LAMARTINE MEDA
Professor of Inorganic Chemistry and Materials Science
Director: NASA Materials and Interfaces Center for High Energy Storage and Sensing (MICHESSS)

Department of Chemistry
Xavier University of Louisiana
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EDUCATION

2001 NASA Postdoctoral Fellow, College of Engineering (Florida State University-Florida Agricultural and Mechanical University), Tallahassee, FL
Topic: Residual Stress and Strain Measurements in Thin Films Using X-ray Diffraction Methods
Advisor: Professor Hamid Garmestani

1998 Doctor of Philosophy in Inorganic and Materials Chemistry, Northeastern University, Boston, MA *Thesis Title: "Organometallic Chemical Vapor Deposition of Nanocrystalline Metal Oxides Thin Films Prepared from Novel Precursors."*
Advisor: Professor Rein U. Kirss

1992 Bachelor of Science in Chemistry, Salem State University, Salem, MA

PROFESSIONAL POSITIONS

2020-present Director, Materials and Interfaces Center for High Energy Storage and Sensing
2019-present, Professor (Full) of Chemistry, Xavier University of Louisiana, New Orleans
2014-2019, Associate Professor of Chemistry, Xavier University of Louisiana, New Orleans
2012-2014, Assistant Professor of Chemistry GRATIS, University of New Orleans
2016-2020, Director, NASA MIRO Solid High Energy Lithium Battery (SHELiB)
2009-2016, Director, Partnerships for Research and Education in Materials (PREM)
2008-2014, Assistant Professor of Chemistry, Xavier University of Louisiana
2006-2008, Visiting Assistant Professor of Chemistry, Auburn University, Auburn, AL
2006 Visiting Scholar, Georgia Institute of Technology, School of Materials Science Engineering, Atlanta, GA
2002-2006 Senior Research Scientist, Excellatron Solid State, LLC, Atlanta, GA

HONORS, AWARDS, AND FELLOWSHIPS

- Finalist for the Norman C Francis Excellence in Scholarship Award, 2013, 2014, 2015
- Distinguished Alumni Award, Department of Chemistry, Northeastern University, Boston, MA, 2005
- General Electric Minority Foundation Graduate Fellow, Department of Chemistry, Northeastern University, Boston, MA, 1994-1998
- Teaching Assistant, Northeastern University, Boston, MA, 1993-1998
- John D. O'Bryant, Graduate Study Academic Excellence Award, Department of Chemistry, Northeastern University, Boston, MA, 1997
- National Science Foundation-Research Experience for Undergraduate (NSF-REU), Department of Chemistry, Lehigh University, Bethlehem, PA, Summer 1991

SERVICE TO THE UNIVERSITY AND/OR THE COMMUNITY

Service to Xavier University of Louisiana

University-Wide Service:

- University Academic Council, 2020-present
- Tenure and Promotion Appeals Committee, 2020-present
- Graduate University Academic Council, 2018-present
- University Standing Committee-Admissions, 2013-2014, 2017-present
- Ad-hoc Committee to review endowed professorships, 2018
- Director of the National Aeronautics and Space Administration (NASA) MUREP MIRO funded Solid High Energy Lithium Battery (SHELiB) Center, 2015 – present
- Chair, Internal Advisory Committee (IAC) board of the NASA SHELiB, 2015-present
- Chair, External Advisory Committee (EAC) board of the NASA SHELiB, 2015-present
- College of Arts and Sciences Coordinating Committee, 2016-2018
- University Load Committee, 2014-2016
- Director, Partnership for Research and Education in Materials (PREM) program, 2009-2015
- Chair, Internal Advisory Committee (IAC) board of the PREM program, 2009-2015
- Chair, External Advisory Committee (EAC) board of the PREM program, 2009-2015
- Chair, The Executive Committee of the PREM program, 2009-2015

Departmental service:

