Lillian Dalila Mathews

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EDUCATION

Ph.D., Physical Chemistry (2010), University of Georgia, Athens, GA

- Dissertation: Ion-Molecule Reaction Kinetics of a Series of 5-Membered and 6-Membered Cyclic Molecules: Significance to the Interstellar Medium and Titan's Atmosphere

B.S., Chemistry (2004), University of Montevallo College of Arts and Sciences, Montevallo, Al

- Undergraduate Thesis: Synthesis and Purifications of Organometallic Porphyrins

EXPERIENCE

Associate Professor of Chemistry (2018-Present)

University of Montevallo, Montevallo, AL

- Teach the following courses
  - CHEM 100: Fundamentals of Chemistry (Traditional and Online)
  - CHEM 121: General Chemistry I
  - CHEM 321: Physical Chemistry I-Thermodynamics and Kinetic
  - CHEM 491: Chemistry Seminar (Senior Capstone)
  - CHEM 440: Special Topics-Environmental Chemistry
  - CHEM 122: General Chemistry II
  - CHEM 322: Physical Chemistry II: Quantum Theory and Spectroscopy
- Advise approximately 10 chemistry majors
- Perform research related to the construction and use of dye-sensitized solar cells

Assistant Professor of Chemistry (2012-2018)

University of Montevallo, Montevallo, AL

NSF RET Program (Summer 2017)

University of Alabama, Tuscaloosa, AL

- Synthesis of conductive polymer for use in dye-sensitized solar cells

Postdoctoral Research Fellow (2011-2012)

University of Georgia, Athens, GA

- Photoacoustic spectroscopy of aerosol particles in Earth's atmosphere
- Laboratory Techniques: Photoacoustic spectroscopy, phase shift cavity ring down, mercury arc lamp, optical alignment, focusing, and collimating techniques, LabView

NSF REU Program (Summer 2003)

University of Alabama, Tuscaloosa, AL

- Laser flash photolysis of porphyrins

PUBLICATIONS

1. **L. Dalila Mathews**, Heat Capacity of a Thermally Insulated Cup: Connecting Students to Science. Chem. Educ. Chem. Educator 23 (2018) 16–20
2. **L. Dalila Mathews**, Cynthia P. Tidwell, Prakash Bharara, Glenn Stephens, Ting Yu Su and Alexia Carter, "Copper 5,10,15,20-Tetrakis-(3,4-dibenzyloxyphenyl)porphyrin" *Molbank* 1 (2017), M931
3. Joseph R. Wiegand, L. Dalila Mathews, and Geoffrey D. Smith., "A UV–Vis Photoacoustic Spectrophotometer" *Analytical Chemistry* 86 (2014) 12, 6049-6056
4. **Mathews, L.D.**, Adams, N.G., "Ion Chemistry of $C_3H_3^+$ With Several Cyclic Molecules." *International Journal of Mass Spectrometry* 299 (2011): 139-144.
5. Adams, N.G., Fondren, L.D., "Laboratory Chemistry Relevant to Understanding and Modeling the Ionosphere of Titan." *Faraday Discussions* 147 (2010): 1-13.
6. **Fondren, L.D**, Adams, N.G., Stavish, L., "Gas Phase Reactions of CH_3^+ with a Series of Homo- and Heterocyclic Molecules." *Journal of Physical Chemistry A* 113 (2009): 592-598
7. Stavish, L., Fondren, L.D., Adams, N., "Reactions of N^+ and N_2^+ with Several Cyclic Molecules Obtained Using a Selected Ion Flow Tube." *International Journal of Mass Spectrometry* 281 (2009): 103-107
8. **Fondren, L. Dalila**, McLain, Jason, Jackson, Douglas M., Adams, Nigel G., Babcock, Lucia M. "Studies of Reactions of a Series of Ions with Nitrogen Containing Heterocyclic Molecules Using a Selected Ion Flow Tube." *International Journal of Mass Spectrometry* 265 (2007): 60-67
9. Tidwell, Cynthia P., Bharara, Prakash, Rudeseal, Gretchen, Rudeseal, Tiffany, Rudeseal, Frank H., Jr., Simmer, Christine A., McMillan, Dugald, Lanier, Katherine, Fondren, L. Dalila, Folmar, LaTasha L., Belmore, Ken. "Synthesis and Characterization of 5,10,15,20-Tetra[3-[(3-trifluoromethyl) phenoxy] phenyl] porphyrin." *Molecules* 12 (2007): 1389-1398
10. Tidwell, C. P., Alexander, L. A., Fondren, L. D., Belmore, K.; Nikles, D. E. "Synthesis and Characterization of 5,10,15,20-Tetra(N-ethyl-3-carbazoyl) porphyrin." *Indian Journal of Chemistry, Section B: Organic Chemistry Including Medicinal Chemistry* 46B (2007): 1658-1665.
11. N. G. Adams, L. D. Fondren, J. L. McLain, D. M. Jackson. "Laboratory Studies of Stabilities of Heterocyclic Aromatic Molecules: Suggested Gas Phase Ion-Molecule Routes to Production in Interstellar Gas Clouds." *Proceedings of the NASA Laboratory Astrophysics Workshop*, (2006): 136-139.
12. Jackson, Douglas M., Stibrich, Nathan J., McLain, Jason L., Fondren, Lillian D., Adams, Nigel G., Babcock, Lucia M. "A Selected Ion Flow Tube Study of the Reactions of Various Nitrogen Containing Ions with Formic Acid, Acetic Acid, and Methyl Formate." *International Journal of Mass Spectrometry* 247 (2005): 55-60.
13. **Fondren, L.Dalila**, Bakker, Martin, Tidwell, Cindy "Laser Flash Photolysis Studies of Zinc 5, 10, 15, 20-Tetra(9-ethyl-3-carbazoyl) Porphyrin." *Proceedings of the National Conference of Undergraduate Research* (2004)

