Thomas M. Arruda, PhD

Assistant Professor
Department of Chemistry
Salve Regina University
Newport, RI 02840
155 O'Hare Academic Building
ORCID ID:0000-0002-6165-2024

Phone: 401.341.2467
Thomas.arruda@salve.edu
Researcher ID: C-6134-2012
H-index: 16
Google Scholar Profile

Education

Northeastern University (Boston, MA)
PhD in Chemistry, 29 January, 2010
Thesis in *physical* chemistry, advisor: Sanjeev Mukerjee, PhD
Title: X-ray absorption spectroscopy investigations into the stability and activity of fuel cell electrocatalysts

University of Massachusetts (N. Dartmouth, MA)
B.S. in Chemistry, Cum Laude, January 2004
Undergraduate research advisor: Russell R. Bessette, PhD
Research performed at the Naval Undersea Warfare Center, Newport, RI

Academic Employment

2013-present	**Assistant Professor of Chemistry** Salve Regina University, Newport, RI
2010-2013	**Postdoctoral Research Associate** Center for Nanophase Material Sciences Oak Ridge National Laboratory, Oak Ridge, TN
2006-2009	**Research Assistant** Northeastern University, Boston, MA
2004-2006	**Teaching Assistant, Chemistry** Northeastern University, Boston, MA
2002-2004	**Research Intern, Electrochemical Power Systems** Naval Undersea Warfare Center (NUWC), Newport, RI

Grants, Honors and Awards

2018	EPSCoR RID Grant
2016	Student Collaborative and Integrated Grant for Research, Artistic or Creative Projects
2012	Ceramographic Competition Award (second place): "Liquid Piezoresponse Force Microscopy" American Ceramic Society
2012	Ceramographic Competition Award (third place): "Nanoscale Lithium Anodes" American Ceramic Society
2009	Chemistry Graduate Leadership Award (NU)
2004	Brian A. Rose Award (UMASS Dartmouth)
2003	American Chemical Society Analytical Division Award

Courses Taught

CHM 113 General Chemistry I: SRU
CHM 113L General Chemistry I Lab: SRU
CHM 114 General Chemistry II: SRU
CHM 114L General Chemistry II Lab: SRU
CHM 305 Physical Chemistry I: SRU
CHM 305L Physical Chemistry I Lab: SRU
CHM 306 Physical Chemistry II: SRU
CHM 306L Physical Chemistry II Lab: SRU
CHM 410 Topics in Chemistry and Research: SRU
CHM 497 Undergraduate Research I: SRU
CHM 498 Undergraduate Research II: SRU
General Chemistry Recitations: Northeastern University 2004-2006

- Honors Chemistry for Engineers (2 Semesters)
- Chemistry for Engineers (2 Semesters)
- Chemistry for Nursing Majors (2 Semesters)

General Chemistry Laboratory: Northeastern University: 2005 Summer
General Chemistry Laboratory: UMASS Dartmouth: 2003-2004

University Service

- Nominations and Elections (2018/2019-2020/2021)
- Curriculum Committee 2015/2016-2017/2018(chair in 2016/2017)
- Academic Integrity Task Force (2014)
- Faculty Social Committee (co-chair 2015)
- Faculty Search Committees (Depts. Chemistry, Nursing)
- Search Committee (Chemical Hygiene Officer/Lab Coordinator, 2018)
- Search Committee for Associate Director of McKillop Library, 2017/2018
- Chemical Hygiene Officer (2014-2018)

Professional Service

- Peer reviewer: Advanced Materials; Advanced Electronic Materials; Nanoscale; Physical Chemistry Chemical Physics; ChemElectroChem; ChemPhysChem; ChemSusChem; RSC Advances; Chemistry – A European Journal, International Journal Hydrogen Energy; New Journal of Chemistry; ChemistrySelect.
- Grant reviewer: ACS PRF.
- Grant reviewer: NSF EPSCoR RII Track 4.
- Host: Rhode Island NASA Space Grant Consortium Annual Symposium, April 25, 2015.
- Guest Editor: *Journal of Chemistry*, Special Issue: "Experimental Simulation of Multiscale and Multiphysics Phenomena in Novel Engineering Systems" expected publication December 2018.
- Symposium Session Chair, F1 Characterization of Interfaces and Interphases, 225th Electrochemical Society meeting, Orlando FL, May 11-15, 2014.