- Advisor to all Dual Degree Chemistry and Chemical Engineering students 2018-present
- Advisor to all NASA Scholar students, 2015 –present
- Equipment Committee, 2010-2011, 2014-2015, 2016-2018, 2019-present
- Graduate and Professional Development Committee, 2009-2010, 2012-2013, 2016-2018, 2019-present
- Recruitment and Retention Committee, 2009-2019
- Facilities, Space, and Research Committee, 2011- 2012, 2015-2016, 2018-2019
- Curriculum Committee, 2015-2016, 2018-2019
- General Chemistry Ad Hoc Committee, 2014-2015
- Advisor to all PREM students, 2010-2015
- Ad Hoc Committee to Develop a Departmental Integrity Policy, 2014-2015
- Advisor, Phi Lambda Upsilon Faculty, 2010-2011
- Safety Committee, 2008-2010

Scholarly Service

- Co-Chair with Drs. Gleb Yushin and Oleg Borodin “Electrochemical Interfaces” Symposium, ACS DIVISION OF PHYSICAL CHEMISTRY 256th NATIONAL MEETING Boston MA, 19-23 August 2018 Meeting Theme: Nanoscience, Nanotechnology & Beyond
- Chair, National Science Foundation PREM-MRSEC 10th Anniversary, FALL Materials Research Society Meeting, November 30 –December 2, 2014
- Peer-reviewed proposals for the National Science Foundation, 2013- present

- Served as an External Visiting Committee reviewer for the Yale's Center for Research on Interface Structures and Phenomena (CRISP), an NSF Materials Research Science and Engineering Center (MRSEC), 2012
- Peer-reviewed articles for the Journal of Electrochemistry Society, 2012
- Ad-hoc proposal reviewer for the National Science Foundation - CREST proposals, 2012
- Planning Committee Member for the National Science Foundation PREM-MRSEC (Materials Research Science and Education Center) Board of Directors meeting in Puerto Rico, March 2011
- Served as Site Visit Panelist for the National Science Foundation PREM program, 2010
- Served as Panelist for NASA Education proposals, 2010
- Advisory Board Member, External Engagement and Workforce Development (EEWD) Committee for the National Science Foundation-EPSCoR II Grant, Louisiana Board of Regents), 2010-present

Director, Partnerships of Research and Integration in Materials (PREM) (2009-2015)

Since joining Xavier in 2008, my vision has remained the same: to significantly raise the visibility of the ACS program, start a materials research program, and recruit talented undergraduate students. Three new courses (General Chemistry I and II for Chemists and Engineers and Materials Chemistry) were offered by the Department of Chemistry to satisfy the demands of the students in the materials research program.

New Materials Research Program

- Instituted a materials research program
- Recruited over 20 talented students to the ACS program
- Increased in graduation rate and more students have been accepted to graduate schools
- Collaborated with the Admissions office to recruit talented high school students nationwide

Improvement in Scholarly Activity

- Improved research and infrastructure activities have grown and matured at Xavier
- Created a new research culture among the faculty in the program
- Developed interdisciplinary research programs with teams of faculty collaborating in material synthesis, energy storage technologies, and sensor
- Exceeded our expectations in peer-reviewed publications has been increased steadily

SCHOLARSHIP ACCOMPLISHMENTS

Peer-Reviewed Publications/Patents (Undergraduate students are underlined.)

1. Song, A.-Y., Turcheniuk, K., Leisen, J., Xiao, Y., **Meda, L.**, Borodin, O., Yushin. G. Understanding Li-Ion Dynamics in Lithium Hydroxychloride (Li_2OHCl) Solid State Electrolyte via Addressing the Role of Protons, *Adv. Energy Mater.* **2020,** 1903480. https://doi.org/10.1002/aenm.201903480.
2. Gaind P. Pandey, Kobi Jones, **Lamartine Meda**. CNFs/$_{S1-x}Se_x$ Composites as Promising Cathode Materials for High-Energy Lithium-Sulfur Batteries. *MRS Advances*, **2019**, *4 (14)*, 821-828.

