Blaise J Thompson

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EDUCATION

University of Wisconsin-Madison 2011 - 2018

→ Ph.D.; Analytical Chemistry

Bates College 2007 - 2011

→ B.S.; Major: Chemistry, Minor: Philosophy

EXPERIENCE

Instrumentation Scientist 2018 - Present
UW-Madison Chemistry Madison WI

→ Manage an instrumental "makerspace" for the Chemistry department.
→ Create custom scientific instrumentation for researchers and educators.
→ Serve as a mentor to students undertaking instrumental design projects.
→ Maintain an inventory of over 1000 electronic components.
→ Manage multiple student workers assisting with shop jobs and upkeep.
→ Contribute to open-source software for instrumentation control.
→ Participate in writing, submitting, and reviewing scientific papers.

Graduate Research Assistant 2011 - 2018
John C. Wright Group - ultrafast materials spectroscopy Madison WI

→ Dissertation: *Development of Frequency Domain Multidimensional Spectroscopy with Applications in Semiconductor Photophysics* [doi:10.5281/zenodo.7627321]
→ Designed and constructed software tools to collect and process multidimensional spectra.
→ Designed and constructed optomechanical and electronic hardware.
→ Maintained and conducted experiments on a custom ultrafast laser system.
→ Contributed to general-purpose multidimensional spectra modeling software.

Undergraduate Researcher 2009 - 2011
Matthew J. Cote Group - microscopy and plasmonics Lewiston ME

→ Thesis: *Investigating Plasmons with Total Internal Reflection Microscopy* [PDF]
→ Designed and constructed a combined total internal reflection / atomic force microscope.

Undergraduate Researcher 2008
Michael Dailey Group - neuroscience Iowa City IA

→ Dissected and prepared mouse brain samples for in vivo microglial imaging studies.

High School Researcher 2007
Peter L. Nagy Group - epigenetics Iowa City IA

→ Designed created, and inserted plasmid into yeast.

PUBLICATIONS (see my online cv for more context)

14. The yaq project: Standardized software enabling flexible instrumentation
Sunden, K. F.; Kohler, D. K.; Meyer, K. A.; Cruz Parrilla, P. L.; Wright, J. C.; & Thompson, B. J. (2023) *Review of Scientific Instruments*. doi:10.1063/5.0135255

13. The Wisconsin Oscillator: A Low-Cost Circuit for Powering Ion Guides, Funnels, and Traps
Kregel, S. J.; Thompson, B. J.; Nathanson, G. M.; & Betram, T. H.
(2021) *Journal of the American Society for Mass Spectrometry*. doi:10.1021/jasms.1c00247

12. Versatile Open-Source Photoreactor Architecture for Photocatalysis Across the Visible Spectrum
Lampkin, P. P.; Thompson, B. J.; & Gellman, S. H.
(2021) *Organic Letters*. doi:10.1021/acs.orglett.1c01910

11. Multichannel gas-uptake/evolution reactor for monitoring liquid-phase chemical reactions.
Salazar, C.; Thompson, B. J.; Knapp, S.; Myers, S. & Stahl, S. S.
(2021) *Review of Scientific Instruments*, 92:044103. doi:10.1063/5.0043007

10. The XyloTron: Flexible, Open-Source, Image-Based Macroscopic Field Identification of Wood Products.
Ravindran, P.; Thompson, B. J.; Soares, R. K. & Wiedenhoeft, A. C.
(2020) *Frontiers in Plant Science*. doi:10.3389/fpls.2020.01015

9. WrightTools: a Python package for multidimensional spectroscopy.
Thompson, B. J.; Sunden, K. F.; Morrow, D. K.; Neff-Mallon, N. A. & Wright, J. C.
(2019) *The Journal of Open Source Software*. doi:10.21105/joss.01141

8. Mixed vibrational-electronic Coherent Multidimensional Spectroscopy
Reveals the Electronic Structure of Co(III)balamins Cyanocobalamin and detuerated Aquacobalamin.
Handali, J. D.; Neff-Mallon, N.; Sunden, K. F.; Thompson, B. J.; Brunold, T. C & Wright, J. C.
(2018) *The Journal of Physical Chemistry A*. doi:10.1021/acs.jpca.8b07678

