
 - 36) Kimmel, S.K.^{†*}; Hopkins, B.J.; Chervin, C.N.; Skeele, N.L.; Ko, J.S.; DeBlock, R.H.; Long, J.W.; Parker, J.F.; Hudak, B.M.; R.M. Stroud, R.M.; Rolison, D.R.; **Rhodes, C.P.** Capacity and Phase

- Stability of Metal-Substituted α -Ni(OH)₂ Nanosheets in Aqueous Ni–Zn Batteries. *Texas State University Student Technology and Research Showcase Symposium*, San Marcos TX, May 5, 2021.
- 37) Bailey, K.^{‡*}; Albiter, L.[†]; Godínez-Salomón, J.F.[§]; **Rhodes, C.P.** Evaluation of Metal Substituents on Surface Structure of Ruthenium Oxides using Photoelectron Spectroscopy. *CheMIE REU Presentation*, Texas State University, San Marcos, TX, July 7, 2021 (oral).
 - 38) Urena, M.^{‡*}; **Rhodes, C.P.** Niobium Oxide Aerogels as a Catalyst Support for Water Splitting, *15th Annual Undergraduate Research Conference & Honors Thesis Forum*, Texas State University, San Marcos, TX, Virtual Meeting, April 21-23, 2021 (oral).
 - 39) Godínez-Salomón, F.[§]; Albiter, L.[†]; **Rhodes, C.P.**^{*}; “Active and Stable Bifunctional Oxygen Electrocatalysts and Catalyst Layers for Unitized Regenerative Fuel Cells” *PRiME 2020 (Session I01: Polymer Electrolyte Fuel Cells and Electrolyzers 20)*, Virtual, October 4-9, 2020 (oral).
 - 40) Albiter, L.^{*†}; Godínez-Salomón, F.[§]; **Rhodes, C.P.**; “High Surface Area, Conductive Niobium Oxides for Highly Durable Oxygen Evolution Catalyst Supports for Water Electrolyzers”, *11th Annual International Research Conference*, Texas State University, San Marcos, TX, November 5-7, 2019 (poster).
 - 41) Aguirre, L.^{*†}; **Rhodes, C.P.**; “Effect of Substituents within Tantalum Oxide Aerogels for Obtaining High Stability Acidic Oxygen Reduction Electrocatalyst Supports”, *11th Annual International Research Conference*, Texas State University, San Marcos, TX, November 5-7, 2019 (poster).
 - 42) **Rhodes, C.P.**^{*}; Adame Solorio, J.[†]; Godínez-Salomón, F.[§]; “Effects of Catalyst and Electrode Composition on Performance of Unitized Regenerative Fuel Cells”, *236th Electrochemical Society Meeting (Symposium I01: Polymer Electrolyte Fuel Cells and Electrolyzers 19-Section F)*, Atlanta, Georgia, October 13-17, 2019 (oral).
 - 43) Adame Solorio, J.[†]; Godínez-Salomón, F.[§]; **Rhodes, C.P.**^{*}; “Ruthenium-Metal Nanostructures for High Activity and Stability Acidic Oxygen Evolution Electrocatalysts”, *236th Electrochemical Society Meeting (Symposium I01: Polymer Electrolyte Fuel Cells and Electrolyzers 19 (Section F))*, Atlanta, Georgia, October 13-17, 2019 (poster).
- Contributed presentations as an Assistant Professor at Texas State University (Sept. 2014-Sept. 2019)*
- 44) Pollok, K.^{*}; Aguirre, L.[†]; Albiter, L.[†]; **Rhodes, C.P.**; “Substituted Titanium Oxides for Non-Carbon Catalyst Supports: Effects of Composition and Thermal Treatments”, *CheMIE REU Mid-summer Presentation*, Texas State University, San Marcos, TX, July 12, 2019 (oral).
 - 45) Godínez-Salomón, F.[§]; Albiter, L.[†]; **Rhodes, C.P.**^{*}; “Two-dimensional Nanoframes for High Activity Bifunctional Acidic Oxygen Reduction and Evolution Electrocatalysts” *235th Electrochemical Society Meeting (Symposium I01 - Oxygen or Hydrogen Evolution Catalysts for Water Electrolysis 5, Abstract No. #I01-1463)*, Dallas, TX, May 26-31, 2019 (oral).
 - 46) Aguirre, L.[†]; **Rhodes, C.P.**^{*}; “Nanostructured Carbon-Free Tantalum Oxide-Supported Platinum for Highly Active and Stable Acidic Oxygen Reduction Electrocatalysts”, *235th Electrochemical Society Meeting (Symposium Z01 – General Student Poster Session, Abstract No. #Z01-2208)*, Dallas, TX, May 26-31, 2019 (poster).
 - 47) Kimmel, S.[†]; Ko, J.S.; Long, J.W.; Parker, J.F.; Rolison, D.R.; **Rhodes, C.P.**^{*}; “Nanostructured Nickel Hydroxide Cathodes for Energy Dense, Safe, Aqueous Rechargeable Nickel–Zinc Batteries” *235th Electrochemical Society Meeting (Symposium Z01 – General Student Poster Session, Abstract No. #Z01-2147)*, Dallas, TX, May 26-31, 2019 (poster).
 - 48) Niu, S.[†]; **Rhodes, C.P.**^{*}; “Investigation of the Effects of Crystallinity of Iron Oxyhydroxides on Na-ion Charge Storage” *235th Electrochemical Society Meeting (Symposium A02 - Lithium Ion Batteries and Beyond, Abstract No. #A02-0203)*, Dallas, TX, May 26-31, 2019 (poster).
 - 49) **Rhodes, C.P.**^{*}; Godínez-Salomón, F.[§]; Ying, Y.[†]; Mendoza-Cruz, R.; Arellano-Jimenez, J. “Bimetallic Two-dimensional Nanoframes for High Activity Oxygen Evolution Electrocatalysts” *54th Texas Society for Microscopy Meeting*, San Antonio, Texas, February 21-23, 2019 (poster).