Professional Memberships

- Member: Electrochemical Society
- Member: American Chemical Society
- Member: Union of Concerned Scientists
- Affiliate member: Rhode Island Space Grant (NASA)

Public Service

- Judge: Rhode Island State Science and Engineering Fair (2014, 2015, 2017, 2018)
- Judge: Science Fair at Rogers High School, Newport RI (2017)
- Host 5th graders Blackstone Valley Elementary School, May 2017

Peer-Reviewed Journal Article Publications **(*Salve Regina Student)**

1. Lawton, J. S.; Tiano, S. M.;***** Donnelly, D. J.;***** Flanagan, S. P.***** and **Arruda, T. M**., The Effect of Sulfuric Acid Concentration on Physical and Electrochemical Properties of Vanadyl Solutions, *Batteries*, 4, **In Press 2018**.
   Special Issue on "*Vanadium Redox Flow Battery and Its Applications*"

2. Papandrew, A.; St. John, S.; Elgammal, R.; Wilson, D.; Atkinson III, R.; Lawton, J. S.; **Arruda, T. M.;** and Zawodzinski, T. A., Vapor-Deposited Pt and Pd-Pt Catalysts for Solid Acid Fuel Cells: Short Range Structure and Interactions with the CsH_2PO_4 Electrolyte, *J. Electrochem. Soc.*, **2016**, 163(6), F464-F469.

3. Farrow, T.; Yang, N.; Doria, S.; Belianinov, A.; Jesse, S.; **Arruda, T. M**.; Balestrino, G.; Kalinin, S. V.; Kumar, A., Sub-nA Spatially Resolved Conductivity Profiling of Surface and Interface Defects in Ceria Films, *APL Materials*, **2015**, 3, 036106-7.

4. Martin, D.; Muller, J.; Schenk, T.; **Arruda, T. M**.; Kumar, A.; Strelcov, E.; Yurchuk, E.; Muller, S.; Pohl, D.; Schroder, U.; Kalinin, S. V.; Mikolajick, T., Ferroelectricity in Si-doped HfO2 Revealed: A Binary Lead-free Ferroelectric, *Adv. Mater*.,**2014**, 26(48), 8198.

5. **Arruda, T. M**.; Lawton. J. S.; Kumar, A.; Unocic, R. R.; Kravchenko, I. I.; Zawodzinski, T. A.; Jesse, S.; Kalinin, S. V.; Balke, N., In Situ Formation of Micron-Scale Li-Metal Anodes with High Cyclability, *ECS Electrochem. Lett*., **2014**, 3(1), A4-A7.

6. Yang, N.; Doria, S.; Kumar, A.; Hyuak Jang, J.; **Arruda, T. M**.; Tebano, A.; Jesse, S.; Ivanov, I. N.; Baddorf, A. P.; Strelcov, E.; Licoccia, S.; Borisevich, A. Y.; Balestrino, G.; Kalinin, S. V., Water-Mediated Electrochemical Nano-Writing on Thin Ceria Films, *Nanotechnology*, **2014**, 25(7), 075701.

7. Doria, S.; Yang, N.; Kumar, A.; Jesse, S.; Tebano, A.; Aruta, C.; Di Bartolomeo, E.; **Arruda, T. M.**; Kalinin, S. V.; Licoccia, S.; Balestrino, G., Nanoscale Mapping of Oxygen Vacancy Kinetics in Nanocrystalline Samarium Doped Ceria Thin Films, *Appl. Phys. Lett*., **2013**, 103, 171605.

