Darien J. Morrow

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EDUCATION

University of Wisconsin–Madison 2015 - Present
PhD: Physical Chemistry. GPA: 4.0/4.0 Madison, WI

- Adviser: John C. Wright.
- Developing ultrafast multidimensional spectroscopies to investigate coherent charge transfer in transition metal dichalcogenide heterostructures

Missouri Western State University 2011-2015
BS (Honors): Chemistry; Minors: Mathematics & Physics. GPA: 4.0/4.0 Saint Joseph, MO

RESEARCH & WORK EXPERIENCE

John C. Wright Research Group 2015 - Present
Graduate Assistant Madison, WI

- Using and developing a suite of ultrafast techniques to explore excited state dynamics of thin film semiconductors relevant to photovoltaics (perovskites and transition metal dichalcogenides)—these techniques include transient transmittance, transient reflectance, and transient grating spectroscopies all with tunable pump and probe colors
- Developing fully coherent probes that are exquisitely sensitive to coherent transfer between layers of a heterostructure
- Studying non-linear mixing in non-resonant media
- Practicing open science; for instance, see our work on GitHub: `github.com/wright-group` & `github.com/darienmorrow` and the Open Science Framework: `osf.io/x9743`

Christopher G. Elles Research Group 2014
REU Fellow Lawrence, KS

- Investigated the excited state dynamics of substituted thiophene photo-rearrangement reactions
- Developed and implemented reaction quantum yield measurement technique
- Used ultrafast transient absorption spectroscopy to probe singlet and triplet excited state manifolds

Michael W. Ducey Research Group 2011 - 2012
Undergraduate Assistant Saint Joseph, MO

- Investigated the solvatochromism of room temperature ionic liquids (RTILs) in common solvents
- Demonstrated the solvents can induce order in the alkyl side chains of methylimidazolium RTILs

Morrow Contracting and Construction LLC 2011 - 2015
Skilled Laborer Saint Joseph, MO

PUBLICATIONS

5. *In preparation:* **Morrow, D. J.**; Kohler, D. D.; Wright, J. C. Multidimensional multiphoton pump, multiphoton probe spectroscopies: applications in Materials Science.

4. **Morrow, D. J.**; Kohler, D. D.; Czech, K. J.; Wright, J. C. Communication: Multidimensional Triple Sum-Frequency Spectroscopy of MoS_2 and Comparisons with Absorption and Second Harmonic Generation Spectroscopies. *Journal of Chemical Physics*. DOI: 10.1063/1.5047802. **2018**.
   · Preprint: arXiv:1805.06985.
   · Data and code repository: DOI 10.17605/OSF.IO/2WF6G.

3. **Morrow, D. J.**; Kohler, D. D.; Wright, J. C. Group and phase velocity mismatch fringes in triple sum-frequency spectroscopy. *Physical Review A*. DOI: 10.1103/PhysRevA.96.063835. **2017**.
   · Preprint: arXiv:1709.10476.
   · Data and code repository: DOI 10.17605/OSF.IO/EMGTA.

2. Fu, Y.; Rea, M. T.; Chen, J.; **Morrow, D. J.**; Hautzinger, M. P.; Zhao, Y.; Manger, L. H.; Wright, J. C.; Goldsmith, R. H.; Jin, S. Selective Stabilization and Photophysical Properties of Metastable Perovskite Polymorphs of $CsPbI_3$ in Thin Films. *Chem. Mater.* DOI: 10.1021/acs.chemmater.7b02948. **2017**.

1. Chen, J.; **Morrow, D. J.**; Fu, Y.; Zheng, W.; Zhao, Y.; Dang, L.; Stolt, M. J.; Kohler, D. D.; Wang, X.; Czech, K. J.; Hautzinger, M. P.; Shen, S.; Guo, L.; Pan, A.; Wright, J. C.; Jin, S. Single-Crystal Thin Films of Cesium Lead Bromide Perovskite Epitaxially Grown on Metal Oxide Perovskite ($SrTiO_3$). *J. Am. Chem. Soc.* DOI: 10.1021/jacs.7b07506. **2017**.
   · Data and code repository: DOI 10.17605/OSF.IO/V5KZN.

POSTERS & PRESENTATIONS

7. Poster. **Darien J. Morrow**, Daniel D. Kohler, John C. Wright. Multi-photon pump, multi-photon probe spectroscopies and their application to MX_2 nanostructures. CMDS 2018, Seoul, South Korea. June 2018.