3. Yiqun Yang, Jeré A. Williams, Gaind P. Pandey, **Lamartine Meda**. Poly(propylene carbonate) Interpenetrating Cross-Linked Poly(ethylene glycol) Based Polymer Electrolyte for Solid-State Lithium Batteries. *ECS Trans.*, **2018**, *85 (13)*, 53-59.
4. GP Pandey, J Adkins, L. Meda Facile Synthesis of Uniform Carbon Coated Li_2S/rGO cathode for High-Performance Lithium-Sulfur Batteries. *MRS Advances*, **2018**, *3 (60)*, 3501-3506.
5. Ah-Young Song, Yiran Xiao, Kostiantyn Turcheniuk, Punith Upadhya, Anirudh Ramanujapuram, Jim Benson, Alexandre Magasinski, Marco Olguin, **Lamartine Meda**, Oleg Borodin, Gleb Yushin. Protons Enhance Conductivities in Lithium Halide Hydroxide/Lithium Oxyhalide Solid Electrolytes by Forming Rotating Hydroxy Groups. *Adv. Energy Mater.*, **2018**, *8 (3)*, 1700971.
6. GP Pandey, K. Jones, E. Brown, J. Li, **L. Meda**. High Performance Tin-coated Vertically Aligned Carbon Nanofiber Array Anode for Lithium-ion Batteries. *MRS Advances*, **2018**, *3 (60)*, 3519-3524.
7. Y Yang, K. Strong, GP Pandey, L. Meda. Nanostructured V_2O_5/Nitrogen-doped Graphene Hybrids for High Rate Lithium Storage. *MRS Advances*, **2018**, *3 (60)*, 3495-3500.
8. Lacey Douglas, Anantharamulu Navulla and **Lamartine Meda**. Evidence of Extra Capacity in Conversion Reaction of Ruthenium Oxide: A Cyclic Voltammetry Study. *Materials Research Society Proceedings*. **2015**, *1775*, 740.
9. Ayorinde S. Hassan, Anantharamulu Navulla, **Lamartine Meda**, B. Ramu Ramachandran, and Collin D. Wick. Molecular Mechanisms for the Lithiation of Ruthenium Oxide Nanoplates as Lithium-Ion Battery Anode Materials: An Experimentally Motivated Computational Study. *J. Phys. Chem. C*. **2015**, *119*, 9705 − 9713.
10. A. Navulla and **L. Meda**. Direct Growth of RuO_2 Nano-Architectures on Current Collectors and Their Improved Performance in Lithium-Ion Batteries. *ECS Trans*. **2014,** *61(27)*, 131-135.
11. Anantharamulu Navulla, Geoffrey Stevens, Igor Kovalenko, **Lamartine Meda**. Reversible High Capacity in Hierarchical Columnar RuO_2 Nanoplates and Their Improved Performance in Lithium-Ion Batteries*," J. Phys. Chem. C.* **2014**, *118*, 13382−13386.
12. **Lamartine Meda**, Aaron M. Dangerfield, Mila'na C. Jones, Christian M. White, Anantharamulu Navulla. Electrochemical Properties of Tungsten Oxide Nanowires Compared to Bulk Particles. *Jnp. J. Appl. Phys.* **2012,** 51 (11PEO6).
13. **Lamartine Meda** and Eleston E. Maxie. Lipon thin films grown by plasma-enhanced metalorganic chemical vapor deposition in a N_2-H_2-Ar gas mixture, *Thin Solid Films* **2012**, 520, 1799.
14. Ji-Guang Zhang, **Lamartine Meda**, Eleston Maxie. Apparatus for producing thin-film electrolyte. **2005**, Patent number: 6886240.
15. Ji-Guang Zhang, **Lamartine Meda**, Eleston Maxie. System and method of producing thin-film electrolyte. **2005**, Patent number: 6852139.
16. **Lamartine Meda,** Saleh Hayek, Klaus H-Dahmen, Hamid Garmestani. X-ray Diffraction Residual Stress Calculation on Textured $La_{2/3}Sr_{1/3}MnO_3$ thin films. *Journal of Crystal Growth*, **2004,** *263*, 185.
17. **Lamartine Meda**, Richard C. Breitkopf, Terry E. Haas, and Rein U. Kirss. Investigation of Electrochromic Properties of Nanocrystalline Tungsten Oxide Thin-Film," Thin Solid Films, **2002,** *402*, 126.
18. **Lamartine Meda**, LaQuita Kennon, Christiane Bacaltchuck, Klaus H-Dahmen, Hamid Garmestani. The Effects of Thermal Annealing on the Texture of $La_{0.67}Sr_{0.33}MnO_3$ Thin Films. *Journal Materials Research*, **2001**, *16*, 1887.