- 50) **Rhodes, C.P.***; Godínez-Salomón, F.§; Albiter, L.‡; Ying, Y.†; “Hydrous Iridium-Metal Oxide Nanoarchitectures for High Activity Oxygen Evolution Electrocatalysts” *Americas International Meeting on Electrochemistry and Solid-State Science (AiMES) 2018* (Symposium I01 – Polymer Electrolyte Fuel Cells and Electrolyzers 18, Section F, Abstract No. #I01F-1624), Cancun, Mexico, September 30 - October 4, 2018 (oral).
- 51) **Rhodes, C.P.***; Godínez-Salomón, F.§; Ying, Y.†; “Self-Supported, Carbon-free Bimetallic Two-Dimensional Nanoframes for High Activity and Stability Oxygen Reduction Electrocatalysts for Fuel Cells” *Americas International Meeting on Electrochemistry and Solid-State Science (AiMES) 2018* (Symposium I01 – Polymer Electrolyte Fuel Cells and Electrolyzers 18, Section D, Abstract No. #I01D-1504), Cancun, Mexico, September 30-October 4, 2018 (oral).
- 52) **Meyer, R.***; Ying, Y.; Damin, C.; Godínez-Salomón, F.§; **Rhodes, C.P.**; “Vibrational Spectroscopic Investigation of Synthesis and Structure of Cobalt-Iridium Oxide Oxygen Evolution Electrocatalysts”, *2018 STEM Undergraduate Research Symposium*, San Marcos, TX, August 3, 2018 (poster).
- 53) **Balbuena, P. B.***, Camacho-Forero, L.E.; Godínez-Salomón, F.§; **Rhodes, C.P.**; “Analysis of the Oxygen Evolution Reaction on M-IrO₂ (M=Ni, Co) Surfaces”, *233rd Electrochemical Society Meeting* (Symposium L02 – Electrocatalysis 9: Abstract No. #110488), Seattle, WA, May 13-17, 2018. ECS Abstract #110488 - 233rd ECS Meeting, May 13-17, 2018 (oral).
- 54) **Kimmel, S.***; Godínez-Salomón, F.§; Geerts, I.W.; **Rhodes, C.P.**; “Investigating the Effects of Iron Substitution on the Structure and Magnetization of α -Nickel Hydroxide and Nickel Oxide Nanosheets” *Texas State University 12th Annual Undergraduate Research Conference*, San Marcos, TX, April 20, 2018 (poster).
- 55) **Archer, R.†**; Godínez-Salomón, F.§; **Rhodes, C.P.*** “Titanium Nitride-Supported Iridium Oxygen Evolution Electrocatalysts for Water Splitting”, *Department of Chemistry & Biochemistry Research Colloquium*, San Marcos, TX, April 6, 2018 (oral).
- 56) Godínez-Salomón, F.§; Albiter, L.; Alia, S.; Pivovar, B.; Balbuena, P.; Camacho-Forero, L.; **Rhodes, C.P.** “High Performance Nickel-Iridium 2D Nanoframe Electrocatalysts for Water Splitting” *2018 CEC Annual Workshop on Electrochemistry*, Austin, TX, February 10-11, 2018 (poster).
- 57) **Míreles Villegas, N.‡**, Godínez-Salomón, F.§, **Rhodes, C.P.**; “Investigation of the Effects of Iridium Substitution within Nickel Hydroxide Nanosheets, *University College STEM Undergraduate Research Experience (SURE) Poster Presentation*, San Marcos, Texas, November 17, 2017 (poster).
- 58) **Rhodes, C.P.***; Godínez-Salomón, F.§, Albiter, L.‡ “Two-dimensional Iridium-Nickel-Oxide Nanoframes for High Activity Oxygen Evolution Electrocatalysts”, *232nd Electrochemical Society Meeting* (Symposium I01 – Polymer Electrolyte Fuel Cells 17, Section F, Abstract No. # I01F-1654), National Harbor, MD, October 1-5, 2017 (oral).
- 59) **Ying, Y.†**; Godínez-Salomón, F.§; Archer, R.†; **Rhodes, C.P.***; “Unsupported Platinum-metal Two-dimensional Nanoframe Oxygen Reduction Electrocatalysts: Effect of Transition Metal Composition on Activity and Stability” *232nd Electrochemical Society Meeting* (Symposium I01 – Polymer Electrolyte Fuel Cells 17, Section D, Abstract No. # I01D-1539), National Harbor, MD, October 1-5, 2017 (poster).
- 60) **Archer, R.†**; Godínez-Salomón, F.§; **Rhodes, C.P.***; “Titanium Oxide Nanosheets for Proton-Exchange Membrane Oxygen Evolution Electrocatalysts”, *232nd Electrochemical Society Meeting* (Symposium I01 – Polymer Electrolyte Fuel Cells 17, Section F, Abstract No. # I01F-1647), National Harbor, MD, October 1-5, 2017 (poster).
- 61) **Rhodes, C.P.***; Godínez-Salomón, F.§; Archer, R.†; Ying, Y.†; “Two-dimensional Nanoframes as Bifunctional Oxygen Electrodes for Unitized Regenerative Fuel Cells” *231st Electrochemical Society Meeting* (Symposium I01: Oxygen or Hydrogen Evolution Catalysts for Water Electrolysis 3, Abstract No. I01-1425), New Orleans, LA, May 28-June 2, 2017 (oral).

- 62) Godínez-Salomón, F.^{§*}; **Rhodes, C.P.**; “Unsupported Two-dimensional Ni-Pt Nanoframes with High Activity and Stability Towards the Oxygen Reduction Reaction” *231st Electrochemical Society Meeting* (Symposium I02: Materials for Low Temperature Electrochemical Systems 3, Abstract No. I02-1438), New Orleans, LA, May 28-June 2, 2017 (oral).
- 63) **Rhodes, C.P.**^{*} Perera, S.D.; Archer, R.[†] “Enhanced Magnesium-Ion Charge Transport and Storage within Layered Vanadium Pentoxide-Poly(ethylene oxide) Nanocomposites” *231st Electrochemical Society Meeting* (Symposium A05: Lithium-ion Batteries and Beyond, Abstract No. # A05-0315), New Orleans, LA, May 28-June 2, 2017 (oral).
- 64) Niu, S.[†]; Godínez-Salomón, F.[§]; **Rhodes, C.P.**^{*}; “Iron Oxide Nanosheets as High Performance Cathodes for Lithium-ion and Sodium-ion Batteries”, *231st Electrochemical Society Meeting* (Symposium A05: Lithium-ion Batteries and Beyond, Abstract No. A05-0349), New Orleans, LA, May 28-June 2, 2017 (oral).
- 65) Niu, S.[†]; Godínez-Salomón, F.[§]; **Rhodes, C.P.**^{*}; “Iron Oxide Nanosheet Architectures for Improved Charge Storage of Lithium and Sodium Ions” *Women in Science and Engineering Conference, Texas State University, San Marcos, TX, April 28, 2017.* (poster).
- 66) Ying, Y.[†]; Godínez-Salomón, F.[§]; Archer, R.[†]; **Rhodes, C.P.**^{*} “Two-dimensional Nanoframes with Controlled Transition Metal Compositions to Enable High Activity and Stability Oxygen Reduction Electrocatalysts for Fuel Cells” *Women in Science and Engineering Conference, Texas State University, San Marcos, TX, April 28, 2017* (poster).
- 67) **Rhodes, C.P.**^{*} Perera, S.D.; Archer, R.[†]; Damin, Craig A.; Acharya, S.[‡] “Controlling interlayer interactions in vanadium pentoxide-poly(ethylene oxide) nanocomposites for enhanced magnesium-ion charge transport and storage” *2017 Materials Research Society (MRS) Spring Meeting*, (Symposium ES3: Materials for Multivalent Electrochemical Energy Storage, Paper No. ES3.4.02), Phoenix, AZ, April 17-21, 2017 (oral).
- 68) Niu, S.[†]; McFeron, R.[‡]; Chapman, B.S.; Tracy, J.B.; **Rhodes, C.P.**^{*}; “Using Nanosheets to Improve the Electrochemical Performance of Iron Oxide Cathodes for Lithium-Ion Batteries” *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference*, San Marcos, Texas, June 27-28, 2016 (oral).
- 69) Perera, S.D.[§]; Archer, R.[‡]; **Rhodes, C.P.**^{*} “Interlayer-expanded vanadium oxide-poly(ethylene oxide) nanocomposites for enhanced magnesium-ion storage” *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference*, San Marcos, Texas, June 27-28, 2016 (oral).
- 70) Ly, C.[‡]; Zaleski, A.[‡]; Ricard, B.[‡]; McFeron, R.[‡]; **Rhodes, C.P.**^{*}; “Controlling the orientation and properties of two-dimensional vanadium pentoxide using drying conditions and magnetic fields” *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference*, San Marcos, Texas, June 27-28, 2016 (poster).
- 71) Godínez-Salomón, F.[§]; Mendoza-Cruz, R.; M. José-Yacamán, M.; **Rhodes, C.P.**^{*} “Two-dimensional Nickel-Platinum Nanoframes: A New Approach for High Activity and Stability Oxygen Reduction Electrocatalysts for Fuel Cells” *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference*, San Marcos, Texas, June 27-28, 2016 (oral).
- 72) Archer, R.[‡]; Perera, S.D.[§]; **Rhodes, C.P.**^{*} “Effects of Temperature and Atmosphere Treatments on the Structure and Electrochemical Properties of V₂O₅ Nanomaterials” *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference*, San Marcos, Texas, June 27-28, 2016 (poster).
- 73) **Rhodes, C.P.**^{*}; Godínez-Salomón, F.[§] “Two-dimensional Ni(OH)₂@Pt Nanosheets: High Activity Fuel Cell Oxygen Reduction Reaction Electrocatalysts” *229st Electrochemical Society Meeting* (Session L02: Electrocatalysis 8: Physical and Analytical Electrochemistry Division, Abstract No. 48488), San Diego, CA, May 29-June 3, 2016 (oral).

