

Lauren E. Jarocho

Furman University, Department of Chemistry
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Professional Experience

Furman University

Greenville, SC

2019-2022 Assistant Professor of Chemistry

University of Oxford

Oxford, UK

2015-2019 Stipendiary Lecturer in Physical Chemistry, Lady Margaret Hall

2014-2019 Postdoctoral Research Associate, University of Oxford

Advisor: Prof. Peter J. Hore, Prof. Stuart R. Mackenzie, and Prof. Christiane R. Timmel

Magnetic field effects and cavity-based spectroscopy on de novo flavoproteins

University of North Carolina at Chapel Hill

Chapel Hill, NC

2013 Instructor, HHMI Science Seminar – Department of Chemistry, UNC Chapel Hill

Education

2009-2014 *Ph. D. in Chemistry (May 2014), UNC-Chapel Hill, Dept. of Chemistry Chapel Hill, NC*

Advisor: Prof. Malcolm D.E. Forbes

Electron paramagnetic resonance studies of radical dynamics in surfactant aggregates

2012 *EAPSI Fellow, Tohoku University, IMRAM Sendai, Japan*

Advisor: Prof. Seigo Yamauchi

Proton-coupled electron transfer reactions: insights into mechanism from EPR spectroscopy

2005-2009 *B.A. in Chemistry, Carleton College (June 2009) Northfield, MN*

Advisor: Prof. Will Hollingsworth

Resonance enhanced multiphoton dissociation/ionization of metal carbonyl clusters

Teaching and Mentoring

Furman University

Undergraduate research students: Andrew McHorse (2023), Patrick Holcolme (2023), Emily Dowker (2024), Ivan Weaver (2024), and Sara Rojas (2025)

University of Oxford

PhD and Master's student supervision: Tilo Zollitsch (DPhil 2018), Katie Buckton (MChem 2015), Dan Sowood (MChem 2018)

Undergraduate student supervision: Ashley Redman (summer 2017) and Andrew Markham (summer 2018)

UNC-Chapel Hill

Research Consultant, Chem 190-Special Topics in Chemistry, "You Don't Have to Be a Rocket Scientist." 2012

Graduate research advisor to undergraduate students Eva Ding, (2012-2014) and Shannon Cole (2013-2014).

Grants and Awards

PI, NSF Early Concept Grants for Exploratory Research. EAGER: Illuminating the consequences of membrane association on quantum-based magnetosensing Jul. 2022-Jun. 2024. \$297047
Co-PI, SC EPSCoR GEAR Collaborative Research Grant. *Building a Molecular Compass: Radical Pair-based Magnetosensors from Thermoresponsive Polymer Nanoreactors*. Mar. 2021-Jul. 2022. \$60000
STEM Equity Fellow, Furman University, 2021.
Biotechnology and Biological Sciences Research Council travel grant, 2017.
Oxford Chemistry Management Board conference grant, 2017.
Center for Advanced Electron Spin Resonance conference grant, 2017.
Francis P. Venable Award, Department of Chemistry, UNC Chapel Hill. 2013.
Future Faculty Fellowship, UNC-Chapel Hill. 2013.
PI, NSF and JSPS East Asia and Pacific Summer Institute Fellowship Award. *Proton Coupled Electron Transfer Reactions: Insights into Mechanism from EPR Spectroscopy*, 2012.

Service and Outreach

STEM Inclusive Excellence Team, Furman University, 2022
Academic Scholarship Committee, Chemistry Department, Furman University, 2021-2022
Cultural Life Program Committee, Furman University, 2020-2022
Junior Senior Awards Committee, Chemistry Department, Furman University 2020-2022.
Chemistry First Year Research Experience Awards Committee, Chemistry Department, Furman University, 2020-2021.
American Chemical Society Discussion Series on Virtual Laboratory Instruction, Departmental Representative, 2020.
Equality and Diversity Committee, Department of Chemistry, University of Oxford, 2016-2019., Oxford, UK.
Organizing Committee, 50th Annual International Meeting of the ESR Spectroscopy Group of the Royal Society of Chemistry, 2017, Oxford, UK.
Science Away Day with elementary school students, New College School's College Day, Oxford, UK, 2017.
Organizing Committee, Southern Universities Spectroscopy and Dynamics Group Meeting, 2015, Oxford, UK.
Chair, Gordon Research Seminar on Physical Organic Chemistry, 2013, Holderness, NH. USA.
Presenter, North Carolina Museum of Life and Science, Science of Beer Night, 2010-2013.

Professional Development

The STEM Inclusive Teaching Project, Fall 2021.
Redesign with Flex in Mind Pedagogy Workshop, Furman Faculty Development Center, Summer 2020.
CIMER *Entering Mentoring* Training, January 2019.
Supervising DPhils in Mathematical, Physical, Engineering, and Life Sciences workshop, Oxford, UK, 2017
Future Faculty Development Workshop, UNC-Chapel Hill. 2013.