8. Dubourdieu, C.; Bruley, J.; **Arruda, T. M.**; Posadas, A.; Jordan-Sweet, J.; Frank, M. M.; Cartier, E.; Frank, D. J.; Kalinin, S. V.; Demkov, A.; Narayanan, V., Ferroelectric Switching of Epitaxial $BaTiO_3$ films on Silicon Without Conducting Bottom Electrode, *Nature Nanotech.*, **2013**, 8(10), 478-754.

9. Kumar, A.; Chen, C.; **Arruda, T. M.**; Jesse, S.; Ciucci, F.; Kalinin, S. V., Frequency Spectroscopy of Irreversible Electrochemical Nucleation Kinetics on the nanoscale, *Nanoscale*, **2013,** 5, 11964-11970.

10. **Arruda, T. M.**; Kumar, A.; Jesse, S.; Veith, G. M.; Tselev, A.; Baddorf, A. P.; Balke, N.; Kalinin, S. V., Towards Quantitative Electrochemical Measurements on the Nanoscale by Scanning Probe Microscopy: Environmental and Current Spreading Effects, *ACS Nano*, **2013**, 7(9), 8175-8182.

11. Kumar, A; **Arruda, T. M.**; Tselev, A.; Ivanov, I. N.; Lawton, J. S.; Zawodzinski, T. A.; Butyaev, O.; Zayats, S.; Jesse, S.; Kalinin, S. V., Nanometer-scale Mapping of Irreversible Electrochemical Nucleation Processes on Solid Li-ion Electrolytes, *Sci. Rep.*, **2013**, 3, 1621-8.

12. **Arruda, T. M.**; Heon, M.; Presser, V.; Hillesheim, P. C.; Dai, S.; Gogotsi, Y.; Kalinin, S. V.; Balke, N., In Situ Tracking of the Nanoscale Expansion of Porous Carbon Electrodes, *Energy Environ. Sci.*, **2013**, 6(1), 225-231.

13. Kalinin, S. V.; Kim, Y.; Kumar, A.; Strelcov, E.; Balke, N.; **Arruda, T. M**.; Jesse, S.; Leonard, D.; Borisevich, A., Electrochemical Strain Microscopy: Probing Electrochemical Transformations in Nanoscale Volumes, *Microsc. Today*, **2012**, 20(6), 10-15.

14. Balke, N.; Tselev, A.; **Arruda, T. M.**; Jesse, S.; Chu, Y-H.; Kalinin, S. V., Probing Local Electromechanical Effects in Highly Conductive Electrolytes, *ACS Nano*, **2012**, 6(11), 10139-10146.

15. **Arruda, T. M.**; Kumar, A.; Kalinin, S. V.; Jesse, S., The Partially Reversible Formation of Li-metal Particles on a Solid Li Electrolyte: Applications Toward Nanobatteries, *Nanotechnology*, **2012**, 23(32), 325402.
Media coverage: http://phys.org/news/2012-08-explore-li-air-battery-reversibility-nanoscale.html

16. Kramm, U. I.; Herranz, J.; Larouche, N.; **Arruda, T. M.**; Lefevre, M.; Jaouen, F.; Bogdanoff, P.; Fiechter, S.; Abs-Wurmbach, I.; Mukerjee, S.; Dodelet, J-P., Structure of the Catalytic Sites in Fe/N/C-catalysts for O_2-reduction in PEM Fuel Cells, *Phys. Chem. Chem. Phys*, **2012**, 14(33), 11673-11688.

17. Jesse, S.; Kumar, A.; **Arruda, T. M.**; Kim, Y.; Kalinin, S. V.; Ciucci, F., Electrochemical Strain Microscopy: Probing Ionic and Electrochemical Phenomena in Solids at the Nanometer Level, *MRS Bull*., **2012**, 37(7),651-658.