- 74) Saint Vincent, C.^{‡*}; Ly, C.[‡]; Archer, R.[‡]; McFeron, R.[‡]; **Rhodes, C.P.**; The Effect of Temperature and Particle Size on the Electrochemical Properties of 2D Vanadium Pentoxide, *Spring 2016 Meeting of the Texas Section of the American Physical Society*, Beaumont, TX, March 31-April 2, 2016 (poster).
- 75) Rolison D.R.*; Harper-Leatherman, A.S.; Wallace J.M.; **Rhodes, C.P.**; Long, J.W.; “Electron transfer within microheterogeneous domains: Colloidal Au-nucleated cytochrome c superstructures” ACS Award in Colloid & Surface Chemistry: Symposium in honor of Nick Abbott-Oral, Invited, *251st ACS National Meeting & Exposition*, San Diego, CA, March 13-17, 2016 (oral).
- 76) **Rhodes, C.P.*** “The effect of structure and orientation on electrochemical charge storage and charge transport of two-dimensional transition metal compounds” *ASME International Mechanical Engineering Congress and Exposition (Multiphysics Coupling in Energy Storage Minisymposium)*, Houston, Texas, November 13-19, 2015 (oral).
- 77) Godínez-Salomón, F.[§]; Bahena, D.; McFeron, R.[‡]; Solorza-Feria, O.; **Rhodes, C.P.***; “New Advanced 2D NiAu@Pt Nanolayers with High Electrocatalytic Activity for the Oxygen Reduction Reaction” XV International Congress of the Mexican Hydrogen Society, Mexico, D.F. September 22 – 25, 2015 (oral).
- 78) Ly, C.[‡]; McFeron, R.[‡]; Zaleski, A.[‡]; Ricard, B.[‡]; **Rhodes, C.P.***; “The Effect of Orientation on the Structure and Properties of 2D Vanadium Pentoxide”, *4th Texas Soft Matter Meeting*, Houston, TX, Aug 21, 2015 (oral).
- 79) **Rhodes, C.P.***; Ly, C.[‡]; Cruz, G.[‡]; McFeron, R.[‡]; Ricard, B.[‡] “Enhancing electrochemical charge storage and transport in two-dimensional vanadium pentoxide”, *227st Electrochemical Society Meeting* (Session A1: Batteries and Energy Storage, Abstract No. 48488), Chicago, IL, May 24-28, 2015 (oral).
- 80) Stuart, J.; Lefler, M.; **Rhodes, C.P.**; Licht, S.*; “New High Energy Capacity VB₂/TiB₂ Composite Transition Metal Boride Air Battery” *227st Electrochemical Society Meeting*, Chicago, IL, May 24-28, 2015.

Contributed presentations prior to becoming a faculty member at Texas State University

- 81) **Rhodes, C.P.***; Mullings, M.; Li, X.; Mike, J. “Designed electrolytes and Electrode-Electrolyte Interfaces for High Performance Lithium-Ion Batteries”, Division of Energy and Fuels (Session: Electrolyte Systems and Interfacial Processes in Energy Storage and Conversion), *247th ACS National Meeting & Exposition*, Dallas, TX, 16-20 March 2014 (oral).
- 82) **Rhodes, C.P.***; “Advanced Non-flammable Electrolytes for Li-ion Batteries”, *Naval Opportunities Forum*, Crystal City, VA, 3–5 June 2013 (oral).
- 83) **Rhodes, C.P.***; Mullings, M.; Lopez, R. “Advanced Non-flammable Electrolytes for High Performance Li-ion Batteries”, Division of Energy and Fuels (Session: Advances in Batteries), *245th ACS National Meeting & Exposition*, New Orleans, LA, 7–11 April 2013 (oral).
- 84) **Rhodes, C.P.**; Fenimore, J.; Hennings, B.* Long Endurance Fuel Cell Energy System for Unmanned Undersea Vehicles, *2012 Fuel Cell Seminar and Energy Exposition* (Paper No. 109) Uncasville, CT, 5-8 November 2012 (oral).
- 85) Licht, S.*; Hettige, C.; Lau, J.; Stuart, J.; Lopez, R.; Mullings, M.; **Rhodes, C.P.***; “High Energy Density Vanadium Boride-Air Batteries,” *45th Power Sources Conference* (Session: Advanced Materials and Processes III, Paper No. 9.1), Las Vegas, NV, 11–14 June 2012 (oral).
- 86) **Rhodes, C.P.***; Mullings, M.; Lopez, R. Advanced Non-flammable Electrolytes for Li-ion Batteries, *221st Electrochemical Society Meeting* (Session B5: Special Topics in Battery Science and Technology, Abstract No. 539), Seattle, WA, 6–12 May 2012 (oral).

- 87) **Rhodes, C.P.*** Long Endurance Hydride-Fuel Cell-Peroxide UUV Energy Section, *Office of Naval Research Long Endurance Undersea Vehicle Propulsion Future Naval Capabilities Kick-off Meeting*, Arlington, VA, 15 February 2012 (oral).
- 88) **Rhodes, C.P.*** Advanced Non-flammable Electrolytes for Li-ion Batteries and Electrochemical Capacitors, *12th Electrochemical Power Sources R&D Symposium*, Monterey, CA, 20–23 June 2011 (oral).
- 89) **Rhodes, C.P.*** Improved Safety, Wide Temperature Range Rechargeable Batteries for Munitions and Aircraft, *Naval Opportunities Forum*, Crystal City, VA, 6–8 June 2011 (oral).
- 90) **Rhodes, C.P.***; Fu, Y.; Mullings, M.; Uselton, K.; Cross, J.; Seo, I.; Martin, S.S. “Electrochemical Performance of Solid-State Lithium Batteries Using Thio-LISICON Solid-State Electrolytes, *218th Meeting of the Electrochemical Society*, Las Vegas, NV, 10–15 October 2010 (Symposium B1: Battery/Energy Technology Joint General Session, Abstract No. 280) (oral).
- 91) **Mullings, M.**; **Rhodes, C.P.*** Advanced Electrolytes for Extreme Temperature Supercapacitors, *44th Power Sources Meeting*, Las Vegas, NV, 14–17 June 2010 (poster).
- 92) **Fu, Y.**; **Rhodes, C.P.*** Advanced Electrode Materials for High Power Density Batteries and Supercapacitors, *44th Power Sources Meeting*, Las Vegas, NV, 14–17 June 2010 (poster).
- 93) **Rhodes, C.P.***; Kesmez, M.; Fu, Y.; Salinas, C.; Heselmeyer, E.; Parkey, J.; Mullings, M.; van Boeyen, R.; Wharton, T.; Cisar, A. Advanced Hydroxide Conducting Membranes for Alkaline Fuel Cells, Symposium on Fuel Cell Chemistry and Operation, Division of Fuel Chemistry, *238th ACS National Meeting & Exposition*, Washington, DC, 16–20 August 2009 (oral).
- 94) **Rhodes, C.P.***; Cisar, A.; Lee, H.; Fu, Y.; Anderson, A.; Gonzalez-Martin, A.; Licht, S. Effect of Temperature on the Electrolysis of Water in Concentrated Alkali Hydroxide Solutions, *3rd Symposium on Hydrogen Production, Transport and Storage, 215th Meeting of the Electrochemical Society*, San Francisco, CA, 24–29 May 2009 (oral).
- 95) **Rhodes, C.P.***; Salinas, C.; Giletto, T. “Electrochemical Generation of Hydrogen Peroxide Using a Gas Diffusion Electrode and Proton Exchange Membrane Cell Configuration,” Symposium on Industrial Electrochemistry and Electrochemical Engineering, *213th Meeting of the Electrochemical Society*, Phoenix, AZ, 18–23 May 2008 (oral).
- 96) **Parkey, J.***; **Rhodes, C.P.**; Kim, J.; Uselton, K.; Gonzalez-Martin, A. “Implantable Enzymatic Biofuel Cells,” Symposium on Biological Fuel Cells, *213th Meeting of the Electrochemical Society*, Phoenix, AZ, 18–23 May 2008 (poster).
- 97) **Rhodes, C.P.**; Long, J.W.; Doescher, M.; Rolison, D.R.* “Nanoscale Solid Polymer Electrolytes from Electropolymerization: New Routes to Integrated Nanostructured Energy Storage Architectures,” Symposium on Nanostructured Materials in Alternative Energy Devices, *Spring Meeting of the Materials Research Society*, San Francisco, CA, 12–16 April 2004 (oral).
- 98) **Rhodes, C.P.**; Long, J.W.; Doescher, M.; Rolison, D.R.* “Ultrathin Polymer Electrolytes for 3-D Solid-State Nanostructured Energy Storage Architectures” Symposium on Micropower and Microbattery Systems, *Fall Meeting of the Materials Research Society*, Boston, MA, 1–5 December 2003 (oral).
- 99) **Rhodes, C.P.**; Long, J.W.; Doescher, M.; Rolison, D.R.* “Mesoporous Nanoarchitectures as Platforms for Integrated Solid State Ionic Devices,” *7th International Symposium on Aerogels*, Alexandria, VA, 3–5 November 2003 (oral).
- 100) **Rhodes, C.P.**; Long, J.W.; Doescher, M.; Rolison, D.R.* “Synthesis and Solid-State Characterization of Ultrathin Polymers for 3-D Nanostructured Battery Architectures,” Symposium on Three Dimensional Battery Architectures, *204th Meeting of the Electrochemical Society*, Orlando, FL, 13–17 October 2003 (oral).
- 101) **Rhodes, C.P.**; Long, J.W.; Rolison, D.R.* “Controlled Modification of Defects in Nanostructured V₂O₅: Spectroelectrochemical Characterization of the Effect on Lithium-ion Insertion,”

