

Curriculum Vitae

Lillian Dalila Mathews, Ph.D.

(205) 665-6478 • Mathews1@Montevallo.edu

Education

2004-2010 University of Georgia Athens, GA

Ph.D., Physical Chemistry

- ◆ Research Advisor: Nigel G. Adams
- ◆ Dissertation Title: Ion-Molecule Reaction Kinetics of a Series of 5-Membered and 6-Membered Cyclic Molecules: Significance to the Interstellar Medium and Titan's Atmosphere
- ◆ 2009-2010 ACS Outstanding Graduate Student of the Year

2001-2004 University of Montevallo Montevallo, AL

BS, Chemistry

- ◆ Advisor: Cynthia Tidwell
- ◆ Undergraduate Research: Synthesis and Purifications of Organometallic Porphyrins

1999-2001 Shelton State Community College Tuscaloosa, AL

AS, General Studies

Teaching Experience

2012-Present University of Montevallo Montevallo, AL

- ◆ General Chemistry I General Chemistry II
- ◆ Physical Chemistry I Physical Chemistry II
- ◆ Senior Seminar I Senior Seminar II
- ◆ Fundamentals of General Chemistry

2004-2010 University of Georgia Athens, GA

- ◆ Served as both a departmental and private tutor for chemistry undergraduate students

Fall 2010 Science Guyz Athens, GA

- ◆ Employed as a physics and chemistry tutor at a private tutoring company
- ◆ One-on-one tutoring
- ◆ Group reviews

Fall 2004 University of Georgia Athens, GA

- ◆ Teaching assistant in the General Chemistry Laboratory
- ◆ Full responsibility for three lab sections
- ◆ Awarded the Ken Whitten Outstanding TA award for exceptional student reviews

Research Experience

May 2011-June 2012 University of Georgia Athens, GA

- ◆ Postdoctoral Research Assistant in the Smith Group of Aerosolomics

- ◆ Investigating the chemistry of aerosol particles important in Earth's atmosphere.
- ◆ Laboratory Techniques
 - ▲ Photoacoustic Spectroscopy
 - ▲ Phase Shift Cavity Ring Down
 - ▲ Mercury Arc Lamp
 - ▲ Optical alignment, focusing, and collimating techniques
 - ▲ LabView

2004-2010 University of Georgia Athens, GA

- ◆ Research Assistant in the Gas Phase Ion Chemistry Laboratory
- ◆ Researched various chemical reaction of importance in the interstellar medium and in the atmosphere of Titan.
- ◆ Laboratory Techniques
 - ▲ Quadrupole Mass Spectrometer
 - ▲ Vacuum Systems
 - ▲ Analog/Digital Electronics
 - ▲ Ion Counting
 - ▲ Control and flow of toxic and flammable gases
 - ▲ Chemical Preparation

Summer 2003 University of Alabama Tuscaloosa, AL

- ◆ Participant in the Summer Undergraduate Research Program
- ◆ Investigated light induced chemical processes in organometallic porphyrins using laser flash photolysis.
- ◆ Laboratory Techniques
 - ▲ UV-Vis Spectrometer
 - ▲ Spectrofluorimeter
 - ▲ Solid State Laser (Nd:YAG)

2001-2004 University of Montevallo Montevallo, AL

- ◆ Participated in undergraduate research where I learned the basic principles behind proper laboratory procedure and how to synthesis and purify a variety of porphyrins.
- ◆ Laboratory Techniques
 - ▲ Synthesis and purification of porphyrins
 - ▲ Column chromatography
 - ▲ Distillation

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 Lab." 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 Photosynthesis." 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-dibenzoyloxy]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.

Grant Proposals

1. October 2015

Artificial Photosynthesis: Dye Sensitized Solar Cells submitted to the Faculty Development Committee. \$5,000 Funded

2. October 2014
Artificial Photosynthesis: Fabrication and Characterization of Dye Sensitized Solar Cells
submitted to the Green Fund: Special Projects. \$500 Funded
3. September 2014
An Epidemiological Study of the Impact of Aerosol Particles on the Respiratory Health of the Shelby County Population submitted to the Faculty Development Committee.
\$2,000 Funded
4. May 2014
Characterization of Dye Sensitized Solar Cells Using an Abet Low-Cost Solar Illuminator
submitted to the UM Foundation. \$5,000 Funded