PRESENTATIONS

1. Alex Weldon, L. Dalila Mathews, "Synthesis and Electrochemical Characterization of P3HT for use in Solar Energy Conversion." Oral presentation given as part of the 2019 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2019.
2. Brian Kirkwood, L. Dalila Mathews, "Various metalations of 5,10,15,20- Tetrakis(4-carboxyphenyl)porphyrin." Oral presentation given as part of the 2018 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2017. (Won 1st place in oral session)
3. Hunter Taylor, Dalila Mathews, "The pH Dependence of Anthocyanin Dye Sensitized Solar Cells- An Undergraduate Physical Chemistry Law." Poster presented at Undergraduate Research Day at the University of Montevallo, Montevallo ,AL, March 2018.
4. Jordan Wilson, Alexander Weldon, Dalila Mathews, "Synthesis and Characterization of Poly(3-hexylthiophene) for use in Solar Energy Conversion." Poster presented at Undergraduate Research Day at the University of Montevallo, Montevallo ,AL, March 2018.
5. Jordan Wilson, L. Dalila Mathews, "Effect of hydroxylation on anthocyanin-based dye sensitized solar cells." Poster presented as part of the 2017 Nation Council on Undergraduate Research at the University of Memphis, Memphis, TN April 2017.
6. Brian Kirkwood, L. Dalila Mathews, "The metalation and characterization of tetrakis(4-carboxyphenyl)porphyrin." Poster presented as part of the 2017 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2017.
7. Jordan Wilson, L. Dalila Mathews, "Effect of hydroxylation on anthocyanin-based dye sensitized solar cells." Oral presentation presented as part of the 2017 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2017.
8. Brian Kirkwood, L. Dalila Mathews, "Effects of Varying the Application Method of TiO2 on the Efficiency of Dye Sensitized Solar Cells." Poster presented as part of the 2017 Higher Education Day: Posters at the Capitol Montgomery, AL February 2017.
9. Jordan Wilson, Brian Kirkwood, Bryant Thurman, Dalila Mathews, "Effect of hydroxylation on anthocyanin-based dye sensitized solar cells." Poster presented at the Emory STEM Research and Career Symposium Atlanta, GA September 2016
10. Jordan Wilson, Brian Kirkwood, Bryant Thurman, Dalila Mathews, "Effect of hydroxylation on anthocyanin-based dye sensitized solar cells." Oral presentation at the UMBC McNair Conference, Baltimore, MD September 2016.
11. Dalila Mathews, Glenn Stephens, Cindy Tidwell, Prakash Bharara "Synthesis and Characterization of Copper 5, 10, 15, 20- tetra[3,4-dibenzyloxy]porphyrin." Poster presented at the 68th Southeastern Meeting of the ACS, Columbia, SC October 2016.
12. Jordan Wilson, Brian Kirkwood, Bryant Thurman, Dalila Mathews, "Effect of hydroxylation on anthocyanin-based dye sensitized solar cells." Poster presented at the 68th Southeastern Meeting of the ACS, Columbia, SC October 2016.
13. Brian Kirkwood, L. Dalila Mathews, "Effects of Varying the Application Method of TiO2 on the Efficiency of Dye Sensitized Solar Cells." Poster presented as part of the 2016 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2016.
14. Glenn Williams, L. Dalila Mathews, C. Tidwell, P. Bharara, "The Synthesis and Characterization of Copper 5,10,15,20-Tetrakis-(3,4-dibenzyloxyphenyl) Porphyrin ."