19. **Lamartine Meda**, C. Bacaltchuck, K.H-Dahmen, H. Garmestani. Residual Strain and Texture in $La_{2/3}Sr_{1/3}MnO_3$. *Journal of Materials Science Materials – Materials in Electronics*, **2001,** *12*, 143.
20. Rein U. Kirss and **Lamartine Meda**. Chemical Vapor Deposition of Tungsten Trioxide. *Applied Organometallic Chemistry*, **1998**, *12*, 155.
21. William M. Reiff, Jozef Kreisz, and **Lamartine Meda**, R. U. Kirss. On the Mixed Valence Behavior and Cooperative 3D Ordering of a Series of Tris-Oxalato Ferrates: Bu4N{M FeIII(ox)3}(M═MnII(A),FeII(B), CoII(C), NiII(D) and 4P{FeIIFeIII(ox)3}(E): New Ferrimagnets. *Molecular Crystal and Liquid Crystal*, **1995**, *273*, 181.

Proceedings

1. *"Synthesis, Characterization and Electrochemical Studies of Bulk and Nano Sized $LiNi_4(PO_4)_3$,"* Anantharamulu Navulla and **Lamartine Meda**, *Prepr. Pap.-Am. Chem. Soc., Div. Energy and Fuels* **2013**, 58(1), 873.
2. *"High Capacity Nickel Oxide Nanomaterials as Anode for Lithium-ion Battery, Corey Arnold, Anantharamulu Navulla,* **Lamartine Meda**, *Prepr. Pap.-Am. Chem. Soc., Div. Energy and Fuels,* **2014**.

Invited Presentations

- *University of Notre Dame*, South Bend, **April 30, 2020 (Postponed dues to Covid 19)**
- *Tulane University*, New Orleans, LA, **November 21, 2019**.
- *Kansas State University*, Manhattan, KS, **November 14, 2019**.
- *Xavier University of Louisiana, 2015 Spring Faculty Colloquium*, **April 7, 2015**, "Challenges in the Development of Rechargeable High Energy Density Lithium Batteries"
- *Louisiana Tech University, Rushton, LA*, **2013**, "High Capacity and Coulombic Efficiency in Ruthenium Oxide"
- *American Chemical Society, Southwest Regional Meeting*, **November 5, 2012**, "High Capacity and Coulombic Efficiency in RuO_2 Nanomaterials."
- *NSF Ceramic Materials Principal Investigator Workshop, National Science Foundation, Washington, DC***, June 19, 2013**, "Direct Growth of Ruthenium Oxide on Stainless Steel Current Collector for Application in Lithium-ion Batteries"

Current Grant (Total $1.6 Million)

- **Agency**: NSF CBET; **Title**: Excellence in Research: Investigation of Interfacial Chemical and Ion Transport in Solid Inorganic-Polymer Electrolytes; **Duration**: 2021 -2024; **Amount**: $513,443; **Role**: PI
- **Agency**: NASA MIRO (renewal); **Title**: Materials and Interfaces Center for High Energy Storage and Sensing; **Duration:** 2020 -2022**; Amount:** $1.6,000,000**; Role:** PI

Post External Grants (Total $8.5 Million)

- **Agency**: NASA; **Title**: Solid High Energy Lithium Battery; **Duration:** 2015 -2020**; Amount:** $5,000,000**; Role:** PI
- **Agency**: The National Science Foundation - Division Of Materials Research; **Title**: NSF-MRI: Acquisition of Integrated Glovebox Vapor Deposition and Spin Coating Systems for Research and Education; **Duration:** 2016 -2019**; Amount:** $198,832; **Role:** PI

