

# Blaise J Thompson

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725 W Washington Ave. Apt. 306; Madison, WI 53715; USA

1-424-225-2493 | [blaise@untzag.com](mailto:blaise@untzag.com) | [blaise.zone](http://blaise.zone)

## EDUCATION

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**University of Wisconsin-Madison** 2011 - 2018

→ Ph.D.; Analytical Chemistry

**Bates College** 2007 - 2011

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

## EXPERIENCE

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**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* [PDF]
- 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)

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13. Kregel, S. J.; **Thompson, B. J.**; Nathanson, G. M.; & Betram, T. H. (2021) The Wisconsin Oscillator: A Low-Cost Circuit for Powering Ion Guides, Funnel, and Traps *Organic Letters*. doi:10.1021/jasms.1c00247
12. Lampkin, P. P.; **Thompson, B. J.**; & Gellman, S. H. (2021) Versatile Open-Source Photoreactor Architecture for Photocatalysis Across the Visible Spectrum. *Organic Letters*, 23, 13, 5277–5281. doi:10.1021/acs.orglett.1c01910
11. Salazar, C.; **Thompson, B. J.**; Knapp, S.; Myers, S. & Stahl, S. S. (2021) Multichannel gas-uptake/evolution reactor for monitoring liquid-phase chemical reactions. *Review of Scientific Instruments*, 92:044103. doi:10.1063/5.0043007
10. Ravindran, P.; **Thompson, B. J.**; Soares, R. K. & Wiedenhoef, A. C. (2020) The XyloTron: Flexible, Open-Source, Image-Based Macroscopic Field Identification of Wood Products. *Frontiers in Plant Science*, 11:1015. doi:10.3389/fpls.2020.01015
9. **Thompson, B. J.**; Sunden, K. F.; Morrow, D. K.; Neff-Mallon, N. A. & Wright, J. C. (2019) WrightTools: a Python package for multidimensional spectroscopy. *The Journal of Open Source Software*, 4(33), 1141. doi:10.21105/joss.01141
8. Handali, J. D.; Neff-Mallon, N.; Sunden, K. F.; **Thompson, B. J.**; Brunold, T. C & Wright, J. C. (2018) Mixed vibrational-electronic Coherent Multidimensional Spectroscopy Reveals the Electronic Structure of Co(III)balamins Cyanocobalamin and detuerated Aquacobalamin. *The Journal of Physical Chemistry A* 122 (46), pp 9031–9042. doi:10.1021/acs.jpca.8b07678
7. Kohler, D. D., **Thompson, B. J.** & Wright, J. C. (2018) Resonant Third-Order Susceptibility of PbSe Quantum Dots Determined by Standard Dilution and Transient Grating Spectroscopy. *The Journal of Physical Chemistry C*, 122 (31), 18086–18093. doi:10.1021/acs.jpcc.8b04462 osf.io/3vprb.
6. Sunden, K. F., **Thompson, B. J.** & Wright, J. C. (2018) WrightSim: Using PyCUDA to Simulate Multidimensional Spectra *Proceedings of the 17th Python in Science Conference* doi:10.25080/Majora-4af1f417-00c
5. 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) Exploring Electronic Structure and Order in Polymers via Single-Particle Microresonator Spectroscopy. *Nano Letters* doi:10.1021/acs.nanolett.7b04211
4. Kohler, D. D.; **Thompson, B. J.** & Wright, J. C. (2017) Frequency-domain coherent multidimensional spectroscopy when dephasing rivals pulsewidth: Disentangling material and instrument response. *The Journal of Chemical Physics*, 147(8), 84202. doi:10.1063/1.4986069
3. Czech, K. J.; **Thompson, B. J.**; Kain, S.; Ding, Q.; Shearer, M. J.; Hamers, R. J.; Jin, S. & Wright, J. C. (2015) Measurement of Ultrafast Excitonic Dynamics of Few-Layer MoS<sub>2</sub> Using State-Selective Coherent Multidimensional Spectroscopy. *ACS Nano*, 9(12), 12146–12157. doi:10.1021/acs.nano.5b05198
2. Fu, Y.; Meng, F.; Rowley, M. B.; **Thompson, B. J.**; Shearer, M. J.; Ma, D.; Hamers, R. J.; Wright J. C. & Jin, S. (2015) Solution Growth of Single Crystal Methylammonium Lead Halide Perovskite Nanostructures for Optoelectronic and Photovoltaic Applications. *Journal of the American Chemical Society*, 137(17), 5810–5818. doi:10.1021/jacs.5b02651
1. 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) Ionization of High-Density Deep Donor Defect States Explains the Low Photovoltage of Iron Pyrite Single Crystals. *Journal of the American Chemical Society*, 136(49), 17163–17179. doi:10.1021/ja509142w

## PRESENTATIONS

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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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- 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 - 2021

*Teaching Assistant, 1 semester. Lab Manager, 3 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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### 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.