6. Poster. **Darien J. Morrow**, Jenna M. Wasylenko, Christopher G. Elles. Kinetics and Dynamics of the Photorearrangement Reactions of Aryl-Substituted Thiophenes. ACS National Meeting, Denver, CO. March 2015.

5. Poster. Michael W. Ducey, **Darien J. Morrow**, Bethany Thornton, Varun Lahoti. Conformational behavior and applications of mixed room temperature ionic liquid solvent systems examined with a panel of solvatochromic probes. ACS Midwest Regional Meeting, Columbia, MO. November 2014.

4. Poster. **Darien J. Morrow**, Jenna M. Wasylenko, Christopher G. Elles. Kinetics and Dynamics of the Photorearrangements of Conjugated Thiophenes. Council on Undergraduate Research, Research Experiences for Undergraduates Symposium, Arlington, VA. October 2014.

3. Poster. **Darien J. Morrow**, Jenna M. Wasylenko, Christopher G. Elles. Kinetics and Dynamics of the Photorearrangements of Conjugated Thiophenes. The University of Kansas, REU Poster Session, Lawrence, KS. July 2014.

2. Poster. Melanie Edlin, David J. Freeman, Nathan Harms, Xu Ho, Torin McKinley, Alexander Moore, **Darien J. Morrow**, Christopher Phillips, Jeffrey N. Woodford, Determination of Dimerization Constant of N-(isoquinolin-3-yl)Benzamide and N-(isoquinolin-2-yl)Benzamide. ACS Midwest Regional Meeting, Springfield, MO. October 2013.

1. Poster. **Darien J. Morrow**, Michael W. Ducey, Solvatochromic Properties of Ionic Liquid: Solvent and Polymer Systems Examined with PRODAN. Missouri Western State University, Multidisciplinary Research Symposium, St. Joseph, MO. May 2012.

TEACHING EXPERIENCE

Physical Chemistry: Thermodynamics — Fall 2016
Teaching Assistant for Prof. Gilbert M. Nathanson — Madison, WI

General Chemistry — Fall 2015 - spring 2016
Teaching Assistant for Prof. Ive Herman and Dr. Paul Hooker — Madison, WI

Organic Chemistry II — Fall 2013
Teaching Assistant for Prof. Steven P. Lorimor — Saint Joseph, MO

FELLOWSHIPS & SCHOLARSHIPS

- Link Foundation Energy Fellowship. July 2018 - June 2020.
  Two year full stipend for *Investigation of Coherent Charge Transfer in Transition Metal Dichalcogenide Heterostructures with Multiresonant Coherent Multidimensional Spectroscopy*.
- Pei Wang Fellowship. Fall 2015 - spring 2016.
- Golden Griffon Honors scholarship. Fall 2011 - spring 2015.
- NSF funded Midwest Apex Project scholarship. Fall 2011 - spring 2015.
- Missouri Bright Flight scholarship. Fall 2011 - spring 2015.

AWARDS & HONORS

- Roger Carlson Award for Excellence in Analytical Chemistry. 2018.
- NSF Graduate Research Fellowship Program, Honorable mention. 2017.
- MWSU Department of Chemistry, Edgar C. Little Outstanding Student Award. 2015.
- ACS Division of Analytical Chemistry, Undergraduate Award in Analytical Chemistry. 2015.
- ACS Division of Inorganic Chemistry, Undergraduate Award in Inorganic Chemistry. 2013.
- MWSU President's Honor's List. Fall 2011 - spring 2015.

SERVICE ACTIVITIES & COMMUNITY INVOLVEMENT

- Wisconsin Institute for Discovery volunteer. 2017-present.
- Taught/supervised electronics for a week to high schoolers in the PEOPLE program. Summer 2017.
- Served on panel to talk to REU students about experiences applying to and surviving graduate school. Summer 2017.
- Served as a moderator for the annual Wisconsin Middle School Science Bowl (sponsored by the DOE). 2017-present.
- Talked and demonstrated to Institute of Chemical Education summer camp attendees about my research, renewable energy, and how solar cells work. Summer 2017.
- Served as vice-president (2014-2015) and member of Missouri Western State University's ACS affiliated Chemistry club. 2011-2015.
- Aided in the organization and implementation of Super Science Saturday and Chemathon at Missouri Western State University. 2011-2015.

REFERENCES

- Prof. John C. Wright | wright@chem.wisc.edu | 608-262-0351
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- Prof. Christopher G. Elles | elles@ku.edu | 785-864-1922
  Department of Chemistry
  The University of Kansas
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- Prof. Deniz D. Yavuz | yavuz@wisc.edu | 608-263-9399
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