

Robert W. Lamb, PhD

Department of Chemistry, Mississippi State University, Mississippi State, MS 39762

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Experience

Mississippi State University

Assistant Teaching Professor	2025 - present
Instructor/Lab Coordinator	2023 - 2025
Research Assistant	2016 - 2020
Teaching Assistant	2014 - 2020

Engineer Research and Development Center

ORISE Postdoctoral Fellow	2020 - 2023
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University of North Carolina at Pembroke

Academic Tutor (Chemistry and Physics)	2012 - 2014
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Education

ORISE Postdoctoral Fellowship

Engineer Research and Development Center (ERDC) Advisor: Manoj Shukla	2020 - 2023
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Ph.D., Chemistry

Mississippi State University Advisor: Charles Edwin Webster	2014 - 2020
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B.S., Chemistry: Focus in Pre-Health Sciences

University of North Carolina at Pembroke Advisor: Paul Flowers	2010 - 2014
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Awards

ORISE Postdoctoral Fellowship	2020 - 2023
ChemDawg Quarterly - Fall 2019: Featured Graduate Student	2019
MSU Department of Chemistry Outstanding Researcher Award	2019
Presentation at Lester Andrews Graduate Research Symposium	2019
Presentation at Lester Andrews Graduate Research Symposium	2018
UNCP RISE Fellowship	2013 - 2014

Professional Memberships

American Chemical Society	
Division of Inorganic Chemistry	2015 - present
Division of Computers in Chemistry	2015 - present

Grants and Funding Received

ORISE Postdoctoral Fellowship	2020 – 2023
MSU College of Arts and Sciences Graduate Student Travel Support	2018
U.S. Dept. of Education Graduate Assistance in Areas of National Need	2015
UNCP RISE Fellowship	2013 – 2014

Skills

- Experienced in administering both undergraduate and graduate level chemistry courses, with expertise in lecturing, exam-writing, and laboratory development.
- Guided graduate teaching assistants in creating course materials that focus on clear goals and effective communication for undergraduate audiences.
 - Building skills in adapting complex scientific concepts for varied audiences is valuable for both academic and professional chemistry roles.
- Experience working on collaborative research projects between multiple institutions, fostering effective communication and teamwork.
- Proficient in instructing students to be capable of conducting independent research, guiding them through experimental design, data collection, and analysis.
- Experienced in system administration, managing lab workstations (Windows) and computational servers (Linux) with proficiency in system optimization and maintenance.
- Experienced in developing automated data analysis tools and scripts, streamlining data processing and analysis workflows.
 - To this end, proficient in scripting using bash and Python

Book Chapters

1. Shukla, M.K. *et al.* (2024). Emerging Materials and Environment: A Brief Introduction. In: Shukla, M., Ferguson, E., Leszczynski, J. (eds) Emerging Materials and Environment. Challenges and Advances in Computational Chemistry and Physics, vol 37. Springer, Cham. DOI: [10.1007/978-3-031-39470-6_1](https://doi.org/10.1007/978-3-031-39470-6_1)

Peer-Reviewed Publications

16. Mensah, J.; Adiraju, V. K.; Cope, J. D.; Lamb, R. W.; Li, X. X.; Donnadieu, B.; Rubtsov, I. V.; Webster, C. E.; Hollis, T. K. Ligand Reorganization in the Coordination Sphere of a CCC-NHC Pincer Fe Complex and Transient Absorption Spectroscopic Characterization of $[(^{13}\text{C}^i\text{C}^i\text{C}^{\text{Bu}})_2\text{Fe}]$. *Organometallics*, **2024**, *43*, 273-283. DOI: [10.1021/acs.organomet.3c00386](https://doi.org/10.1021/acs.organomet.3c00386)
15. Das, S.; Nugegoda, D.; Yao, W.; Figgins, M. T.; Lamb, R. W.; Webster, C. E.; Delcamp, J. H.; Papish, E. T. Sensitized and Self-Sensitized Photocatalytic Carbon Dioxide Reduction Under Visible Light with Ruthenium Catalysts Shows Enhancements with More Conjugated Pincer Ligands. *Euro J Inorg Chem*, **2022**, *2022*, e202101016. DOI: [10.1002/ejic.202101016](https://doi.org/10.1002/ejic.202101016)
14. **Outside Front Cover:** Lamb, R. W.; McAlexander, H.; Woodley, C. M.; Shukla, M. K.; Towards a comprehensive understanding of malathion degradation: comparison of degradation reactions under alkaline and radical conditions. *Environ. Sci.: Processes Impacts*. **2022**, *24*, 1026-1036. DOI: [10.1039/D2EM00050D](https://doi.org/10.1039/D2EM00050D)