- AFOSR/ONR Electrochemistry Science & Technology Review*, Annapolis, MD, 3–5 March 2003 (poster).
- 102) **Rhodes, C.P.**; Dong, W.; Long, J.W.; Rolison, D.R.* “Defects and Vacancies in Nanostructured V₂O₅: Controlled Modification and Spectroelectrochemical Characterization,” Symposium on Solid State Ionics, *Fall Meeting of the Materials Research Society*, Boston, MA, 2–6 December 2002 (oral).
 - 103) **Rhodes, C.P.**; Dong, W.; Long, J.W.; Rolison, D.R.* “Controlling the Defects and Vacancies in Nanostructured V₂O₅: Spectroelectrochemical Characterization,” Symposium on Solid State Ionic Devices, *202nd Electrochemical Society Meeting*, Salt Lake City, UT, 20–25 October 2002 (oral)..
 - 104) **Rhodes, C.P.***; “Local Structures in Polymer Electrolytes: Implications for Ionic Transport,” *Gordon Research Conference on Electrochemistry*, Ventura CA, 20–25 January 2002 (poster).
 - 105) **Rhodes, C.P.**; Boesch, S.; Wheeler, R.A.; Frech, R.* “Changes in the Vibrational Modes of Monoglyme Induced by Coordination to Lithium and Sodium,” *199th Meeting of the Electrochemical Society*, Washington, DC, 25–30 March 2001 (oral).
 - 106) **Rhodes, C.P.**; Frech, R.* “Local Structures in the Ionically-Conducting Phase of Poly(ethylene oxide)-Lithium Triflate,” *198th Meeting of the Electrochemical Society*, Phoenix, AZ, 22–26 October 2000 (oral).
 - 107) **Rhodes, C.P.**; Petrowsky, M.; Frech, R.* “Structural Characterization of Systems of 2-Methoxyethyl Ether with Lithium Triflate and with Sodium Triflate,” *45th Annual Pentasectional Meeting, Oklahoma Sections of the American Chemical Society*, Stillwater, OK, April 2000 (oral).
 - 108) **Rhodes, C.P.**; Burba, C.; Frech, R.* “Novel Cathode Materials for Sodium-based Rechargeable Batteries,” *43rd Annual Pentasectional Meeting, Oklahoma Sections of the American Chemical Society*, Ponca City, OK, August 1998 (oral).
 - 109) **Rhodes, C.P.**; Frech, R.* “Ionic Association in the Sodium Triflate-Poly(ethylene oxide) System,” *53rd Southwest Regional Meeting of the American Chemical Society*, Tulsa, OK, October 1997 (oral).

D. Patents, Patent Applications and Invention Disclosures

Issued Patents

- 1) **Rhodes, C.P.**; Godinez-Salomon, F. U.S. Patent, 10,682,638, Catalyst Nanoarchitectures with High Activity and Stability, Issued June 16, 2020.
- 2) **Rhodes, C.P.**; Tennakoon, C.L.K.; Singh, W.P.; Anderson, K.C. U.S. Patent 7,892,408 Cathodic Electrocatalyst Layer for Electrochemical Generation of Hydrogen Peroxide, Issued February 22, 2011.

Provisional Patent Applications

- 1) **Rhodes, C.P.**; Kimmel, S.K.†; Rolison, D.R.; DeBlock, R.H. Architected, 3D-Wired Nickel Cathode, U.S. Provisional Patent Application, **63/468,392**, Filing Date: May 23, 2023.
- 2) **Rhodes, C.P.**; Mullings, M. Electrolytes with Reduced Flammability and Wide Operating Temperature Ranges, Patent Application No. US20160020489A1, Filing Date: May 8, 2014.

Invention Disclosures

- 1) **Rhodes, C.P.**; Kimmel, S.K.†; Rolison, D.R.; DeBlock, R.H. Architected, 3D-Wired Nickel Cathode, Invention Disclosure #I2022-002, Texas State University, May 13, 2022.

E. Funding

Funding since becoming a faculty member at Texas State University

\$2.55 M in research funding; \$1.60 M in equipment funding (Total funding: \$4.15 M)

Research funding

Research funding as an Associate Professor at Texas State University (Sept. 2019-present)

- 1) Clean Energy Catalyst Run to R1 Postdoc, Role: *Principal Investigator* (B. Martin (co-PI), N. Theodoropoulou (co-PI), Y. Miyahara (co-PI)), Texas State University, Award Duration: 9/1/2023-8/31/2025, Total funding: \$128,000 (direct).
- 2) Unitized Regenerative Fuel Cells for Undersea Refuelable Unmanned Undersea Vehicles, Role: *Principal Investigator*, Office of Naval Research, Award Number: N00014-22-1-2144, Award Duration: 4/1/2022- 3/31/2025, Total funding: \$449,988.
- 3) A Chemistry REU on Molecular Innovation and Exploration (CheMIE), Role: *Senior Personnel* (K.A. Lewis (PI); Senior Personnel: C. Holland, C. Luxford, W. Webre, B. Vinciguerra, T. Betancourt, B. Brittain, T. Hudnall, J. Irvin, S. Kerwin, A. Kornienko, R. Peterson), National Science Foundation, Duration of Grant: 04/15/22 – 3/31/25, Total Award Amount: \$378,188 (Rhodes' share: \$29,347).
- 4) TxState-UT PREM Center for Intelligent Materials Assembly (CIMA), Role: *Key Personnel* (T. Betancourt (PI), E.T. Yu (co-PI), N. Theodoropoulou (co-PI); J. Irvin (co-PI), W. J. Brittain (co-PI)), National Science Foundation, Award Number: DMR-2122041, Duration of Grant: 7/12/2021- 6/30/2027, Total Award Amount: \$3,822,000 (Rhodes share: estimated \$232,612).
- 5) Three Dimensional Nickel Hydroxide Cathodes for Energy Dense, Safe Nickel-Zinc Batteries, Role: *Principal Investigator*, Office of Naval Research, Award Number: N00014-21-1-2072, Award Duration: 02/16/2021-02/15/2024, Total funding: \$225,000.
- 6) Collaborative Research: Bimetallic Oxyhydroxide Surfaces for Highly Active and Stable Acidic Oxygen Evolution Electrocatalysts, Role: *Principal Investigator* (Co-PI, P. Balbuena, Texas A&M University), National Science Foundation, Award Number: 1936458, Award Duration: 4/1/2020-3/31/2024, Total Award Amount: \$558,972 (Texas State: \$347,504; Texas A&M University: \$211,468).
- 7) Nanoarchitected Nickel Hydroxide Cathodes for Energy Dense, Safe, Rechargeable Nickel–Zinc Batteries, Role: *Principal Investigator*, Office of Naval Research, Award Number: N00014-19-1-2526, Award Duration: 8/1/2019-7/31/2021, Total funding: \$149,999.
- 8) SurgePower Materials, Inc., Fee for Service Agreement, Role: *Principal Investigator*, Award Duration: 3/1/2020-4/30/2020, Total funding: \$4,482 (\$3,200 direct).

Research funding as an Assistant Professor at Texas State University (Sept. 2014-Sept. 2019)

- 9) Bifunctional Membrane Electrode Assemblies for Unitized Regenerative Fuel Cells, Role: *Principal Investigator*, Office of Naval Research, Award Number: N00014-19-1-2071, Award Duration: 3/1/2019-2/28/2022, Total funding: \$449,980.
- 10) Nanoframe Bifunctional Oxygen Electrodes for Unitized Regenerative Fuel Cells, Role: *Principal Investigator*, Office of Naval Research, Award Number: N00014-16-1-2777, Award Duration: 7/1/2016-6/30/2019, Total funding: \$447,894.
- 11) Two-Dimensional Materials for Reversible Multi-electron Charge Storage, Role: *Principal Investigator*, Texas State University Research Enhancement Program (REP), Award Duration: Jan. 1, 2015-Mar. 31, 2016, Total funding: \$8,000.
- 12) Center on Interfaces with Materials. A Partnership with the Research Triangle MRSEC, Role: *Key Personnel* (1 of 9 investigators), National Science Foundation, Award Number: DMR-1205670, Total Award Amount: \$3,140,000 (Rhodes share: \$85,611).

