

# Blaise J Thompson

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## EDUCATION

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<b>University of Wisconsin-Madison</b> → Ph.D.; Analytical Chemistry	2011 - 2018
<b>Bates College</b> → B.S.; Major: Chemistry, Minor: Philosophy	2007 - 2011

## EXPERIENCE

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<b>Instrumentation Scientist</b> <i>UW-Madison Chemistry</i> → 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.	2018 - Present Madison WI
<b>Graduate Research Assistant</b> <i>John C. Wright Group - ultrafast materials spectroscopy</i> → Dissertation: <i>Development of Frequency Domain Multidimensional Spectroscopy with Applications in Semiconductor Photophysics</i> [ <a href="https://doi.org/10.5281/zenodo.7627321">doi:10.5281/zenodo.7627321</a> ] → 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.	2011 - 2018 Madison WI
<b>Undergraduate Researcher</b> <i>Matthew J. Cote Group - microscopy and plasmonics</i> → Thesis: <i>Investigating Plasmons with Total Internal Reflection Microscopy</i> [ <a href="#">PDF</a> ] → Designed and constructed a combined total internal reflection / atomic force microscope.	2009 - 2011 Lewiston ME
<b>Undergraduate Researcher</b> <i>Michael Dailey Group - neuroscience</i> → Dissected and prepared mouse brain samples for in vivo microglial imaging studies.	2008 Iowa City IA
<b>High School Researcher</b> <i>Peter L. Nagy Group - epigenetics</i> → Designed created, and inserted plasmid into yeast.	2007 Iowa City IA

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<sub>2</sub>  
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/acs.nano.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

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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. Spectroscopic Investigation of Plasmonic Nanoparticles. (2011) *Bates College Mount David Summit*. Lewiston, ME USA

## AWARDS & HONORS

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- 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. Jhonnot 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

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### Graduate Chemical Instrumentation: Design & Control (Electronics)

2017, 2019 - 2024

7 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 ACTIVITIES & COMMUNITY INVOLVEMENT

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**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.