

Justin D. Earley (he/him)

Ph.D. in Physical Chemistry

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Application-minded physical chemist with experience in laser spectroscopy, microwave spectroscopy, transition metal complexes, and scientific programming. Seeking a career in chemical/physics research with interests in the areas of quantum sensing, instrument development, solar/renewable fuels, and project management.

Education

- 04/2023 **Doctorates of Philosophy:** Physical Chemistry
University of Colorado Boulder – Boulder, CO
National Renewable Energy Lab – Golden, CO
Advisors: Professor Garry Rumbles Ph.D. & Professor Obadiah Reid Ph.D.
Thesis: “Exploring Spatial Charge Dynamics in Photochemical Sensitization Complexes: from Microwaves to X-Rays”
Collaboration: Bioinspired Light-Escalated Chemistry (BioLEC) Energy Frontier Research Center
- 05/2017 **Bachelor of Science:** Chemistry
University of Wisconsin – Madison – Madison, WI

Previous Projects

- 11/2015 to 05/2017 **University of Wisconsin – Madison** – Madison, WI
Advisor: Professor John Wright Ph.D.
 - Coherent multidimensional spectroscopy of semiconducting materials.
- 03/2015 to 07/2015 **Hochschule Darmstadt University** – Darmstadt, Germany
Advisor: Professor Thomas Burkhart Ph.D.
 - Tribological properties of epoxy when combined with various micro and nano fillers.
- 09/2013 to 05/2015 **University of Wisconsin – Platteville** – Platteville, WI
Advisor: Holly Ziobro Ph.D.
 - Volatile compound analysis of the fungus *Ascocoryne sarcoides* as influenced by metallic salts.
 - Pioneer Undergraduate Research Fellow.

Conferences and Workshops

- 08/2022 **American Chemical Society Fall 2022 Conference** (In-person)
 - Talk: *Counter-ion Association Regulates Electron Transfer in Photoredox Catalysts*
 - Poster: *Resurrecting Solution-phase Microwave Absorption for Measuring Charge Distribution*
- 08/2022 **Gordon Research Conference: Electron Donor-Acceptor** (In-person)
 - Poster: *Charge Transfer Insights via Microwave Absorption Spectroscopy*

- 05/2022 **Advanced Photon Source at Argonne National Lab Users Meeting** (Virtual)
- 08/2021 **American Chemical Society Fall 2021 Conference** (Virtual)
- Talk: *Dielectric-loss spectroscopy: simulation meets experimentation*
- 07/2021 **International Conference on Photochemistry** (Virtual)
- Poster: *Ion pair reorganization of Ir(III) photoredox catalyst revealed by dielectric-loss spectroscopy*
- 01/2020 **Inter-American Photochemical Society Conference** (In-person)
- Poster: *Dielectric-loss Spectroscopy's Contribution to Photoredox Mechanistic Studies*
 - Best Poster Award
- 07/2019 **International Conference on Photochemistry** (In-person)
- Conference student-organizer
 - Poster: *Dipole Strength and Charge Delocalization of Photocatalytic-type Molecules*
- 02/2019 **Canadian Institute for the Advancement of Research Meeting** (In-person)

Teaching and Mentorship

- 05/2020 – 07/2020 **Summer Undergraduate Research Mentor**
National Renewable Energy Lab, SULI Program
- 02/2021 – 02/2022 **Chemistry Graduate Student Committee Representative**
University of Colorado Boulder, Department of Chemistry
- Committee co-founder and representative
- 09/2018 – 05/2019 **Chemistry Undergraduate Mentor**
University of Colorado Boulder, Department of Chemistry
- Program founder and administrator
- 08/2017 – 05/2018 **General Chemistry Teaching Assistant**
University of Colorado Boulder, Department of Chemistry
- Outstanding teaching assistant award
- 08/2015 – 10/2017 **Boys and Girls Club – SCIENCountErs**
University of Wisconsin – Madison, Institute for Chemical Education
- 2013 and 2014 **Engineering Summer Camp Counselor**
University of Wisconsin – Platteville, Department of General Engineering

Additional Skills

- Python
- Igor Pro
- COMSOL Multiphysics – RF Module
- Data analysis and presentation
- Chemical/physical modeling
- Leadership
- Adobe Illustrator/Photoshop
- LaTeX/Overleaf
- GitHub
- AutoCAD
- Project Design
- Conflict Resolution

Publications

Earley, J.D., Mast, Z.J., Reid, O.G., Rumbles, G. Solution-phase Molecular Rotation Calculation for Dipolar Relaxation Times (1.2.0). *Zenodo*. (2022). <https://doi.org/10.5281/zenodo.5873965>

Earley, J.D., Zieleniewska, A., Ripberger, H.H. Shin, N.Y., Lazorski, M.S., Mast, Z.J., Sayre, H.J., McCusker, J.K., Scholes, G.D., Knowles, R.R., Reid, O.G, Rumbles, G., Ion-pair reorganization regulates reactivity in photoredox catalysts. *Nat. Chem.* (2022). <https://doi.org/10.1038/s41557-022-00911-6>