13. Oladipupo, O.E.; Brown, S.R.; Lamb, R.W.; Gray, J.L.; Cameron, C.G.; DeRegnaucourt, A.R.; Ward, N.A.; Hall, J.F.; Xu, Y.; Petersen, C.M.; Qu, F.; Shrestha, A.B.; Thompson, M.K.; Bonizzoni, M.; Webster, C.E.; McFarland, S.A.; Kim, Y.; and Papish, E.T., Light-responsive and Protic Ruthenium Compounds Bearing Bathophenanthroline and Dihydroxybipyridine Ligands Achieve Nanomolar Toxicity towards Breast Cancer Cells. *Photochem Photobiol*, **2022**, *98*, 102-116. DOI [10.1111/php.13508](https://doi.org/10.1111/php.13508)
12. Lamb, R. W.; McAlexander, H.; Woodley, C. M.; Shukla, M. K., Towards a comprehensive understanding of malathion degradation: theoretical investigation of degradation pathways and related kinetics under alkaline conditions. *Environ. Sci.: Processes Impacts*. **2021**, *23*, 1231. DOI [10.1039/d1em00181g](https://doi.org/10.1039/d1em00181g)
11. Qu, F.; Lamb, R. W.; Cameron, C. G.; Park, S.; Oladipupo, O.; Gray, J. L.; Xu, Y.; Cole, H. D.; Bonizzoni, M.; Kim, Y.; McFarland, S. A.; Webster, C. E.; Papish, E. T., Singlet Oxygen Formation vs Photodissociation for Light-Responsive Protic Ruthenium Anticancer Compounds: The Oxygenated Substituent Determines Which Pathway Dominates. *Inorg. Chem.* **2021**, *60*, 2138-2148. DOI [10.1021/acs.inorgchem.0c02027](https://doi.org/10.1021/acs.inorgchem.0c02027)
10. Lamb, R. W.; Schrock, A. K.; Huggins, M. T.; Webster, C. E., Predicting Absorption and Emission Maxima of Polycyclic Aromatic Azaborines: Reliable Transition Energies and Character. *The Journal of Physical Chemistry A* **2021**, *125*, 3-12. DOI [10.1021/acs.jpca.0c05765](https://doi.org/10.1021/acs.jpca.0c05765)
9. Das, S.; Nugegoda, D.; Qu, F.; Boudreaux, C. M.; Burrow, P. E.; Figgins, M. T.; Lamb, R. W.; Webster, C. E.; Delcamp, J. H.; Papish, E. T., Structure Function Relationships in Ruthenium Carbon Dioxide Reduction Catalysts with CNC Pincers Containing Donor Groups. *Eur. J. Inorg. Chem.* **2020**, *2020*, 2709-2717. DOI [10.1002/ejic.202000444](https://doi.org/10.1002/ejic.202000444)
8. Shirley, H.; Figgins, M. T.; Boudreaux, C. M.; Liyanage, N. P.; Lamb, R. W.; Webster, C. E.; Papish, E. T.; Delcamp, J. H., Impact of the Dissolved Anion on the Electrocatalytic Reduction of CO₂ to CO with Ruthenium CNC Pincer Complexes. *ChemCatChem* **2020**, *12*, 4879-4885. DOI [10.1002/cctc.202000742](https://doi.org/10.1002/cctc.202000742)
7. Das, S.; Rodrigues, R. R.; Lamb, R. W.; Qu, F.; Reinheimer, E.; Boudreaux, C. M.; Webster, C. E.; Delcamp, J. H.; and Papish, E. T., Highly Active Ruthenium CNC Pincer Photocatalysts for Visible-Light-Driven Carbon Dioxide Reduction, *Inorg. Chem.*, **2019**, *58*, 8012-8020. DOI: [10.1021/acs.inorgchem.9b00791](https://doi.org/10.1021/acs.inorgchem.9b00791)
6. Kosgei, G. K.; Breen, D. J.; Lamb, R. W.; Livshits, M. Y., Crandall; L. A., Ziegler C. J.; Webster, C. E.; and Rack, J. J., Controlling Photoisomerization Reactivity Through Single Functional Group Substitutions in Ruthenium Phosphine Sulfoxide Complexes, *J. Am. Chem. Soc.*, **2018**, *140*, 9819-9822. DOI: [10.1021/jacs.8b05957](https://doi.org/10.1021/jacs.8b05957)
5. Huckaba, A. J.; Shirley, H.; Lamb, R. W.; Guertin, S.; Autry, S.; Cheema, H.; Talukdar, K.; Jones, T.; Jurss, J. W.; Dass, A.; Hammer, N. I.; Schmehl, R. H.; Webster, C. E.; and Delcamp, J. H., A Mononuclear Tungsten Photocatalyst for H₂ Production, *ACS Catalysis*, **2018**, *8*, 4838-4847. DOI: [10.1021/acscatal.7b04242](https://doi.org/10.1021/acscatal.7b04242)
4. Denny, J. A.; Lamb, R. W.; Reilly, S. W.; Donnadiou, B.; Webster, C. E.; and Hollis, T. K., Investigation of metallation/transmetallation reactions to synthesize a series of CCC-NHC Co pincer complexes and their X-ray structures, *Polyhedron*, **2018**, *151*, 568-574. DOI: [10.1016/j.poly.2018.05.040](https://doi.org/10.1016/j.poly.2018.05.040)
3. Burks, D. B.; Davis, S.; Lamb, R. W.; Liu, X.; Rodrigues, R.; Liyanage, N. P.; Sun, Y.; Webster, C. E.; Delcamp, J.; and Papish, E. T., Nickel(II) pincer complexes demonstrate that the remote substituent controls catalytic carbon dioxide reduction, *Chem. Commun.*, **2018**, *54*, 3819-3822. DOI: [10.1039/C7CC09507D](https://doi.org/10.1039/C7CC09507D)
2. Saint-Louis, C. J.; Shavnore, R. N.; McClinton, C. D. C.; Wilson, J. A.; Magill, L. L.; Brown, B. M.; Lamb, R. W.; Webster, C. E.; Schrock, A. K.; and Huggins, M. T., Synthesis, computational, and spectroscopic analysis of tunable highly fluorescent BN-1,2-azaborine derivatives containing the N-BOH moiety, *Org. & Biomol. Chem.*, **2017**, *15*, 10172-10183. DOI: [10.1039/C7OB02415K](https://doi.org/10.1039/C7OB02415K)

