

Joshua S. Ostrander

Indiana Wesleyan University
4201 S Washington St
Marion, IN 46953

josh.ostrander@indwes.edu
Office: (765)-677-1659

Education

Ph.D. in Physical Chemistry
University of Wisconsin-Madison, Madison, WI
Advisor: Prof. Martin Zanni

B.S. in Chemistry with a Minor in Physics
Indiana Wesleyan University, Marion, IN
Advisor: Prof. Steven Tripp
Summa Cum Laude

Teaching Experience

Assistant Professor of Chemistry July 2019-Present
Indiana Wesleyan University
Courses: General Chemistry Lecture (CHE 125), General Chemistry Lab (CHE 125L/126L), Physical Chemistry (CHE 440/450), Physical Chemistry Lab (CHE 461).

Graduate Teaching Assistant September 2014-May 2015
University of Wisconsin-Madison
Taught laboratory and discussion sections for Chemistry 115/116, the honors chemistry course for first year students.

Teaching Assistant, September 2012-April 2014
Indiana Wesleyan University
Taught lab section for CHE 125/126 (General Chemistry) and CHE 221 (Organic Chemistry 2).

Research Experience

Assistant Professor of Chemistry July 2019-Present
Indiana Wesleyan University, Department of Chemistry
Topic: Vibrational spectroscopy as a probe of interfacial chemistry

Graduate Research Assistant November 2014-May 2019
University of Wisconsin-Madison, Department of Chemistry
Advisor: Prof. Martin Zanni
Topic: Nonlinear spectroscopy and chemical imaging: Structure and dynamics of materials and biological systems.

Undergraduate Research Assistant: January 2012-May 2014
Indiana Wesleyan University, Department of Chemistry
Advisor: Prof. Steven Tripp
Topic: Solvent effects on the kinetics of unimolecular reactions

Undergraduate Research Assistant: May 2013-August 2013
University of Michigan, Department of Chemistry
Advisor: Prof. Kevin Kubarych

Topic: 2D IR spectroscopy of metal carbonyls: Toward site-specific probes of biomolecule hydration

Peer Reviewed Publications

*Denotes Equal Contribution

+Denotes Undergraduate Co-author

1. Farrell, K.*; **Ostrander, J.S.***; Jones, A.C; Zanni, M.T. "Design and Implementation of a 100 kHz 2D IR Spectrometer" *In Preparation*
2. **Ostrander, J.S.**; Lomont, J.P.; Rich, K.L.; Saraswat, V.; Feingold, B.R. +; Petti, M.K; Birdsall, E.R.; Arnold, M.S.; Zanni, M.T. "Monolayer Sensitivity Enables a 2D IR Spectroscopic Immuno-biosensor for Studying Protein Structures: Application to Amyloid Polymorphs" *J. Phys. Chem. Lett.* 10, 3836-3842 (2019)
3. Alperstein, A.M.; **Ostrander, J.S.**; Zhang, T.O.; Zanni, M.T. "Amyloid found in human cataracts with two-dimensional infrared spectroscopy" *Proc. Natl. Academy of Sciences* 16 (14) 6602-6607 (2019)
4. Petti, M.K.*; **Ostrander, J.S.***; Saraswat, V.; Birdsall, E; Rich, K.L.; Lomont, J.P.; Arnold, M.S.; Zanni, M.T. "Enhancing the signal strength of surface sensitive 2D IR spectroscopy" *J. Chem. Phys.*, 150, 024707 (2019)
5. Saraswat, V.; Jacopberger, R.; **Ostrander, J.S.**; Hummell, C.; Way, A.; Zanni, M.T.; Arnold, M.S. "Water Permeation Through Size-Controlled Graphene Oxide Laminates" *ACS Nano*, 12, 7855-7865 (2018)
6. Lomont, J.P.; Rich, K.L.; Maj, M., Ho, J.J., **Ostrander, J.S.**; Zanni, M.T. "2D IR Spectroscopy Can Distinguish Stable A β Fibers from Less Stable β -Sheet Rich Oligomers" *J. Phys. Chem. B*, 122, 144-153, (2018)
7. Lomont, J.P.; **Ostrander, J.S.**; Ho, J.J.; Petti, M.K.; Zanni, M.T. "Not All β -sheets Are the Same: Amyloid Infrared Spectra, Transition Dipole Strengths, and Couplings Investigated with 2D IR Spectroscopy" *J. Phys. Chem. B*, 121, 8935-8945, (2017)
8. **Ostrander, J.S.**; Knepper, R.; Tappan, A.S.; Kay, J.J. Zanni, M.T.; Farrow, D.A. "Energy Transfer Between Coherently Delocalized States in the Explosive Pentathyrilol Tetranitrate (PETN) Revealed with 2D IR Spectroscopy" *J. Phys. Chem. B*, 121, 1352-1361, (2017)
9. Ghosh, A.; **Ostrander, J.S.**; Zanni, M.T. "Watching Proteins Wiggle: Mapping Structures with Two-dimensional Infrared Spectroscopy" *Chem. Rev.*, 117, 10726-10759, (2017)
10. **Ostrander, J.S.**; Serrano, A.L.; Ghosh, A.; Zanni, M.T. "Spatially Resolved 2D IR Spectroscopy via Wide-Field Microscopy" *ACS Photonics*, 3, 1315-1323, (2016)
11. Ghosh, A., Serrano, A.L.; Oudenhoven, T.A.; **Ostrander, J.S.**; Eklund, E.C.*; Blair, A.F.*; Zanni, M.T. "Experimental implementations of 2D IR Spectroscopy through a horizontal pulse shaper design and a focal plane array detector" *Opt. Lett.*, 41 (3), 524-527, (2016)
12. Serrano, A.L.; Ghosh, A.; **Ostrander, J.S.**; Zanni, M.T. "Wide-field FTIR microscopy with mid-IR pulse shaping" *Optics Express*, 23, 17815, (2015)