Publications – undergraduate research students names are underlined

- 1) van den Bergh, W.; Wechsler, S.; Lokupitiya, H. N.; Jarocha, L.; Kim, K.; Chapman, J.; Kweon, K. E.; Wood, B. C.; Heald, S.; Stefik, M., Amorphization of Pseudocapacitive T-Nb₂O₅ Accelerates Lithium Diffusivity as Revealed Using Tunable Isomorphic Architectures. *Batteries & Supercaps* **2022**, 5 (6).
- 2) Xu, J. J.; Jarocha, L. E.; Zollitsch, T.; Konowalczyk, M.; Henbest, K. B.; Richert, S.; Golesworthy, M. J.; Schmidt, J.; Dejean, V.; Sowood, D. J. C.; Bassetto, M.; Luo, J. T.; Walton, J. R.; Fleming, J.; Wei, Y. J.; Pitcher, T. L.; Moise, G.; Herrmann, M.; Yin, H.; Wu, H. J.; Bartolke, R.; Kasehagen, S. J.; Horst, S.; Dautaj, G.; Murton, P. D. F.; Gehrckens, A. S.; Chelliah, Y.; Takahashi, J. S.; Koch, K. W.; Weber, S.; Solov'yov, I. A.; Xie, C.; Mackenzie, S. R.; Timmel, C. R.; Mouritsen, H.; Hore, P. J., Magnetic sensitivity of cryptochrome 4 from a migratory songbird. *Nature* **2021**, 594 (7864), 535-540

- 3) Zoltowski, B.D.; Chelliah, Y.; Wickramaratne, A.; Jarocha, L.E.; Karki, N.; Xu, W.; Mouritsen, H.; Hore, P.J.; Hibbs, R.E.; Green, C.B.; Takahashi, J.S. Chemical and Structural Analysis of a Photoactive Vertebrate Cryptochrome from Pigeon. *Proc. Natl. Acad. Sci. U.S.A.*, **2019**, *116* (39), 19449-19457.
- 4) Bialas, C.; Barnard, D.T.; Auman, D.B.; McBride, R.A.; Jarocha, L.E.; Hore, P.J.; Dutton, P.L.; Stanley R.J.; Moser, C.C. Ultrafast Flavin/Tryptophan Radical Pair Kinetics in a Magnetically Sensitive Artificial Protein. *Phys. Chem. Chem. Phys.*, **2018**, *21*(25), 13453-13461.
- 5) Zollitsch, T.M.; Jarocha, L.E.; Bialas, C.; Henbest, K.B.; Kodali, G.,; Dutton, P.L.; Moser, C.C.; Timmel, C.R.; Hore, P.J.; Mackenzie, S.R. Magnetically Sensitive Radical Photochemistry of Non-natural Flavoproteins. *J. Am. Chem. Soc.*, **2018**, *140* (28), 8705-8713.
- 6) Bialas, C.; Jarocha, L.E.; Henbest, K.; Zollitsch, T.M.; Kodali, G.; Dutton, P.L.; Moser, C.; Timmel, C.R.; Mackenzie, S.R.; Hore, P.J. Engineering an Artificial Flavo-Protein Magnetosensor. *JACS*, **2016**, *138*(51), 16584-16587.
- 7) Tarasov, V. F.; Jarocha, L. E.; Avdievich, N. I.; Forbes, M. D. E., TREPR spectra of micelle-confined spin correlated radical pairs: I. Molecular motion and simulations. *Photochem. Photobiol. Sci.* **2014**, *13* (2), 439-453;
- 8) (g) Tarasov, V. F.; Jarocha, L. E.; Forbes, M. D. E., TREPR spectra of micelle-confined spin correlated radical pairs: II. Spectral decomposition and asymmetric line shapes. *Photochem. Photobiol. Sci.* **2014**, *13* (2), 454-463;
- 9) Cabrera-Rivera, F. A.; Escalante, J.; Morales-Rojas, H.; Zigler, D. F.; Schmidt, R. D.; Jarocha, L. E.; Forbes, M. D. E., Photophysical properties of 2,3-dihydroquinazolin-4(1H)-one derivatives. *Journal of Photochemistry and Photobiology a-Chemistry* **2014**, *294*, 31-37;
- 10) Zigler, D. F.; Ding, E. C.; Jarocha, L. E.; Khatmullin, R. R.; DiPasquale, V. M.; Sykes, R. B.; Tarasov, V. F.; Forbes, M. D. E., Kinetic analysis of nitroxide radical formation under oxygenated photolysis: toward quantitative singlet oxygen topology. *Photochem. Photobiol. Sci.* **2014**, *13* (12), 1804-1811;
- 11) Forbes, M. D. E.; Jarocha, L. E.; Sim, S.; Tarasov, V. F., Time-Resolved Electron Paramagnetic Resonance Spectroscopy: History, Technique, and Application to Supramolecular and Macromolecular Chemistry. In *Advances in Physical Organic Chemistry, Vol 47*, Williams, I. H.; Williams, N. H., Eds. 2013; Vol. 47, pp 1-83;
- 12) Caregnato, P.; Jarocha, L. E.; Esinhart, H. S.; Lebedeva, N. V.; Tarasov, V. F.; Forbes, M. D. E., Electrostatic Control of Spin Exchange Between Mobile Spin-Correlated Radical Pairs Created in Micellar Solutions. *Langmuir* **2011**, *27* (9), 5304-5309

Submitted/In Preparation

- 13) Jarocha, L.E.; Streeter, J. E.; McHorse, A.M.; Lebedeva, N.V.; Dayton, P.A.; Forbes, M.D.E. Structure and stability of phospholipid-based microbubbles studied using the spin probe method. [in preparation for the *Journal of Physical Chemistry Letters*]
- 14) Golesworthy, M.; Zollitsch, T.; Luo, J.; Selby, D.; Jarocha, L. E.; Henbest, K. B., Paré-Labrosse, O.; Bartölke, R.; Schmidt, J.; Xu, J.; Mouritsen, H.; Hore, P. J.; Timmel, C. R.; Mackenzie, S. R. Singlet-triplet dephasing in radical pairs in avian cryptochromes leads to time-dependent magnetic field effects. [in preparation]