7. Resonant Third-Order Susceptibility of PbSe Quantum Dots
Determined by Standard Dilution and Transient Grating Spectroscopy.
Kohler, D. D., Thompson, B. J. & Wright, J. C.
(2018) *The Journal of Physical Chemistry C*. doi:10.1021/acs.jpcc.8b04462

6. WrightSim: Using PyCUDA to Simulate Multidimensional Spectra
Sunden, K. F., Thompson, B. J. & Wright, J. C.
(2018) *Proceedings of the 17th Python in Science Conference*. doi:10.25080/Majora-4af1f417-00c

5. Exploring Electronic Structure and Order in Polymers via Single-Particle Microresonator Spectroscopy.
Horak, E. H.; Rea, M. T.; Heylman, K. D.; Gelbwaser-Klimovsky, D.;
Saikin, S. K.; Thompson, B. J.; Kohler, D. D.; Knapper, K. A.; Wei, W.; Pan, F.;
Gopalan, P.; Wright, J. C.; Aspuru-Guzik, A. & Goldsmith, Randall H.
(2018) *Nano Letters* doi:10.1021/acs.nanolett.7b04211

4. Frequency-domain coherent multidimensional spectroscopy when dephasing rivals pulsewidth:
Disentangling material and instrument response.
Kohler, D. D.; Thompson, B. J. & Wright, J. C.
(2017) *The Journal of Chemical Physics*. doi:10.1063/1.4986069

3. Measurement of Ultrafast Excitonic Dynamics of Few-Layer MoS_2
Using State-Selective Coherent Multidimensional Spectroscopy.
Czech, K. J.; Thompson, B. J.; Kain, S.; Ding, Q.; Shearer, M. J.;
Hamers, R. J.; Jin, S. & Wright, J. C.
(2015) *ACS Nano*. doi:10.1021/acsnano.5b05198

2. Solution Growth of Single Crystal Methylammonium Lead Halide Perovskite Nanostructures
for Optoelectronic and Photovoltaic Applications.
Fu, Y.; Meng, F.; Rowley, M. B.; Thompson, B. J.; Shearer, M. J.; Ma, D.;
Hamers, R. J.; Wright J. C. & Jin, S.
(2015) *Journal of the American Chemical Society*. doi:10.1021/jacs.5b02651

1. Ionization of High-Density Deep Donor Defect States Explains
the Low Photovoltage of Iron Pyrite Single Crystals.
Cabán-Acevedo, M.; Kaiser, N. S.; English, C. R.; Liang, D.; Thompson, B. J.;
Chen, H.-E.; Czech, K. C.; Wright, J. C.; Hamers, R. J. & Jin, S.
(2014) *Journal of the American Chemical Society*. doi:10.1021/ja509142w

PRESENTATIONS

6. *Presentation:* Thompson, B. J. The Role of Electronics Shops In a Research Environment (2024) *CSHEMA Symposium on Electrical Safety.* Madison, WI USA [PDF]
5. *Invited Speaker:* Thompson, B. J. Scientific Software Development: A Pragmatic Approach (2020) *University of Colorado Boulder Department of Chemistry.* Boulder, CO USA [PDF]
4. *Presentation:* Thompson, B. J. Nonlinear Multidimensional Spectroscopy. (2017) *Chaos and Complexity Seminar.* Madison, WI USA [PDF]
3. *Poster:* Thompson, B. J. A Robust, Fully Automated Algorithm to Collect High Quality OPA Tuning Curves. (2016) *CMDS 2016.* Groningen, the Netherlands [PDF]
2. *Poster:* Thompson, B. J. Utilizing Coherent Multidimensional Spectroscopy to Investigate Nanomaterials for Solar Energy Generation. (2012) *Midwest Universities Analytical Chemistry Conference'*. Madison, WI USA
1. *Poster:* Thompson, B. J. Spectroscpic Investigation of Plasmonic Nanoparticles. (2011) *Bates College Mount David Summit.* Lewiston, ME USA

AWARDS & HONORS

GSFLC Mentor Award 2022, 2023, 2024

→ Awarded by Graduate Students at the University of Wisconsin-Madison for outstanding mentorship of young researchers. Won three times: 2022, 2023, and 2024.