1. Cope, J. D.; Denny, J. A.; Lamb, R. W.; McNamara, L. E.; Hammer, N. I.; Webster, C. E.; and Hollis, T. K., Synthesis, characterization, photophysics, and a ligand rearrangement of CCC-NHC pincer nickel complexes: Colors, polymorphs, emission, and Raman spectra, *J. Organomet. Chem.*, **2017**, *845*, 258-265. DOI: [10.1016/j.jorganchem.2017.05.046](https://doi.org/10.1016/j.jorganchem.2017.05.046)

Invited Presentations

- R. W. Lamb, C.E. Webster, "Building Better Catalysts from Systematic Experimental and Computational Studies," Feeding and Powering the World 2019: The Next Generation, July 15-16, 2019, Oxford, MS.
- R. W. Lamb, C.E. Webster, "Insights into the Mechanism of HER Catalyzed by (py-NHC-*p*-CF₃-Ph)W(CO)₄," Oct. 4, 2018, Mississippi State Center for Computational Sciences Meeting, Starkville, MS.
- R. W. Lamb, C.E. Webster, "Update from the Webster Group" Feeding and Powering the World 2018: Planning for the Future, July 16-17, 2018, Oxford, MS.
- R. W. Lamb, "Using Theory to Understand and Guide Experiment" Invited Lecture, Nov. 6, 2017, UNC Pembroke, Pembroke, NC.
- R. W. Lamb, C.E. Webster, "New Insights into the Mechanism of HER Catalyzed by (py-NHC-*p*-CF₃-Ph)W(CO)₄," Feeding and Powering the World 2017: Building the Knowledge Base, June 19-20, 2017, Oxford, MS.