Poster presented as part of the 2016 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2016.

15. Jordan Wilson, Bryant Thurman, Brian Kirkwood, Hunter Taylor, L. Dalila Mathews, "The Effect of Hydroxylation on Anthocyanins in the Efficiency of DSSC." Poster presented as part of the 2016 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2016.
16. Bryant Thurman, L. Dalila Mathews, "Dye Sensitized Solar Cell Lab." Oral presentation presented as part of the 2016 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2016.
17. Dalila Mathews, "Dye Sensitized Solar Cells: Artificial Photosythesis." Oral presentation given as part of the 7th Annual Faculty Research Symposium, March 2016.
18. Steven Sartor, Glenn Williams, Dalila Mathews, "The Effect of pH on the Efficiency of Anthocyanin Dye Sensitized Solar Cells." Poster presented at Undergraduate Research Day at the University of Montevallo, Montevallo,AL, March 2015.
19. Alexia Carter, Cindy Tidwell, Dalila Mathews, Prakash Bharara, "Copper Porphyrin." Poster presented at Undergraduate Research Day at the University of Montevallo, Montevallo,AL, March 2015.
20. Eileen Larsen, Cindy Tidwell, Dalila Mathews, Prakash Bharara, Brian Motii, "Making Lab Green- Reducing Waste, Pollution, and Expense in Undergraduate Organic Chemistry Laboratories with the Microwave Chemistry Technique." Poster presented at Undergraduate Research Day at the University of Montevallo, Montevallo,AL, March 2015.
21. Steven Sartor, Glenn Williams, Dalila Mathews, "The Effect of pH on the Efficiency of Anthocyanin Dye Sensitized Solar Cells." Poster presented at the 66th Southeastern Meeting of the ACS, Nashville, TN, October 2014.
22. Prakash Bharara, Cindy Tidwell, Dalila Mathews, et. al., "Synthesis and Spectroscopic Investigations of 5, 10, 15, 20- tetra tetra[3,4-dibenzyloxy]porphyrin and some of its Metal Complexes." Poster presented at the 66th Southeastern Meeting of the ACS, Nashville, TN, October 2014.
23. Glenn Stephens, Hunter Staggs, Joe Handley, L. Dalila Mathews, "Dye Sensitized Solar Cells: Fabrication, Characterization and Optimization." Poster presented as part of the 2014 University of Montevallo Undergraduate Research Day, Montevallo, AL March 2014.
24. Mathews, L.D., Adams, N.G. "Gas Phase Ion-Neutral Reactions Relevant to the Formation of PAH and PANH Molecules in the Atmosphere of Titan." Poster presented as part of the Graduate Students and Post-docs in Science 2nd Annual Scientific Research Day, Athens, GA, June 2010.
25. Fondren, L.D., Adams, N.G. "Gas Phase Reactions of CH_3^+ with Cyclic Molecules." Poster presented as part of the Advancing Chemical Understanding Through Astronomical Observations conference, Green Bank, WV, May 2009.
26. Fondren, L.D., Adams, N.G. "Gas Phase Reactions of CH_3^+ with a Series of Homo- and Heterocyclic Molecules." Oral presentation at the 60th Southeastern Meeting of the ACS, Nashville, TN, November 2008.
27. Fondren, L.D., Adams, N.G. "Selected Ion Flow Tube Study of Reactions of Heterocyclic Compounds with a Series of Ions: Astrochemical Significance." Poster

presented as part of the 231st ACS Nation Meeting: Molecules in Space Special Session, Atlanta, GA, May 2006.