- **Agency:** Henry Luce Foundation; **Title:** Clare Boothe Luce Scholarships for Undergraduate Women in Science at Xavier University of Louisiana"; **Duration:** August 2014 – May 2016; **Amount:** $108,000 (direct costs)**; Role:** Co-PI
- **Agency**: The National Science Foundation – Experimental Program to Stimulate Competitive Research (NSF – EPSCoR) program; **Title:** Louisiana Alliance for Simulation Guided Materials Applications (LA-SiGMA); **Duration:** September 2010 – December 2015; **Amount**: $250,000 (direct costs)**; Role:** Senior Research Personnel
- **Agency:** The National Science Foundation - Partnerships for Research and Education in Materials (NSF-PREM) program; **Title:** Nanoscale Imaging Systems; **Duration:** September 1st, 2009 – August 31st, 2015**; Amount:** $3,000,000**; Role**: PI

Post Internal Grants (Total: $101 K)

- **Agency:** The National Science Foundation – Experimental Program to Stimulate Competitive Research (NSF- EPSCoR) program; **Title:** Computational and Experimental Investigations of the Reversible Reactions of Lithium with Nanostructured RuO_2 as Potential Lithium-Ion Battery Anode; **Duration:** July 1, 2011 – June 30, 2013**; Amount:** $34,000; **Role:** Subaward PI
- **Agency:** The National Science Foundation– Model Institution of Excellence (MIE); **Title**: Synthesis and Characterization of Ruthenium and Ruthenium Oxide Nanomaterials, National Science Foundation Model Institution of Excellence; **Duration:** August 18, 2008- July 31, 2009**, Amount:** $59,999**; Role:** Subaward PI
- **Agency:** Xavier University of Louisiana - Center for Undergraduate Research (CUR); **Title:** Chemical Vapor Deposition (CVD) of Lithium Ruthenate; **Duration**: Summer 2009; **Amount:** $7,000; **Role**: Subaward PI

TEACHING ACCOMPLISHMENTS

Lecture Courses Taught:

- **CHEM 4153 - Special Topics -Materials Science and Engineering,** Spring semesters of 2012 (1 section, 21 students), 2013 (1 Section, 17 students)
- **CHEM 4010 – Advanced Inorganic Chemistry II,** Spring semesters of 2014 (1 Section, 5 students) and 2015 (1 Section 1 student);
- **CHEM 4010 – Advanced Inorganic Chemistry I,** Fall semesters of 2013 (1 Section, 11 students) and 2014(1 section 15 students)
- **CHEM 1010 - General Chemistry I Lecture**, Fall semesters of 2009-2011, 2016, 2018-2019 (1 section, 70 students), 2012 (1 Section, 100 students), 2013 (1 Section 79 students), 2014, 2017 (1 Section 80 students), 2015 (1 section 60 students).
- **CHEM 1020 - General Chemistry II Lecture**, Spring semesters of 2010-2012, 2020 (1 section, 70 students)
- **CHEM 1121 – (New lecture course) General Chemistry II Lecture for Chemists and Engineers**, Spring semesters of 2013 (1 section, 7 students), 2016 (1 section 16 students), 2017 (1 section 15 students)

Laboratory:

- **CHEM 1111L (New laboratory course) – General Chemistry Laboratory Lab I**, Fall semester of 2013 (1 Section, 11 students)

- **CHEM 1121L (new laboratory course) - General Chemistry Laboratory II**, Spring semesters of 2012 (1 section, 6 students), and 2013 (1 section, 7 students),
- **CHEM 1011L - General Chemistry Laboratory I**, Fall semesters of 2008 (4 sections, 96 students), 2009 (1 section, 24 students), 2010 (1 section, 24 students), and 2011 (1 section, 24 students), 2016 (4 sections, 96 students), 2017 (2 sections, 48 students); Spring of 2017(1 section, 24 students),
- **CHEM 1021L - General Chemistry Laboratory II,** Spring semesters of 2009 (3 sections, 72 students), 2010 (1 section, 24 students), 2011 (1 section, 24 students), 2015 (1 Section, 24 students), 2017 (3 section, 72 students)