- 13) REU Site: A Chemistry REU on Molecular Innovation and Entrepreneurship (CheMIE), Role: *Key Personnel*, National Science Foundation, Award Duration: 04/01/18 – 8/30/21, Award Number: 1757843, Total funding: \$314,876 (Rhodes' share: \$28,625).

Equipment funding

Equipment funding as an Associate Professor at Texas State University (Sept. 2019-present)

- 1) Inductively Coupled Plasma-Mass Spectrometry Shared Research and Education Instrument, Role: *Principal Investigator* (co-PIs: B. Martin, D. Schilter, S. Kerwin, A. Kornienko, R. Peterson, B. Schwartz, J. Dutton, K. Ikehata, S. Hwang, T. Ozbakkaloglu), Funding Source: Materials Application Research Center (MARC), Texas State University, Date of Award: September 20, 2022, Award Amount: \$259,195.
- 2) MRI: Development of Full Vector Vibrating Sample Magnetometry for Materials Research and Education, Role: *Senior Collaborator* (Wilhelmus Geerts (PI); Senior Collaborators: Yihong (Maggie) Chen, Jitendra Tate, Funding Agency: National Science Foundation, Award Number: 2216440, Duration of Grant :9/01/2022 - 08/31/2024, Award Amount: \$121,364.
- 3) Equipment for Unitized Regenerative Fuel Cells Research and Education, Role: *Principal Investigator*, Army Research Office, Award Number: W911NF-19-1-0510, Duration of Grant: 9/13/2019-1/12/2021, Total Funds Received: \$234,020.

Equipment funding as an Assistant Professor at Texas State University (Sept. 2014-Sept. 2019)

- 4) MRI: Acquisition of Vibrating Sample Magnetometer for Materials Research and Education, Role: *Co-Principal Investigator*, National Science Foundation, Equipment Grant, Duration: 9/15/2017-8/31/2019, Award Number: DMR-1726970, PI: Wim Geerts; Co-PIs: Ravi Droopad, Yihong “Maggie” Chen, Christopher Rhodes, Nikoleta Theodoropoulou, Total Funds Received: \$225,330.
- 5) MRI: Acquisition of Atomic Force Microscope to Advance Texas State University Materials Research, Role: *Co-Principal Investigator*, National Science Foundation, Equipment Grant, Duration: 9/1/2016-8/31/2019, Award Number: DMR-1625778, PI: William Brittain; Co-PIs: Gary Beall, Christopher Rhodes, Tania Betancourt, Alex Zakhidov, Total Funds Received: \$104,476.
- 6) Motorized Film Applicator for Fabrication of Polymer and Polymer Nanocomposite Films, Role: *Principal Investigator*, Society of Plastics Engineers (SPE), Equipment Grant, Date: November 9, 2017, Total Funds Received: \$2,875.
- 7) Orientation in Polymers and Polymer Nanocomposites: Equipment for Spectroscopic Evaluation, Role: *Principal Investigator*, Society of Plastics Engineers (SPE), Equipment Grant, Date: October 19, 2016, Total Funds Received: \$5,750.
- 8) Attenuated Total Reflection (ATR) accessory for characterization of polymers and polymer nanocomposites, Role: *Principal Investigator*, Society of Plastics Engineers (SPE), Equipment Grant, Date: November 3, 2015, Total Funds Received: \$10,000.

2. Teaching Activities

A. Courses Taught

- 1) CHEM 3245: Physical Chemistry Laboratory (undergraduate junior-level lecture/laboratory)
Semesters taught: Sp14, Sp15, Sp16, Sp17, Sp18, Sp19, Sp20, Sp21, Sp22, Sp23 (10 semesters)
- 2) CHEM 1335: Engineering Chemistry (undergraduate, freshman-level general chemistry course)
Fa15, Fa17 (2 semesters)
- 3) CHEM 5330: Physical Chemistry (graduate course)
Semester taught: Fa16 (1 semester)
- 4) MSEC 7325: Principles of Technical Project Management (graduate course)
Semesters taught: Fa17, Fa19 (2 semesters)

Student teaching evaluations

- Since becoming a faculty member at Texas State University, fall 2014: 4.67/5.00
- Since becoming an associate professor, fall 2019: 4.72/5.00 (dept average 4.35/5.00)

Peer teaching evaluations (from other faculty members)

- Since becoming a faculty member at Texas State University, fall 2014: 4.7/5.0
- Since becoming an associate professor, fall 2019: 4.9/5.0

B. Curriculum Development

- 1) CHEM 3245: Physical Chemistry Laboratory. Developed new curriculum and laboratories involving spectroscopy and quantum mechanics for undergraduate upper-level laboratory course; incorporated quantum mechanical molecular modelling of conjugated dyes that utilized Gaussian to allow comparison of computations with experiments.
- 2) CHEM 4299: Undergraduate Research. Developed module on crystal structures and x-ray diffraction for undergraduates that includes theory, interactive visualizations, questions, and self-paced activities to enhance student learning.
- 3) CHEM 1335: Engineering Chemistry. Developed curriculum for new freshman-level general chemistry course for engineers that included modules on intermolecular forces and thermodynamics.
- 4) CHEM 5330: Physical Chemistry. Developed new curriculum on spectroscopy and quantum mechanics for graduate (M.S.-level) Physical Chemistry course.
- 5) MSEC 7325: Principles of Technical Project Management. Proposed new course and developed course curriculum on scope management, time management, cost management, risk management and leadership. Designed course module and content that allowed students to be eligible to become a Certified Associate in Project Management (CAPM) from the Project Management Institute (PMI).
- 6) MSEC 7395C: Materials for Sustainable Energy. Co-proposed and developed a course description and outline for a new graduate (Ph.D.-level) course.

C. Research Advisor/Chair for Student Dissertations/Theses

Ph.D. Student Dissertations (graduated)

- 1) Jesus Salvador Adame Solorio (Ph.D. Materials Science, Engineering, and Commercialization; research advisor; graduation date: December 2022); Dissertation Title: "Ruthenium-Chromium Oxide Aerogels Oxygen Evolution Electrocatalysts: Structure, Activity and Stability"
- 2) Yuanfang Ying (Ph.D. Materials Science, Engineering, and Commercialization; graduation date: August 2020); Dissertation Title: "Hydrous Cobalt-Iridium Oxide Two-dimensional Nanoframes as High Activity and Stability Oxygen Evolution Catalysts"
- 3) Sibio Niu (Ph.D. Materials Science, Engineering, and Commercialization; research advisor, graduation date: Dec. 2019); Dissertation Title: "Investigation of Iron Hydroxide and Oxide-Based Nanomaterials as Cathodes for Sodium-Ion Batteries"

M.S. Student Theses (graduated)

- 1) Michael Urena (M.S. Chemistry, research advisor; graduation date: December 2023); Thesis Title: “Evaluation of Catalyst Layer Composition on Proton-Exchange Membrane Water Electrolyzer Performance and Durability”.
- 2) Zachary Naymik (M.S. Chemistry, graduation date: August 2023); Thesis Title: “Effect of Thermal Treatment Conditions on the Structure, Activity, and Stability of Ruthenium-Titanium Oxide Oxygen Evolution Electrocatalysts”
- 3) Samuel Kimmel (M.S. Chemistry; graduation date: August 2020); Thesis Title: “Metal Substitution within Nanostructured Nickel Hydroxides for Aqueous Rechargeable Nickel–Zinc Batteries”
- 4) Luis Albiter (M.S. Chemistry, graduation date: Aug. 2020); Thesis title: “Effect of Thermal Treatment on Structure and Properties of Niobium Oxide Aerogels as Electrolyzer Catalyst Supports”
- 5) Lupita Aguirre (M.S. Chemistry, graduation date: Aug. 2020); Thesis title: “Effects of Magnesium Reduction on the Structure and Electrical Properties of Tantalum Oxide Aerogels”
- 6) Randall Archer (M.S. Chemistry; research advisor, graduation date: Aug. 2018); Thesis Title: “Nanostructured Titanium Oxynitride-Supported Iridium Oxide Oxygen Evolution Electrocatalysts for Water Splitting”
- 7) Yuanfang Ying (M.S. Chemistry; research advisor, graduation date: Aug. 2017); Thesis Title: “Two-Dimensional Cobalt-Platinum Nanoframes: Synthesis, Structure, and Electrochemical Oxygen Reduction Activity”
- 8) Sibio Niu (M.S. Chemistry; research advisor, graduation date: Dec. 2016); Thesis Title: “Maghemite Nanosheets as High Performance Cathodes for Lithium-Ion Batteries”