Nominated: Letters & Science Early Career Award 2020

→ Nominated by Chemistry Department faculty, graduate students, and postdocs for outstanding performance, promise of future contributions, and a high degree of professionalism.

Roger Carlson Award 2017

→ Awarded by the University of Wisconsin Chemistry department for excellence in research.

James W. Taylor Excellence in Teaching Award 2016

→ Selected by University of Wisconsin Chemistry students and faculty as one of the most outstanding Teaching Assistants of the 2015-2016 School Year.

Rodney F. Johonnot Graduate Award 2011

→ Selected by Bates College faculty as most deserving of aid in furthering his or her studies in professional or postgraduate work.

Bates College Key 2011

→ Awarded by Bates College faculty and staff to 20 students in each graduating class based on academic standing, character, campus and community service, leadership, and future promise.

TEACHING EXPERIENCE

Graduate Chemical Instrumentation: Design & Control (Electronics) 2017, 2019 - 2023
6 semesters UW-Madison

→ Led laboratory section of course.
→ Introduced graduate students to basic electronics skills such as bread-boarding, oscilloscope usage, component choice and enclosure design and construction.
→ Assisted students during extended independent instrument design and construction.
→ Assisted in course design and improvement.

Fundamentals of Analytical Science (Quantitative Analysis) 2018
Teaching Assistant, 1 semester UW-Madison

→ Led laboratory and discussion sections for honors section.
→ Prepared worksheets and homework keys.
→ Contributed to staff notes for future teaching assistants.

Graduate Instrumental Analysis 2012, 2015
Teaching Assistant, 2 semesters UW-Madison

→ Led laboratory section of course.
→ Prepared homework assignments and led homework review sessions.
→ Lectured in professor's absence.
→ Switched course from mathcad to Python using Jupyter Notebooks, introducing first-year graduate students to script-based programming.
→ Received James W. Taylor Excellence in Teaching Award.

Undergraduate Research Mentor 2012 - 2013, 2015 - 2017
6 semesters UW-Madison

→ Designed appropriate experiments that were complementary to my own research.
→ Introduced undergraduates to spectroscopy, programming, and instrument design.
→ Advised students in coursework and future directions.

General Chemistry II 2011, 2012
Teaching Assistant, 2 semesters UW-Madison

→ Coordinated two sections—total of ~ 50 students in each semester.
→ Led labs.
→ Designed and led discussion sections.

General Chemistry I 2010, 2011
Peer Science Leader, 2 semesters Bates College

→ Designed and led class-wide review sessions for General Chemistry.
→ Assisted in first trials of new peer leadership program at Bates College.
→ Attended regular meetings to share teaching strategies with other peer leaders.

SERVICE ACTIVITES & COMMUNITY INVOLVEMENT

Chemical Coders 2023 - 2024
Organizer Madison WI

→ Worked with three graduate students to start new departmental group focused on software development.
→ Interfaced department with campus data science hub.

Science Olympiad 2019 - 2021
Coach Madison WI

→ Lead "mechatronics" section of region-wide science and engineering competition for middle- and high-school students (2019).
→ Coached "detector building" team of high-school students (2020).
→ Designed and administered exam testing micro-controller programming and basic circuit design and construction.
→ Created and curated real electronic hardware for use during test.

Science Bowl 2017, 2019
Scientific Judge & Moderator Madison WI

→ Judged middle school students in statewide science-knowledge competition.
→ Winning team proceeded to national competition.

Plasma Group Python Introduction 2017
Assistant UW-Madison

→ Helped introduce a group of faculty and graduate Students in Physics to Python.
→ Created lesson sections and chose topics.
→ Group was switching to Python from IDL.
→ Introduction consisted of weekly meetings across several months.

Pre-college Enrichment Opportunity Program for Learning Excellence (PEOPLE) 2017
Volunteer Madison WI

→ Taught disadvantaged high school students about electronics, science and what it is like to be an analytical chemist.

McElvain Committee 2013 - 2014
Member UW-Madison

→ Graduate student committee to choose seminar speakers.

Freewill Folk Society 2008 - 2011
President Bates College

→ Contradance club, offering alcohol-free community-engaging social activity to the college.
→ Reorganized club structure, recruited other students to new club positions.
→ Organized monthly folk dances, bringing in bands and callers.