18. Kumar, A.; **Arruda, T. M**.; Kim, Y.; Ivanov, I. N.; Jesse, S.; Bark, C. W.; Bristowe, N. C.; Artacho, E.; Littlewood, P. B.; Eom, C. –B.; Kalinin, S. V., Probing Surface and Bulk Electrochemical Processes on the $LaAlO_3$-$SrTiO_3$ Interface, *ACS Nano*, **2012**, 6(5), 3841-3852.

19. Kalinin, S. V.; Kumar, A., Balke, N.; McCorkle, M.; Guo, S.; **Arruda, T.** and Jesse, S. ESM of Ionic and Electrochemical Phenomena on the Nanoscale, *Adv. Mater. Proc.*, **2011**, 169(11), 30-34.

20. Kalinin, S. V,; Balke, N.; Jesse, S.; Tselev, A.; Kumar, A.; **Arruda, T. M.**; Guo, S.; Proksch, R., Electrochemical Strain Microscopy of Li-ion Conductive Materials for Energy Generation and Storage, *Mater. Today*, **2011,** 14(11), 548-558.

21. **Arruda, T. M.**; Kumar, A.; Kalinin, S. V.; Jesse, S., Mapping Irreversible Electrochemical Processes on the Nanoscale: Ionic Phenomena in Li-ion Conductive Glass Ceramic, *Nano Lett.*, **2011**, 11(10), 4161-4167.

22. Herranz, J.; Jaouen, F.; Lefevre, M.; Kramm, U. I.; Proietti, E.; Dodelet, J.-P.; Bogdanoff, P.; Fiechter, S.; Abs-Wurmbach, I.; Betrand, P.; **Arruda, T. M.**; Mukerjee, S., Unveiling N-Protonation and Anion-Binding Effects on Fe/N/C Catalysts for O2 reduction in Proton-Exchange-Membrane Fuel Cells, *J. Phys. Chem. C*, **2011**, 115 (32), 16087-16097.

23. Audette, G. F.; Lombardo, S.; Dudzik, J.; **Arruda, T. M.**; Kolinski, M.; Filipek, S.; Mukerjee, S.; Kannan, A. M.; Thavasi, V.; Ramakrishna, S.; Chin, M.; Somasundaran, P.; Viswanathan, S.; Keles, R. S.; Renugopalakrishnan, R., Protein Hot Spots at Bio-Nano Interfaces, *Mater. Today*, **2011**, 14(7-8), 292-298.

24. Gillette, S. M.; Geiler, A. L.; Chen, Z.; Chen, Y.; **Arruda, T.**; Xie, C.; Wang, L.; Zhu, X.; Liu, M.; Mukerjee, S.; Vittoria, C. and Harris, V. G., Active Tuning of a Microstrip Hairpin-line Microwave Bandpass Filter on a Polycrystalline Yttrium Iron Garnet Substrate Using Small Magnetic Fields, *J. Appl. Phys.*, **2011**, 109, 07A513.

25. **Arruda, T. M.**; Shyam, B.; Lawton, J. S.; Ramaswamy, N.; Budil, D. E.; Ramaker, D. E.; and Mukerjee. S, Fundamental Aspects of Spontaneous Cathodic Deposition of Ru onto Pt/C Electrocatalysts and Membranes under Direct Methanol Fuel Cell Operating Conditions: An In situ X-ray Absorption Spectroscopy and Electron Spin Resonance Study, *J. Phys. Chem. C*, **2010**,114(2), 1028-1040.

26. Shyam, B.; **Arruda, T. M.**; Mukerjee, S. and Ramaker, D.E., Effect of RuOxHy Particles Size on Particle Aging in Methanol, *J. Phys. Chem. C*., **2009**, 113(45), 19713-19721.

27. Ramaswamy, N.; **Arruda, T. M**.; Wen, W.; Hakim, N.; Saha, M.; Gulla, A.; Mukerjee, S., Enhanced Activity and Interfacial Durability Study of Ultra Low Pt Based Electrocatalysts Prepared by Ion Beam Assisted Deposition (IBAD) Method, *Electrochim. Acta*, **2009**,54,(26), 6756-6766.