28. Fondren, L.D., Tidwell, C.P., Bakker, M. "Laser Flash Photolysis Studies of Zinc 5,10,15, 20 Tetra (9-ethyl-3-Carbazoyl) Porphyrin." Poster presented as part of the Nation Conference on Undergraduate Research, Indianapolis, IN, April 2004.
29. Fondren, L.D., Tidwell, C.P., Bakker, M. "Laser Flash Photolysis Studies of Zinc 5,10,15, 20 Tetra (9-ethyl-3-Carbazoyl) Porphyrin." Oral presentation at the 55th Southeastern Meeting of the ACS, Atlanta, GA, November 2003.

Awards and Honors

1. Course Development Grant (2018), "Using Doceri to Create Online Tutorials for General Chemistry I," $2,000, University of Montevallo
2. Summer Research Experience for College Teachers (2017), "Synthesis and Characterization of Poly(3-hexylthiophene) for use in Solar Energy Conversion," $5,000, University of Alabama
3. Pre-Tenured Faculty Summer Research Stipend (2015) "Artificial Photosynthesis: Dye Sensitized Solar Cells," $5,000, University of Montevallo
4. Green Fund Grant, (2014) "Artificial Photosynthesis: Fabrication and Characterization of Dye Sensitized Solar Cells," $500, University of Montevallo
5. Faculty Development Committee Grant (2014) "An Epidemiological Study of the Impact of Aerosol Particles on the Respiratory Health of the Shelby County Population," $2,ooo, University of Montevallo
6. University of Montevallo Foundation Grant (2014) "Characterization of Dye Sensitized Solar Cells Using an Abet Low-Cost Solar Illuminator," $5,000, University of Montevallo.

SERVICE

Committee Service:

1. Search Committee for Director of McNair Scholar Program (2017)
2. Faculty Senator (2015-2018), 2022-present)
    a. Academic Policy Committee (2015-2016)
    b. SGA Liaison (2016-2017)
    c. Technology Advisory Committee Liaison (TAC) Member (2017-2018)
    d. TAC Social Media Policy Subcommittee (2017-2018)
    e. TAC Faculty Subcommittee (2017-2018)
3. University Conduct Council (2014-2017, 2021-2022)
4. Concert and Lecture Committee (2014-2018)
5. Library Liaison for Chemistry Faculty (2012-present)
6. General Education Assessment Committee: Chemistry (2012-2022)
7. Search Committee for associate professor of chemistry (2022)

Other Service to the Department, University, and Profession:

1. UM fall preview day (2022)

2. External Program Reviewer for the Chemistry Department at Georgia Southwestern State University (2022)
3. Session Moderator, Undergraduate Research Day (2018,2019)
4. Faculty advisor (2016-2020) and co-advisor (2013-2015) for the UM Chemistry Club
5. UM Summer Preview Day (2017)
6. Women in STEM Teen Conference UM Recruitment event (2017)
7. Interviewer, MHS Mock Interviews (2016, 2017)
8. Interviewer, Teacher's Education Program LIA Presentation (2014)
9. Faculty Moderator, UM Welcome Weekend (2014, 2016)
10. Faculty Mentor, McNair Scholar Program (four students: 2014, 2015-2016, 2015-2018, 2018)
11. Montevallo High School Future Falcons Day (2014, 2017)
12. Run for Research Fundraiser (2013, 2014, 2017)
13. Judge, Alabama Junior Academy of Sciences Presentations (2013-present)
14. Lab and Chemical Safety Officer (2012-present)

Community Involvement:

1. Shelby County Water Festival Volunteer (2021)
2. Chemistry Demonstrations, Meadowview Elementary School 2nd Grade (2019, 2020)
3. Faculty Mentor, Montevallo High School Science Faculty (2013-2014)