D. Committee Member for Student Dissertations/Theses (graduated)

- 1) Xinye Liu (Ph.D. Chemistry, George Washington University; S. Licht, research advisor, graduated 2021) – External Committee Member
- 2) Adeniji Adetayo (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2021).
- 3) James Egbu (M.S. Chemistry; B. Martin, research advisor, graduated 2019).
- 4) Michael Opoku (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2019)
- 5) Isaac Blythe (M.S. Chemistry; T. Hudnall, research advisor, graduated 2018)
- 6) Edith De Leon Quiroz (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2017)
- 7) Maedeh Dabbaghianamiri (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2017)
- 8) Abbas Fahami (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2017)
- 9) Mark Riggs (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated 2017)
- 10) Brandon Henderson (Ph.D. Materials Science, Engineering, and Commercialization; G. Beall advisor; graduated July 2015)

E. Student Mentoring

- *Current students:* Research advisor for 2 postdoctoral associates, 3 Ph.D. students, 2 M.S. students, and 3 undergraduate research students
- *Graduated students:* Research advisor for 1 post-doctoral associate, 3 Ph.D. students, 8 M.S. students, and 24 undergraduate research students

Ph.D. Student Mentoring

Ph.D. Student Mentoring - Current Students

- 1) Luis Albitar (2020-present)
- 2) Samuel Kimmel (2020-present)
- 3) Zachary Naymik (2023-present)

Ph.D. Student Mentored - Former Students

- 1) Jesus Salvador Adame Solorio (2017- 2022); Now: Postdoctoral Associate, Texas State University
- 2) Yuanfang Ying (2017- 2020); Now: Stay-at-home mom “savoring precious moments” with her son, Austin
- 3) Sibio Niu (2017-2019), Now: Scientist, EnergyX (Austin, TX)

M.S. Student Mentoring

Masters Student Mentoring - Current Students

- 1) Jaret Manley (M.S. Chemistry, research advisor, 2023-present)
- 2) Keegan Bailey (M.S. Chemistry, research advisor, 2021-present)

Masters Students Mentored – Former Students

- 1) Michael Urena (2021-2023), Completed M.S. Chemistry, 2023; Now: Electrochemical Materials Technologist, Sandia National Laboratories
- 2) Zachary Naymik (2021-2023), Completed M.S. Chemistry, 2023; Now: Ph.D. Student, Texas State University
- 3) Luis Albitar (2018-2020), Completed M.S. Chemistry, 2020; Now: Ph.D. Student, Texas State University
- 4) Samuel Kimmel (2018-2020), Completed M.S. Chemistry, 2020; Now: Ph.D. Student, Texas State University
- 5) Lupita Aguirre (2018-2020); Completed M.S. Chemistry, 2020; Now: Ph.D. Student in Chemistry, Texas A&M University
- 6) Randall Archer (2016-2018); Completed M.S. Chemistry, 2018; Now: Analytical Chemist, Chemicals, Inc.
- 7) Peyton Cox (2017-2018); Now: Research Technician, Boral Material Technologies
- 4) Yuanfang Ying (2016- 2017); Graduated M.S. Chemistry, 2017); Stay-at-home mom “savoring precious moments” with her son, Austin
- 8) Sibio Niu (2015- 2016); Graduated M.S. Chemistry, 2016; Now: Scientist, EnergyX (Austin, TX)

Undergraduate Student Mentoring

Undergraduate Student Mentoring - Current Students

- 1) Dashiell Smith (2023-present)
- 2) Abriana Garza (2022-present)
- 3) Dylan Smith (2023-present)

Undergraduate Students Mentored – Former Students

- 1) Kathleen Bailey (2021-2023); Completed B.S. Chemistry 2023; Now: Now Ph.D. student, Texas A&M University
- 2) Ben Gibson (2021-2023); Completed B.S. Chemistry 2023; Now: Research Associate, Group G1
- 3) Jaret Manley (2021-2023); Completed B.S. Chemistry 2023; Now Graduate Student, Texas State University
- 4) Cory Silguero (2021-2023); Completed B.S. Chemistry 2023; Now: Now Ph.D. student, University of Texas at Austin
- 5) Camden Caffey (2021-2023); Completed B.S. Chemistry 2023; Now: Research Technician, Houston Methodist Hospital

- 4) Cole Mough (2021-2022); Completed B.S. Chemistry 2022; Now: Scientist, Group G1
- 5) Brooke Davis (2021-2022); Completed B.S. Chemistry 2022; Now: Scientist, Tesla
- 6) Zachary Naymik (2020-2021); Completed B.S. Chemistry 2021; Now: Ph.D. student, Texas State University
- 7) Vivian Kuykendall (2020-2021); Completed B.S. Chemistry 2021; Now; Scientist, Texpower (Houston, TX)
- 9) Micheal Urena (2020-2021) ; Completed B.S. Chemistry 2021, Now: Electrochemical Materials Technologist, Sandia National Laboratories
- 8) Thomas Tobolka (2019-2020), Completed B.S. Chemistry 2021
- 9) Jalen Schilling (2020)
- 10) Kristen Pollok (Summer REU Student, 2019)
- 11) Ashley Moreno (2018-2019); Completed B.S. Chemistry 2019
- 12) Samuel Kimmel (2017-2018); Completed B.S. Chemistry 2018; Now: Ph.D. Student, Chemistry Department, Texas State University
- 13) Noel Mireles Villegas (2017-2018); Completed B.S. Chemistry 2018; Now: Graduate Student, Chemistry Department, Texas A&M University
- 14) Luis Albiter (2014-2018); Completed B.S. Chemistry 2018; Now: Ph.D. Student, Texas State University
- 15) Robert Meyer (Summer REU Student, 2018); Now: Undergraduate student at Georgetown University
- 16) Shraddha Acharya (2016-2017); Completed B.S. Chemistry 2018
- 17) Randall Archer (2015-2016); Graduated B.S. Chemistry, 2016, Now: Analytical Chemist, Chemicals, Inc.
- 18) Carol Ly (2014-2016); Completed B.S. Chemistry 2016; Now: Graduate Student, Chemistry Department, Texas A&M University
- 19) Benito Resendiz (2015); Graduated B.S. Physics, 2015; Now: Laboratory Assistant at Oregon Health & Science University
- 20) Campbell Saint-Vincent (Summer REU Student, 2015); Now: Undergraduate student at Texas Lutheran University
- 21) Ryan McFeron (2015); Graduated B.S. Biology, 2015; Now: Engineering Technician, Entegris
- 22) David Jaime (2014-2015); Completed B.S. Chemistry 2018
- 23) Nicole Lambdin (2014-2015); Graduated B.S. Chemistry, 2015; Now: Associate Chemist, Blueshift International Materials
- 24) Audrey Zaleski (2014-2016); Completed B.S. Chemistry 2016; Now: Technician, Tokyo Electron

High School Student Mentoring

High Students Mentored – Former Students

Avery Landry (2021): Now: Undergraduate chemistry student at University of Texas at Austin

Postdoctoral Associate Mentoring

Postdoctoral Associates Mentored - Current Students

- Dr. Jesus Adame Solorio, Postdoctoral Research Associate (2023-present)
- Dr. Fernando Godinez Salomon, Visiting International Scholar from Instituto Politécnico Nacional, Mexico (2015), Postdoctoral Research Associate (2016-present)

Postdoctoral Associates Mentored – Former Students

- Dr. Sanjaya Dulip Perera, Postdoctoral Research Associate (2015-2016); Current Position: Senior Research Scientist, Axium Nano, Los Angeles, CA