28. Mukerjee, S.; Ziegelbauer, J.; **Arruda, T**.; Ramaker, D.E.; Shyam, B., Understanding Electrocatalytic Pathways in Low and Medium Temperature Fuel Cells: Synchrotron-based in Situ X-ray Absorption Spectroscopy, *ECS Interface*, **2008**, 17(4), 46.

29. **Arruda, T. M.**; Shyam, B.; Ziegelbauer, J. M.; Ramaker, D. E.; Mukerjee, S., Investigation into the Competitive and Site-Specific Nature of Anion Adsorption on Pt Using In Situ X-ray Absorption Spectroscopy, *J. Phys. Chem. C*, **2008**, 112(46), 18087-18097.

Book Chapters

1. Mukerjee, S.; **Arruda, T. M.**; Ziegelbauer, J.; Artyushkova, K.; Atanassov, P., In Situ X-ray Spectroscopy of Enzymatic Catalysis: Laccase-Catalyzed Oxygen Reduction, Chapter 15, *Enzymatic Fuel Cells: From Fundamentals to Applications*, H. Luckarift, P. Atanassov, G. Johnson (Eds). **2014.**

2. **Arruda, T. M.**; Balke, N.; Jesse, S.; Kalinin, S. V., Ch. 15 - Electrochemical Strain Microscopy of Li-ion and Li-air Battery Materials, *Scanning Probe Microscopy for Energy Research*, World Scientific Press, **2013**.

3. Mukerjee, S. and **Arruda, T**., In Situ Spectroscopic Studies of Electrocatalysis on Highly Dispersed Nano-Materials, *Theory and Experiment in Electrocatalysis*, Modern Aspects of Electrochemistry 50, Springer Science, **2010**.

Conference Proceeding Articles

1. Mueller, J.; Boescke, T. S.; Mueller, S.; Yurchuk, E.; Polakowski, P.; Paul, J.; Martin, D.; Schenk, T.; Khullara, K.; Kersch, A.; Weinreich, W.; Riedel, S.; Kumar, A.; **Arruda, T. M**.; Kalinin, S. V.; Schloesscr, T.; Boschke, R.; van Bentum, R.; Schroeder, U. and Mikolajick, T., Ferroelectric Hafnium Oxide: A CMOS-compatible and Highly Scalable Approach to Future Ferroelectric Memories, *IEEE Explore*, **2013**, 280-283.

2. **Arruda, T. M**.; Shyam, B.; Ziegelbauer, J. M.; Ramaker, D. and Mukerjee, S.; In situ XAS Investigation of Electrocatalyst Poisoning by Halides, *ECS Transactions*, **2007**, 11(1) 903-911.

3. Shyam, B.; **Arruda, T**.; Ziegelbauer, J. M.; Mukerjee, S. and Ramaker, D. E., Observation of PtRu Particle Aging in Methanol with X-ray Absorption Spectroscopy, *ECS Transactions*, **2007**, 11**(**1), 1359.

4. Bessette, R. R.; **Arruda, T. M**.; Patrissi, C. J.; Tucker, S. P.; Carreiro, L. G.; Medeiros, M. G. and Deschenes, C. M., Catalysis, Architecture and the Electrochemical

Performance of Microfibrous Cathodes for Hydrogen Peroxide-Based Fuel Cells, *Proceedings of the Power Sources Conference*, 41st, 424-427, **2004**.

US Patents

1. Jesse, S.; Kumar, A.; **Arruda, T**.; Kalinin, S., Method for local probing of irreversible electrochemical reactions and bias- and temperature- induced transformations, US Patent disclosure filed, **2011**.

2. Patrissi, C. J.; Bessette, R. R.; Carreiro, L. G.; Kim, Y. K.; **Arruda, T. M**. and Deschenes, C. M., Method for Increasing Fiber Density in Electrostatic Flocking, U. S. Patent 7,354,626, **2008**.