Contributed Presentations

- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Toxic Industrial Chemicals and Materials – Data Availability, Prediction, and Assessment," ACS National Meeting, Indianapolis, IN, Mar 26-30, 2023
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Using Chemical Identifiers to Predict Environmentally Relevant Properties of Poly- and Perfluorinated Compounds," ACS National Meeting, Indianapolis, IN, Mar 26-30, 2023
- R. W. Lamb, H. R. McAlexander, G. Jenness, M. K. Shukla, "Chemical Identifiers and NLP for UV-Vis Spectra Prediction," ACS National Meetings, Chicago, IL, Aug 21-25, 2022
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "High-Throughput Approaches for PFAS: Generating fast, reliable data for ML Investigations," ACS National Meeting, San Diego, CA & Virtual, March 20-24, 2022
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Towards a Comprehensive Understanding of Malathion Degradation: Comparison of Degradation Reactions under Alkaline and Radical Conditions," RD22, Vicksburg, MS, April 26-28, 2022
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Prediction environmentally relevant properties using DFT and ML techniques," RD22, Vicksburg, MS, April 26-28, 2022
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Towards a Comprehensive Understanding of Malathion Degradation: Computational Examination of Degradation Pathways and Related Kinetics," ACS National Meeting, April 5-16, 2021
- R. W. Lamb, H. R. McAlexander, M. K. Shukla, "Designing Chiral Molecules with Near Ir Absorption Through Rational Design And Machine Learning," RD20, Vicksburg, MS, Oct. 27-30, 2020.

- R. W. Lamb, C. E. Webster, “Theoretical Study for Interpreting Time-Resolved Spectra and Excited State Reactivity,” 9th Annual Lester Andrews Graduate Research Symposium, Starkville, MS, May 21-23, 2019.
- R. W. Lamb, C. J. Saint-Louis, M. T. Huggins, A. K. Schrock, C. E. Webster, “Predicting Absorption and Emission Maxima of Tunable Azaborine-containing PAHs,” ACS MS Local Section Meeting, Starkville, MS, Oct. 24, 2018.
- R. W. Lamb, A. J. Huckaba, H. Shirley, S. Guertin, S. Autry, H. Cheema, K. Talukdar, T. Jones, J. W. Jurss, A. Dass, N. I. Hammer, R. H. Schmehl, J. H. Delcamp, C. E. Webster, “Insights into the Mechanism of the HER Catalyzed by (py-NHC-*p*-CF₃Ph)W(CO)₄,” 8th Annual Lester Andrews Graduate Research Symposium, Starkville, MS, May 13-15, 2018.
- R. W. Lamb, J. D. Cope, N. P. Liyanage, P. J. Kelley, J. A. Denny, J. H. Delcamp, T. K. Hollis, C. E. Webster, Preferential Electrochemical Reduction of CO₂ to Formate by a CCC-NHC-Ni Complex: A Computational/Mechanistic Study,” ACS National Meeting & Exposition, New Orleans, LA, Mar. 18-22, 2018.
- R. W. Lamb, A. J. Huckaba, H. Shirley, S. Guertin, S. Autry, H. Cheema, K. Talukdar, T. Jones, J. W. Jurss, A. Dass, N. I. Hammer, R. H. Schmehl, J. H. Delcamp, C. E. Webster, “Photocatalyzed HER: A computational investigation on the mechanism of a novel, record-setting catalyst, (pyNHC-*p*-CF₃Ph)W(CO)₄,” SERMACS, Charlotte, NC, Nov. 7-11, 2017.
- R. W. Lamb, C. J. Saint-Louis, M. T. Huggins, A. K. Schrock, C. E. Webster, “Predicting Absorption and Emission Maxima of Tunable Azaborine-containing PAHs,” SETCA, Oxford, MS, May 18-20, 2017.
- R. W. Lamb, H. Cheema, J. H. Delcamp, C. E. Webster, “Mechanistic Study of HER Catalyzed by a Novel W-NHC Complex,” Feeding and Powering the World 2016: Building the Network, Oxford, MS, Jul. 25-26, 2016.
- R. W. Lamb, E. V. Dornshuld, C. E. Webster, “Computational Investigation of Linkage Isomerization in Sulfoxide-containing Ruthenium Complexes,” SERMACS Memphis, TN, Nov. 4-7, 2015.

Events/Meetings Organized

Co-organizer: 9 th Annual Lester Andrews Graduate Research Symposium	2019
Co-organizer: MSU National Chemistry Week Extravaganza	2018
Co-organizer: 8 th Annual Lester Andrews Graduate Research Symposium	2018

Mentoring

3 graduate students

- Instructed 1st-year graduate students on conducting research in computational chemistry

4 undergraduate students

1 high school student

- Visiting student (1 semester) from Mississippi School for Mathematics and Science. Student began with no experience in computational chemistry.

Service

Current:

Previous:

MSU Department of Chemistry: New-graduate-student mentor	2019 – 2020
Treasurer MSU Chemistry Graduate Student Association	2017 – 2019

References

Research:

Dr. Manoj K. Shukla

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Dr. Charles Edwin Webster

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Dr. Nick Fitzkee

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