F. Student Awards

- 1) Luis Albiter, Doctoral Retention Tuition Scholarship, Texas State University, 2023
- 2) Cory Silguero, CNS Dean's Strategic Fellowship, University of Texas at Austin, 2023
- 3) Sam Kimmel, Office of Naval Research (ONR) Naval Research Enterprise Internship Program (NREIP) Award, 2023
- 4) Sam Kimmel, Future Texas Business Legend, Texas Business Hall of Fame, 2022
([link to article](#) and [link to award](#))
- 5) Ben Gibson, Bring Bobcats Back – UFCU Scholars award, Fall 2022
- 6) Ben Gibson, Chemistry & Biochemistry Catalyst Scholarship, Texas State University, 2022
- 7) Michael Urena, Ross Compton Award, Department of Chemistry and Biochemistry, Texas State University, 2022
- 8) Kathleen Bailey, Larry D. Herwig Research Scholarship, Department of Chemistry & Biochemistry, Texas State University, 2022
- 9) Cole Mough, ACS Award in Inorganic Chemistry, Department of Chemistry & Biochemistry, Texas State University, 2022
- 10) Brooke Davis, Outstanding Undergraduate Instructional Assistant, Department of Chemistry & Biochemistry, Texas State University, 2022
- 11) Cole Mough, Outstanding Undergraduate Research Student Award, Department of Chemistry & Biochemistry, Texas State University, 2022
- 12) Luis Albiter, Graduate College Scholarship – Science & Engineering, Texas State University, 2022
- 13) Samuel Kimmel, Bonnie and Lawrence Tilton Endowed Fellowship in Business, Texas State University, 2022
- 14) Sam Kimmel, H.C Vivian Memorial Endowment Scholarship, 2022
- 15) Sam Kimmel, James H. and Helen S. Dotson Family Scholarship, 2022
- 16) Samuel Kimmel, Jesse and Betty Luxton Endowed Graduate Research Fellowship, Texas State University, 2022
- 17) Samuel Kimmel, Gary V. Woods Scholarship, 2022
- 18) Samuel Kimmel, Graduate College Scholarship - Science & Engineering, Texas State University, 2022
- 19) Kathleen Bailey, Best REU Poster Presentation Award, 2021
- 20) Samuel Kimmel, 2021 Naval Research Enterprise Internship Program Award
- 21) Samuel Kimmel, 2nd place, 2021 M.S.E.C. Business Plan competition, Texas State University, May 2021
- 22) Samuel Kimmel, Bobcat to Bobcat Scholarship, 2021
- 23) Samuel Kimmel, Graduate College Scholarship, Texas State University, 2021
- 24) Samuel Kimmel, Best virtual Presentation Award, Student Technology and Research Showcase, Materials Science, Engineering and Commercialization Program, MSEC Seminar and Commercialization Forum, December 2020
- 25) Vivian Kuykendall, 2020 Excellence in Laboratory Research Award, Department of Chemistry & Biochemistry, Texas State University, 2020
- 26) Michael Urena, Undergraduate Research Fellowship for Fall 2020
- 27) Luis Albiter, SRC Education Alliance Award, 2020
- 28) Luis Albiter, Doctoral Merit Fellowship, 2020
- 29) Samuel Kimmel, Naval Research Enterprise Internship Program (NREIP), 2020.
- 30) Samuel Kimmel, Outstanding Chemistry Graduate Student Award, 2020
- 31) Yuanfang Ying, Dissertation Research Support Fellowship, 2020
- 32) Jesus Adame, Dissertation Research Support Fellowship, 2020
- 33) Samuel Kimmel, Thesis Research Support Fellowship, 2019
- 34) Luis Albiter, Thesis Research Support Fellowship, 2019
- 35) Lupita Aguirre, Thesis Research Support Fellowship, 2019

- 36) Samuel Kimmel, Naval Research Enterprise Internship Program (NREIP), 2019.
- 37) Kristen Pollok, Best REU Poster Presentation Award, 2019.
- 38) Samuel Kimmel, Naval Research Enterprise Internship Program (NREIP), 2018.
- 39) Randall Archer, Best Oral Presenter Award, Inaugural Chemistry & Biochemistry Research Colloquium, April 20, 2018.
- 40) Randall Archer, Thesis Research Support Fellowship, Texas State University, 2018
- 41) Randall Archer, Honorable Mention, "Titanium Oxide Nanosheets for Proton-Exchange Membrane Oxygen Evolution Electrocatalysts", Polymer Electrolyte Fuel Cells 17 Symposium Poster Session, 232nd *Electrochemical Society Meeting*, National Harbor, MD, October 1-5, 2017.
- 42) Yuanfang Ying, Thesis Research Support Fellowship, 2017
- 43) Randall Archer, Larry and Barbara Wright Scholarship, Fall 2017
- 44) Sibio Niu, Thesis Research Support Fellowship, 2016
- 45) Campbell Saint-Vincent, Best REU Poster Award, 2015

G. Teaching Development Seminars and Workshops

- 1) Completed Entering Mentoring Training, Texas State University, 2021
- 2) Texas State University Program for Excellence in Teaching and Learning Series, 2014-2015

3. Service Activities

A. Institutional Service

University Service

- 1) Continuity of Research Pandemic Work Group Member, Texas State University, 2020

College Service

- 1) Chair, Ad Hoc Academic Program Review Committee, Materials Science, Engineering, and Commercialization (MSEC) program, 2023-present
- 2) Committee Member, Student Review Ad Hoc Committee, Materials Science, Engineering, and Commercialization (MSEC) program, 2023-present
- 3) Committee Member, Ad Hoc Committee on Candidacy Exam Expectations, Materials Science, Engineering, and Commercialization (MSEC) program, 2022-2023
- 4) Committee Member, Ad Hoc Committee on Candidacy Exam Expectations, Materials Science, Engineering, and Commercialization (MSEC) program, 2022-2023
- 5) Committee Member, Shared Research Operations (SRO) Senior Lab Services Technician Search Committee, 2020
- 6) Committee Member, Ad hoc Committee on Materials Applications Research Center (MARC) Equipment Acquisition, 2019
- 7) Panelist, "Becoming a Productive Scholar and Researcher", New Tenure-Track Orientation, Texas State University, San Marcos, TX, August 21, 2019
- 8) Chair, Student Research Productivity Expectations Committee, Materials Science, Engineering, and Commercialization Program, 2018-2019
- 9) Distinguished Research Panelist, Tenth Annual Research Conference for Graduate Students, Texas State University, San Marcos, TX, November 13, 2018.

Department Service

- 1) Committee Member, Faculty Evaluation Committee, Department of Chemistry and Biochemistry, 2023-2026
- 2) Committee Member, Search Committee for Assistant/Associate Professor, Department of Chemistry and Biochemistry, 2023-present
- 3) Committee Member, Scholarship Committee, Department of Chemistry and Biochemistry, 2021-present

- 4) Mentor for new Assistant Professor (Dr. David Schilter), Department of Chemistry and Biochemistry, 2022-present
- 5) Committee Member, Space Committee, Department of Chemistry and Biochemistry, 2021-present
- 6) Equipment manager, Fourier Transform Infrared spectrometer (FTIR), 2015-present
- 7) Equipment manager, Nitrogen physisorption instrument, 2015-present
- 8) Committee Member, Graduate Chemistry Curriculum Committee, Department of Chemistry and Biochemistry (2020-present)
- 9) Committee Member, Undergraduate Chemistry Curriculum Committee, Department of Chemistry and Biochemistry (2020-present)
- 10) Committee Member, Search Committee for Assistant Professor, Tenure-track, Physical Chemistry, Department of Chemistry and Biochemistry, 2021-2022
- 11) Volunteer for Chemistry and Biochemistry Table at Bobcat Days, November 2021
- 12) Chair, Search Committee for Assistant Professor, Tenure-track, Analytical or Physical Chemistry, Department of Chemistry and Biochemistry, 2020-2021
- 13) Committee Member, Ad hoc Admin II Search Committee, Department of Chemistry and Biochemistry, 2019
- 14) Contributed to establishment of \$25,000 endowed student scholarship fund to Texas State University Department of Chemistry and Biochemistry by the Society of Plastics Engineers (SPE) entitled "The Bonita Thomas Favorite Society of Plastics Engineers South Texas Section Endowed Scholarship", 2015
- 15) Faculty Advisor, Society of Plastics Engineers (SPE) Student Chapter at Texas State University – San Marcos, 2015-2019
- 16) Member, Safety Committee, 2015-2021
- 17) Member, Equipment Committee, 2014-2015, 2017-2021
- 18) Chair, Equipment Committee, 2015-2016
- 19) Member, Physical Chemistry Faculty Search Committee, 2016-2017