Conference Research Presentations (Presented by TM Arruda)

1. 'Understanding the Effects of Sulfate/Bisulfate Ions on Electrolytes for Vanadium/Sulfuric Acid Redox Flow Batteries,' D. J. Donnelly; E. McDonnell; J. S. Lawton and **T. M. Arruda**, *Symposium on Large-Scale Energy Storage 9 (A02)*, # 215, 233rd Meeting of the Electrochemical Society, Seattle, WA, **2018**.

2. 'Electrochemical and Spectroscopic Measurements of Diffusion of Vanadium Species in Ionomer Membranes,' **T.M. Arruda**; D. J. Donnelly and J. S. Lawton, *Symposium on Large-Scale Energy Storage 8 (A02)*, # 190, 231st Meeting of the Electrochemical Society, New Orleans, LA, **2017**.

3. 'Nanoscale Characterization of CDC Supercapacitors by In Situ Scanning Probe Microscopy Methods,' **T. M. Arruda**; M. Heon; V. Presser; Y. Gogotsi and N. Balke, *Symposium on Electrochemical Capacitors (B2)*, # 603, 222th Meeting of the Electrochemical Society, Honolulu, HI, **2012**.

4. 'Electrochemical Strain Spectroscopy: Monitoring Partially Reversible Electrochemical Processes in situ on Li-Air Battery Electrolytes,' **T. M. Arruda**; A. Kumar; S. V. Kalinin and S. Jesse, *Symposium on Metal Air Batteries (B4)*, # 1170, 222th Meeting of the Electrochemical Society, Honolulu, HI, **2012**.

5. 'Partially Reversible Electrochemistry on the Surface of Lithium Ion Conducting Glass Ceramic by Electrochemical Strain Microscopy,' **T. M. Arruda**; A. Kumar; S. Jesse and S. V. Kalinin, *Symposium on Nanotechnology General Session (A4)*, #108, 221st Meeting of the Electrochemical Society, Seattle, WA, **2012**.

6. 'Nanoscale Mapping of Lithium Ion Currents on Lithium Ion Conducting Glass Ceramic by Electrochemical Strain Microscopy,' T.M. Arruda; A. Kumar; S.V. Kalinin and S. Jesse, *Beyond Lithium Ion Symposium IV*, Pacific Northwest National Laboratory, Richland, WA, June 5-7, **2012**.

7. 'Irreversible Conduction of Lithium Ions in Lithium Ion Conducting Glass Ceramic on the Nanoscale by Electrochemical Strain Microscopy,' **T. M. Arruda**; A. Kumar; S. V.

Kalinin and S. Jesse, *Symposium on Electrochemistry on Nanoscale Dimensions 2 (I4)*, # 2524, 220th Meeting of the Electrochemical Society, Boston, MA, **2011**.

8. 'In Situ Investigations into the Interaction of Laccase and Os Mediators for Biological Fuel Cells', **T. M. Arruda**; D. Chakraborty; S. C. Barton and S. Mukerjee, *Symposium on Physical, Analytical and Spectro-Electrochemical Characterization (I1)*, #2759, 214th Meeting of the Electrochemical Society, Honolulu, HI, **2008**

9. 'In Situ XAS Investigation of Novel Osmium-Based Redox Polymer Mediators for Laccase-Based Biological Fuel Cells', **T. M. Arruda**; D. Chakraborty; S. C. Barton and S. Mukerjee, *Symposium on Biological Fuel Cells 3 (B3)*, #249, 213th Meeting of the Electrochemical Society, Phoenix, AZ, **2008**

10. 'The Spontaneous Deposition of Ru Onto Pt/C Electrocatalyst: An In-Situ XAS Study', **T. M. Arruda**; B. Shyam; V. Murthi; D. Ramaker and S. Mukerjee, *Symposium of Fundamentals of Energy Storage and Conversion (B5)*, #312, 213th Meeting of the Electrochemical Society, Phoenix, AZ, **2008**