Drill:

- **CHEM 1010D - General Chemistry I Drill,** Fall Semesters of 2009 (1 section, 25 students), 2010 (1 section, 25 students), and 2011 (1 section, 25 students).
- **CHEM 1020D - General Chemistry II Drill,** Spring Semesters of 2010 (1 section, 25 students), and 2011 (1 section, 25 students).
- **CHEM 1021D – (new General Chemistry course) General Chemistry II Drill for Chemists and Engineers),** Spring 2013 (1 section, 7 students)

STUDENT AND POSTDOCS SUPERVISION

Current and former Postdocs and Technician:

1. Dr. Yanmei Jiang (current)
2. Dr. Gaind Pandey (former)
3. Dr. Yuqun Yang (former)
4. Dr. Anantharamula Navulla (former)

Current Undergraduate Research Students

1) Ms. Jere Williams, (Senior, Dual Degree Engineering), December 2020
2) Abiade, Asha (Junior, Chemistry/ACS), *Thesis*: High Capacity MnO as Anode in Lithium-ion Batteries
3) Adams, Jada, (Junior, Chemistry/ACS), *Thesis*: Synthesis of ceramics-polymer Composite electrolyte
4) Asa Green, Freshman, Chemistry ACS Major
5) Ayssia Crockem, Freshman, Dual Degree Chemistry and Chemical Engineering

Former Undergraduate Research Students

- Dr. Aaron Dangerfield, BS Chemistry, Xavier May 2014, **Ph.D**. in Materials Science and Engineering, UT Dallas, 2018
- Dr. Milana Thomas, **Ph.D**. in Materials Science and Engineering, UT Dallas, 2018
- Dr. Jamal Alexander, **Ph.D**. in Physics, Mississippi State University, 2016
- Dr. La'Nese, Lovings, **Ph.D.**, in Inorganic Chemistry, University of Toledo, 2020
- Dr. Cherise Steib, **Dr. of Pharmacy**, College of Pharmacy, Xavier University of New Orleans, 2014
- Dr. Keishondra Sampson, **M.D.**, St. Louis University School of Medicine, 2017
- Dr. Uchena Onwuegbusi, **M.D. and Ph.D**. Howard University School of Medicine, 2016
- Mr. Christian White, **BS** (Chemistry ACS); DuPont, 2013

- Ms. Lydia Mensah, **Ph.D. candidate**, Materials Science, and Engineering, U. Michigan, Expected 2020
- Lacey Douglas, **Ph.D. Candidate**, Inorganic Chemistry, Texas A &M University, Expected 2021
- Mr. Geoffrey Stevens, **Master's Degree**, Mechanical Engineering, University of New Orleans
- Levon Leban, **Master's Degree**, Department of Chemistry, Kansas State University, Expected 2020
- Joshua Adkins, **Graduate Student**, Materials Science and Engineering, Univ. of IL at Chicago, Expected 2023
- Corey Arnold, **Graduate student**, Materials Science and Engineering, Univ. of North Texas
- Kobi Jones, BS Chemistry (Xavier) and Chemical Engineering (Tulane Univ.), May 2020
- Kayla Strong, BS Chemistry (Xavier) and Chemical Engineering (Tulane Univ.), May 2020
- Jere Williams, BS Chemistry (Xavier) and Chemical Engineering (Tulane Univ.), Dec. 2020
- Nam Tran, BS Chemistry (Xavier) and Chemical Engineering (Tulane Univ.), May 2021
- Alexis Day, BS Chemistry, May 2020, (University of California San Diego, Graduate Student, Fall 2020)
- Edelmy Marin Bernadez, BS Chemistry, May 2019, (Stony Brook, Graduate Student Fall 2020)
- Arielle Lebean, Sophomore, Biomedical Engineering, May 2021

MEMBERSHIP

- Member of the American Chemical Society (ACS), 1990-present
- Member of the Electrochemical Society (ECS), 2004-present
- Member of the Materials Research Society (MRS), 2000-present
- Member of the American Ceramic Society (Acers), 2013-present