Selected Presentations

Ostrander, J.S. (2018) "What can we learn about cataracts, diabetes, Alzheimer's disease, and explosives with femtosecond laser pulses? New advances in multidimensional IR spectroscopy" Indiana Wesleyan University (*Talk*)

Ostrander, J.S., Zanni, M.T. (2017) "Spatially Resolving Vibrational Coupling for Structure Identification with Hyperspectral 2D IR Microscopy" SciX 2017. Reno, NV. (*Invited Talk*)

Ostrander, J.S., Serrano, A.L., Ghosh, A., Zanni, M.T. (2016) " Spatially Resolved 2D IR Spectroscopy via Wide-field Microscopy." Gordon Research Conference: Vibrational Spectroscopy. Biddeford, ME. (*Poster*)

Ostrander, J.S., Serrano, A.L., Ghosh, A., Zanni, M.T. (2015) " Wide-field FTIR Microscopy using mid-IR Pulse Shaping." Time Resolved Vibrational Spectroscopy. Madison, WI. (*Poster*)

Ostrander, J.S., Tripp, S.L. (2013) "Demonstrations of Unimolecular Substitution Reactions and the Effects of the Leaving Group, Solvent, Structure, and Temperature on the Rate of Reaction." American Chemical Society National Meeting. Indianapolis, IN. (*Poster*)

Ostrander, J.S., Tripp, S.L. (2013) "Demonstrations of Unimolecular Substitution Reactions and the Effects of the Leaving Group, Solvent, Structure, and Temperature on the Rate of Reaction." Butler University Undergraduate Research Conference. Indianapolis, IN (*Talk*)

University and Community Leadership

Lead Host, University of Wisconsin Department of Chemistry Graduate Recruiting

Organized recruiting weekend for prospective graduate students.
2017

Vice President, Indiana Wesleyan University Society of Physics Students

Lead SPS meetings, submitted outreach grant proposals, organized science outreach events.
2012-2014

Chemistry Lab Event Coordinator, Northridge Science Olympiad Invitational

Organized the "Chem. Lab" event for statewide high school science competition.
2012- 2014

Awards

Richard and Joan Hartl Award for Excellence in Research	2019
GSFLC Mentor Award	2019
Poster Award, Gordon Conference: Vibrational Spectroscopy	2016
Honorable Mention, NSF Graduate Research Fellowship	2015,2016
Honored Instructor Award, UW-Madison	2014
K.V. Reddy Fellowship, UW-Madison	2014
Pei Wang Fellowship, UW-Madison	2014
Valedictorian, IWU	2014
CRC Freshman Chemistry Achievement Award	2011

Outreach

Wisconsin Science Festival (2014,2015,2016)

MRSEC Volunteer