11. 'In Situ XAS Investigation of Electrocatalyst Poisoning by Halides,' **T. M. Arruda**; J. Ziegelbauer; B. Shyam; D. Ramaker and S. Mukerjee, *Symposium on Proton Exchange Membrane Fuel Cells 7 (B10)*, #443, 212th Meeting of the Electrochemical Society, Washington DC, **2007**

Invited Talks

1. 'Open Access Workshop on Predatory Journals,' McKillop Library, Salve Regina University, October 25th, **2017**

2. 'Alternative Energy in the US, Current Technologies and Future Needs,' *Fall Festival Colloquium Series*, Salve Regina University, October 22nd, **2016**

3. 'Open Access: Benefits and Pitfalls for Peer-Review Publishing, *Open Access Week Panel Discussion*, McKillop Library, Salve Regina University, October 22nd, **2015**'

4. 'Scanning Probe Microscopy Characterization of Electrochemical Energy Materials,' *AFM workshop by Asylum Research and Harvard University*, Harvard University, Cambridge, MA, August 21-22, **2014**

5. 'Probing Irreversible Reactions in Li-air Batteries,' *3rd International Workshop on Nanoscale Imaging for Energy Applications*, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory, Oak Ridge, TN, September 11-13, **2012**

6. 'XAS and EPR Investigations of Laccase as a Potential Electrocatalyst for Biological Fuel Cells', T. Arruda, *National Synchrotron Light Source Seminar*, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY, November, **2008**

SRU Student* Research Presentations:

1. 'Exploring concentration effects on Electrochemical Reversibility, membrane phenomena and crossover of VO_2^+ /VO^{2+} electrolyte solutions for Vanadium Redox Flow Batteries,' **S. Tiano**,* J.S. Lawton and T.M. Arruda, *11th Summer Undergraduate Research Fellowship (SURF) Conference,* University of Rhode Island, July 27th **2018.**

2. 'Porous Lithium Ion Conductive Glass Ceramics for Enhancing Bond Durability, Strength for Protective Lithium Pouches,' **D.J. Donnelly**;* C.J. Patrissi; J. Rizzo; C. Schumacher and T.M. Arruda, *11th Summer Undergraduate Research Fellowship (SURF) Conference*, University of Rhode Island, July 27th **2018.**

3. 'Electrochemical and EPR Measurements of Vanadium Redox Couples for All Vanadium Redox Flow Batteries,' **S. Tiano**,* J. S. Lawton and T. M. Arruda, *Symposium on Larger-Scale Energy Storage 9 (A02)*, # 214, 233rd Meeting of the Electrochemical Society, Seattle, WA, **2018**.

4. 'Investigation of Waste Heat Accumulation and Internal Resistance of AA NiMH Cells,' **D. J. Donnelly,*** C. J. Patrissi and T. M. Arruda, *Symposium on Battery and Energy Technology Joint General Session (A01)*, # 76, 233rd Meeting of the Electrochemical Society, Seattle, WA, **2018**.

5. 'Investigation of Waste Heat Accumulation and Internal Resistance of AA NiMH Cells,' **D. J. Donnelly,*** C. J. Patrissi and T. M. Arruda, *SRYou Day Symposium,* Salve Regina University, Newport, RI, March 21st, **2018**.

6. 'Measurements of Diffusion of Vanadium Species in Electrolyte Solutions,' **S. Tiano**,* J. S. Lawton and T. M. Arruda, *SRYou Day Symposium,* Salve Regina University, Newport, RI, March 21st, **2018**.

