

Stephanie Frost

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Education

University of South Florida August 2021-May 2025
Ph.D. Chemistry – Chemistry Education Research

University of Wisconsin-Madison September 2017-May 2021
B.S. Chemistry, French

Research Experience

The Ohio State University June 2025-Present
Advisors: Dr. Meng-Yang M. Wu and Dr. Jocelyn E. Nardo
Research Area: Evaluating graduate teaching assistant training for large-enrollment chemistry courses

University of South Florida August 2021-May 2025
Advisor: Dr. Jeffrey R. Raker
Research Area: Dimensions of introductory organic chemistry learner experiences: Understanding explanations, motivation, and shame

University of Wisconsin-Madison January 2019-September 2019
Advisor: Dr. James Ntambi
Research Area: Understanding the effect of diet and metabolism through gene expression in mice liver

University of Wisconsin-Madison January 2018-December 2018
Advisor: Dr. Silvia Cavagnero
Research Area: Exploring the rotational correlation time of apomyoglobin in physiologically relevant conditions

Publications

Crowder, C. J., Yik, B. J., Frost, S. J. H., Cruz-Ramírez de Arellano, D., Bliss-Roche, K., & Raker, J. R. (Under review) Development of a machine learning model to predict the level of explanation sophistication for organic chemistry reaction mechanisms. *Journal of Science Education and Technology*.

Chisam, J., Frost, S. J. H., Nardo, J. E. (Under review). Code for Convenience: Python and R Solutions for Preparing Zoom Transcripts. *Journal of Chemical Education*.

Frost, S. J. H., Raker, J. R., Bentley, A. K., Lin, S., Pratt, J. M., Reisner, B. A., & Stewart, J. L. (2025). Characterizing a Community of Practice through Coauthorship of Curricular Materials: A Social Network Analysis of the Interactive Online Network of Inorganic Chemists (IONiC). *Journal of Chemical Education*, 102(9), 3807-3816. <https://doi.org/10.1021/acs.jchemed.5c00455>

Frost, S. J. H., Pratt, J. M., Cruz-Ramírez de Arellano, D., Bliss-Roche, K., & Raker, J. R. (2024). Feelings of Shame in a First Semester Organic Chemistry Course: Associations between Shame and Examination Performance for Multiple Learner Groups. *Journal of Chemical Education*, 101(10), 4136–4148. <https://doi.org/10.1021/acs.jchemed.4c00754>

Frost, S. J. H., Rocabado, G. A., Pratt, J. M., Cruz-Ramírez de Arellano, D., Fields, K. B., & Raker, J. R. (2024). Motivation Differences in First-Semester Organic Chemistry: A Comparison Between First-Time-in-College Students and Transfer Students. *Journal of Chemical Education*, 101(2), 354–363. <https://doi.org/10.1021/acs.jchemed.3c00579>

Crowder, C. J., Yik, B. J., Frost, S. J. H., Cruz-Ramírez de Arellano, D., & Raker, J. R. (2024). Impact of Prompt Cueing on Level of Explanation Sophistication for Organic Reaction Mechanisms. *Journal of Chemical Education*, 101(2), 398–410. <https://doi.org/10.1021/acs.jchemed.3c00710>

Frost, S. J. H., Yik, B. J., Dood, A. J., Cruz-Ramírez de Arellano, D., Fields, K. B., & Raker, J. R. (2023). Evaluating electrophile and nucleophile understanding: A large-scale study of learners' explanations of reaction mechanisms. *Chemistry Education Research and Practice*, 24(2), 706–722. <https://doi.org/10.1039/D2RP00327A>

Yik, B. J., Dood, A. J., Frost, S. J. H., Cruz-Ramírez de Arellano, D., Fields, K. B., & Raker, J. R. (2023). Generalized rubric for level of explanation sophistication for nucleophiles in organic chemistry reaction mechanisms. *Chemistry Education Research and Practice*, 24(1), 263–282. <https://doi.org/10.1039/D2RP00184E>

Contributed Conference Presentations

**Presenter*

Developing machine learning models for evaluating organic chemistry learners' explanations of electrophiles and nucleophiles

Caroline J. Crowder,* Brandon J. Yik, Stephanie J. H. Frost, Daniel Cruz-Ramírez de Arellano, Kimberly Bliss-Roche, & Jeffrey R. Raker. Oral presentation at the Southeastern/Southwest Regional Meeting of the American Chemical Society (SERMACS/SWRM 2025), Orlando, FL, October 29, 2025

Using Social Network Analysis to Explore the Development of the Interactive Online Network of Inorganic Chemistry (IONiC) Community of Practice: Co-authorship as a Means for Community Evaluation

Jeffrey R. Raker*, Stephanie J. H. Frost. Oral presentation at the Southeastern/Southwest Regional Meeting of the American Chemical Society (SERMACS/SWRM 2025), Orlando, FL, October 27, 2025

Using Social Network Analysis to Explore Co-authorship of Curricular Materials: Insight into the IONiC Community of Practice

Stephanie J. H. Frost*, Jeffrey R. Raker, Anne K. Bentley, Justin M. Pratt, Barbara A. Reisner, & Joanne L. Stewart. Presented at the 28th Biennial Conference on Chemical Education (University of Kentucky), Lexington, KY, July 31, 2024

Characterization of shame experiences in introductory organic chemistry courses using the AEQ-OCHEM instrument

Stephanie J. H. Frost*, Justin M. Pratt, & Jeffrey R. Raker. Presented at the 28th Biennial Conference on Chemical Education (University of Kentucky), Lexington, KY, July 30, 2024

Development of a machine learning model to understand conceptualizations of electrophiles

Stephanie J. H. Frost*, Brandon J. Yik, Amber J. Dood, Daniel Cruz-Ramírez de Arellano, Kimberly B. Fields, Frankie Costanza, & Jeffrey R. Raker. Presented at the 27th Biennial Conference on Chemical Education (Purdue University), West Lafayette, IN, August 3, 2022

Applications of computer-based scoring for the teaching and learning of reaction mechanisms in organic chemistry

Brandon J. Yik*, Stephanie J. H. Frost, Daniel Cruz-Ramírez de Arellano, Kimberly B. Fields, Frankie Costanza, & Jeffrey R. Raker. Presented at the 27th Biennial Conference on Chemical Education (Purdue University), West Lafayette, IN, August 3, 2022

Teaching Experience

Teaching Assistant – Organic Chemistry I & II August 2021-May 2025
University of South Florida
Organic Chemistry I – Fall 2022-Fall 2023, Fall 2024-Spring 2025
Organic Chemistry II – Fall 2021-Spring 2022

Undergraduate Assistant – General Chemistry II (Teaching Assistant) January 2021-May 2021
University of Wisconsin – Madison

Laboratory Assistant – General Chemistry August 2019-December 2020
University of Wisconsin – Madison
Advanced General Chemistry – Fall 2020
General Chemistry II – Fall 2019-Spring 2020

Private General and Organic Chemistry Tutor June 2019-May 2021
University of Wisconsin – Madison

Service

Peer Review Activities
Reviewer, *Journal of Chemical Education, Chemistry Education Research and Practice, Ohio State University's Fall 2025 President's Research Excellence Accelerator Competition* (grant)

Awards

University of South Florida Dissertation Completion Fellowship Spring 2024
Martin Travel Award Spring 2023 & Spring 2024

Community Involvement

Sigma Psi Zeta Sorority, Inc. August 2021-Present
Education Director, Assistant Vice President of New Member Education,
Vice President of Operations

Chemistry Council of Graduate Students at the University of South Florida August 2023-May 2025
Secretary