B. Professional Service

General

- 1) Editorial Advisory Board Member, Energy and Environmental Materials, Wiley (2019-present)
- 2) Secretary/Treasurer for the Electrochemical Society (ECS) Texas Section (2018-present)
- 3) Session Chair, 242th *Electrochemical Society Meeting (Symposium I01F – Proton Exchange Membrane Electrocatalysts/Electrodes)*, Atlanta, GA, October 10-14, 2022.
- 4) Electrochemical Society (ECS) Texas Section Travel Grant Reviewer, 2020-present
- 5) Session Chair, 240th *Electrochemical Society Meeting (Symposium I01B - Polymer Electrolyte Fuel Cells & Electrolyzers 21, Session 2: Catalyst Layer Ink Preparation & Subzero Operation and Cooling)*, Virtual Meeting, October 10-14, 2021.
- 6) Session Chair, *PRiME 2020, International Symposium of the Electrochemical Society (Symposium I01F I01F-32 Electrolysis: Electrocatalysis and Systems, Virtual Meeting, October 4-9, 2020.*
- 7) Session Co-chair, 236th *Electrochemical Society Meeting (Symposium I01 – Polymer Electrolyte Fuel Cells & Electrolyzers 19, Section F-32, Polymer-Electrolyte Electrolysis)*, Atlanta, GA, October 13-17, 2019.
- 8) Session Co-chair, *Americas International Meeting on Electrochemistry and Solid-State Science (AiMES) 2018 (Symposium I01 – Polymer Electrolyte Fuel Cells and Electrolyzers 18, Section F-3.2, Acidic Oxygen Evolution)*, Cancun, Mexico, September 30 - October 4, 2018.
- 9) Session Co-Chair, *Americas International Meeting on Electrochemistry and Solid-State Science (AiMES) 2018 (Symposium I01 – Polymer Electrolyte Fuel Cells and Electrolyzers 18, Section D-2.2, Pt-Alloy Cathode Catalysts and Catalyst Layers)*, Cancun, Mexico, September 30 - October 4, 2018.
- 10) Symposium Organizer for "Batteries Beyond Li-Ion: JCESR Highlights" 232nd *Electrochemical Society Meeting*, National Harbor, MD, Oct 1-6, 2017.

- 11) Session Chair, Symposium A05: Lithium-Ion Batteries and Beyond, 231th *Electrochemical Society Meeting, New Orleans, LA, May 28-June 2, 2017.*
- 12) Session Chair, Symposium ES3: Materials for Multivalent Electrochemical Energy Storage, *MRS Spring 2017 Meeting, Phoenix, AZ, April 17-21, 2017.*
- 13) Session Chair, Inorganic Materials Session, *Partnerships for Research and Education in Materials (PREM) 2016 Summer Research Conference, San Marcos, Texas, June 27-28, 2016.*
- 14) Co-chair, Minisymposium: Multiphysics Coupling in Energy Storage, *ASME International Mechanical Engineering Congress and Exposition, Houston, Texas, November 13-19, 2015.*
- 15) Invited commentator for Chemical and Engineering News (C&EN)

Reviewer for Journals

- *Journal of the American Chemical Society, Scientific Reports, Chemistry of Materials, ACS Nano, ACS Catalysis, Chemical Communications, Journal of the Electrochemical Society, Journal of Power Sources, RSC Advances, International Journal of Hydrogen Energy, New Journal of Chemistry, Energy & Environmental Materials, Journal of Applied Polymer Science, ACS Applied Energy Materials, Journal of Materials Chemistry A, ACS Applied Materials & Interfaces, Catalysis Science and Technology, Energy and Fuels, ACS Materials Au*

Proposal Reviewer

- 1) Served as a reviewer for proposals to the National Science Foundation, Catalysis Panel, 2023
- 2) Served as a reviewer for proposals to the National Science Foundation, Catalysis Panel, 2022
- 3) Served as a reviewer for proposals to Research Corporation for Science Advancement (RCSA), 2022
- 4) Served as a reviewer for proposals to Research Corporation for Science Advancement (RCSA), 2021
- 5) Served as a reviewer for proposals to the National Science Foundation, Emerging Frontiers in Research and Innovation program, 2021
- 6) Served as a reviewer for proposals to the National Science Foundation, Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET) program, 2021
- 7) Served as a reviewer for proposals to the National Science Foundation, Emerging Frontiers in Research and Innovation program, May 2020
- 8) Served as a reviewer for proposals to the National Science Foundation, Emerging Frontiers in Research and Innovation program, January 2020
- 9) Served as a reviewer for proposals to National Science Foundation FY19 Designing Materials to Revolutionize and Engineer our Future (DMREF), 2019
- 10) Reviewer for proposal to Army Research Office, 2010

Professional Organization Membership/Affiliations

- The Electrochemical Society
- Materials Research Society
- American Chemical Society

C. Community Service

- 1) Developed video module for 8th grade students entitled “Water Electrolysis: Principles and Chemical Equations” that was utilized in all 8th grade science classes in San Marcos, Texas public schools (Miller Middle School and Goodnight Middle School) with an estimated ~500-600 students, 2021
- 2) Distinguished Panelist, Career Panel for high schools students with specialization in STEM, The Academy of Science and Technology, Lone Star College, October 26, 2021
- 3) Member of STEM Undergraduate Research Experience (SURE) Program to mentor 1st generation undergraduate students under Department of Education-funded Research Experiences for Undergraduates project, Summer 2017.
- 4) Hosted students in Undergraduate STEM Open House, San Marcos, TX, Friday, April 14, 2017.

- 5) Hosted students from San Marcos High School for laboratory visit, San Marcos, TX, February 25, 2016
- 6) Presented interactive chemistry show to local middle students (Miller middle school, San Marcos, TX, September 30, 2015)
- 7) Hosted local middle and high school students (Miller and Goodnight middle school, San Marcos High School) in laboratory for STEM open house, San Marcos, TX, May 1, 2015
- 8) Presented interactive science experiments with elementary school students at Family Science Night, Blanco Vista Elementary School, San Marcos, TX Mar. 26, 2015
- 9) Hosted 5th graders from Hernandez Elementary School in performing interactive science experiments, San Marcos, TX, Jan. 2015
- 10) Participated in St. Phillips College 5th Annual Science, Technology, Engineering, and Mathematics (STEM) Symposium, San Antonio, Texas, Dec. 2014
- 11) Hosted visit of Texas State Summer REU (Research Experience for Undergraduates) students to visit Southwest Research Institute (San Antonio, TX) for industry visit, Aug. 2014

4. Honors and Awards

- 1) College Achievement Award, Excellence in Scholarly/Creative Activities, College of Science and Engineering, Texas State University, 2023
- 2) Teaching Award of Honor, Texas State Alumni Association, 2020
- 3) Presidential Award for Excellence in Scholarly/Creative Activity, Texas State University, 2018
- 4) Scialog Fellow for Advanced Energy Storage, Research Corporation for Science Advancement, 2017
- 5) College Achievement Award for Excellence in Scholarly/Creative Activities, College of Science and Engineering, Texas State University, 2017
- 6) Recipient of the Electrochemical Society Young Professional Travel Grant, Battery Division, 2017
- 7) Presidential Distinction Award for Excellence in Service, Texas State University, 2016
- 8) Recipient of the Electrochemical Society Young Professional Travel Grant, Physical and Analytical Electrochemistry Division, 2016
- 9) Recipient of the Electrochemical Society Young Professional Travel Grant, Battery and Energy Storage Division, 2015
- 10) R.A. Glenn Award for the Outstanding Fuel/Petroleum Paper at the 231st Meeting of the American Chemical Society, 2007
- 11) Co-recipient of the R.A. Glenn Award for the Outstanding Fuel/Petroleum Paper at the 231st Meeting of the American Chemical Society, 2007
- 12) Dissertation Award for Science and Engineering, University of Oklahoma, 2001
- 13) Chemistry Graduate Assistant Award for Research, University of Oklahoma, 2000
- 14) Magna Cum Laude graduate, Texas A&M University, 1992
- 15) Outstanding Chemistry Student Award, Texas A&M University, 1992
- 16) Chemistry Achievement Award, Texas A&M University, 1991

5. Additional Professional Training

- Supervision and Management
 - CareerTrack Supervisor Training, February 2010
 - CareerTrack Management Training, June 2008
- Commercialization
 - Navy SBIR Transition Assistance Program, 2010–2011, 2011–2012, 2012-2013
 - Commercialization Assistance Program, Development Capital Networks, National Science Foundation, SBIR Phase II Program, 2007

- Project Management
 - Project Management Training, Lynntech, Inc., 2012
 - Microsoft Project Training, January 2010