7. 'Developing Methods to Quantitate Acid Concentrations in the Presence of VO^{2+},' **E. McDonnell**,* D. J. Donnelly,* T. M. Arruda, *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 19th, **2018.**

8. 'Understanding the Effects of Sulfate/Bisulfate Ions on Electrolytes for Vanadium/Sulfuric Acid Redox Flow Batteries,' **Daniel Donnelly**,* *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 19th, **2018. (Oral Presentation)**

9. 'Electrochemical and EPR Measurements of Vanadium Redox Couples for All Vanadium Redox Flow Batteries,' **S. Tiano**,* J. S. Lawton and T. M. Arruda, *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 19th, **2018.**

10. 'Electrochemical and EPR Measurements of Vanadium Redox Couples for All Vanadium Redox Flow Batteries,' **S. Tiano**,* J. S. Lawton and T. M. Arruda, *Rhode Island NASA Space Grant Consortium Annual Symposium,* April 7th, Rhode Island School of Design, Providence, RI, **2018**.

11. 'Studies on the Interfacial Impedance of Super concentrated Non-Aqueous Electrolytes in Contact With Li-Ion Conductive Ceramic Membranes,' **D. J. Donnelly**,* T. M. Arruda and C. J. Patrissi, Symposium on General Student Poster Session (Z01), #2009, *231st Meeting of the Electrochemical Society*, New Orleans, LA, **2017**.

12. 'Investigation of Waste Heat Accumulation and Internal Resistance of AA NiMH Cells,' **D. Donnelly**,* C.J. Patrissi and T. M. Arruda, *10th Summer Undergraduate Research Fellowship (SURF) Conference*, University of Rhode Island, July 28th **2017.**

13. 'Measurements of Diffusion of Vanadium Species in Electrolyte Solutions,' **S. Tiano**,* J. S. Lawton and T. M. Arruda, *10th Summer Undergraduate Research Fellowship (SURF) Conference*, University of Rhode Island, July 28th **2017.**

14. 'Interfacial Impedance of Super Concentrated Non-Aqueous Electrolyte on Li-ion Conductive Ceramic Membranes,' **D. Donnelly**,* C.J. Patrissi and T. M. Arruda, *Rhode Island NASA Space Grant Consortium Annual Symposium*, Providence College, Providence, RI, April 29th **2017.**

15. 'Proton Exchange Membrane Fuel Cells: Polymer Membranes,' **E. Gendreau**,* S. P. Flanagan,* and T.M. Arruda, *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 11th, **2017**.

16. 'Interfacial Impedance of Super Concentrated Non-Aqueous Electrolyte on Li-ion Conductive Ceramic Membranes,' **D. Donnelly**,* C.J. Patrissi and T.M. Arruda, *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 11th, **2017**.

17. 'Interfacial Impedance of Super Concentrated Non-Aqueous Electrolyte on Li-ion Conductive Ceramic Membranes,' **D. Donnelly**,* C.J. Patrissi and T. M. Arruda, *SRYou Day Symposium,* Salve Regina University, Newport, RI, March 29th **2017**.

18. 'State of Charge Dependence of VO^{2+} Crossover of Nafion for Vanadium Redox Flow Batteries,' **S. P. Flanagan*** and T. M. Arruda, *Rhode Island NASA Space Grant Consortium Annual Symposium*, RI Museum of Natural History at Roger Williams Park, April 30th **2016**.

19. 'State of Charge Dependence of VO^{2+} Crossover of Nafion for Vanadium Redox Flow Batteries,' **S. P. Flanagan*** and T. M. Arruda, *American Chemical Society Rhode Island Section Annual Symposium*, Providence College, Providence, RI, April 19th **2016**.

20. 'State of Charge Dependence of VO^{2+} Crossover of Nafion for Vanadium Redox Flow Batteries,' **S. P. Flanagan*** and T. M. Arruda, *SRYou Day Symposium,* April 1st **2016**.

21. 'Alternative Metal Fuel Cell Catalysts: Driving Clean Energy Automobile Prices Down,' **S. P. Flanagan**,* and T. M. Arruda, *SRYou Day Symposium*, March 20th, **2015**.

22. 'Alternative Metal Fuel Cell Catalysts: Driving Clean Energy Automobile Prices Down,' **S. P. Flanagan**,* and T. M. Arruda, *8th Summer Undergraduate Research Fellowship (SURF) Conference*, University of Rhode Island, July 31st **2015**.