

Mark R. Ams, Ph.D.

mark.ams@uvm.edu

A. EDUCATION

- 2007 Ph.D., Chemistry Department, University of Pittsburgh (Pittsburgh, PA).
 Advisor: Dr. Craig S. Wilcox
- 2002 B.A., Chemistry Department, Albion College (Albion, MI).

B. PROFESSIONAL APPOINTMENTS

- 2025-present Lecturer, Chemistry Department, University of Vermont (Burlington, VT).
- 2023-25 Assistant Professor (*tenure-track*), Chemistry Department, New Mexico Institute
 of Mining and Technology (Socorro, NM).
- 2016-22 Associate Professor (*tenured*), Chemistry Department, Allegheny College
 (Meadville, PA).
- 2016 Guest Professor (*sabbatical*), Chemistry Department, Eidgenössische Technische
 Hochschule Zürich (Zürich, Switzerland).
 Laboratory: Dr François Diederich
- 2009-16 Assistant Professor (*tenure-track*), Chemistry Department, Allegheny College
 (Meadville, PA).
- 2007-09 Skaggs Post-Doctoral Fellow, Chemistry Department, The Scripps Research
 Institute (La Jolla, CA).
 Advisor: Dr. Julis Rebek, Jr.

C. SELECT COURSES TAUGHT

- | | |
|---|---|
| 100-Level: General Chemistry I and II | 300-Level: Organic Chemistry II,
Multistep Synthesis |
| 200-Level: Organic Chemistry I,
Research Methods | 400-Level: Advanced Organic Chemistry |
| | 500-Level: Structure and Energy |

D. PUBLICATIONS

Peer-reviewed publications from independent career:

- 2024 **Ams, M. R.**; McAuliffe, J.; Semenick, R.; Zeller, M. Self-replication Without
Hydrogen-bonds: An Exobiotic Design. *Chem. Eur. J.* 2024, e202001446.

- 2019 **Ams, M. R.**; Trapp, N.; Schwab, A.; Milić, J. V.; Diederich, F. Chalcogen Bonding “2S—2N Squares” versus Competing Interactions: Exploring the Recognition Properties of Sulfur. *Chem. Eur. J.* 2019, 25, 323—333.
- 2016 Sherman, M. C.; **Ams, M. R.**; Jordan, K. D. Symmetry-Adapted Perturbation Theory Energy Analysis of Alkyl Fluorine-Aromatic Interactions in Torsion Balance Systems. *J. Phys. Chem. A.* 2016, 120, 9292—9298.
- 2015 **Ams, M. R.**; Fields, M.; Grabnic, T.; Janesko, B. G.; Zeller, M.; Sheridan, R.; Shay, A. Unraveling the Role of Alkyl F on CH— π Interactions and Uncovering the Tipping Point of Fluorophobicity. *J. Org. Chem.* 2015, 80, 7764—7769.
- 2014 Janesko, B. G.; **Ams, M. R.** Dispersion-corrected DFT study on methano and ethano bridged Wilcox torsion balances. *Theor. Chem. Acc.* 2014, 133, 1490.
- 2011 Bhayana, B.; **Ams, M. R.** Effect of Diazocine Bridgehead Modification on the Folding of the Wilcox Molecular Torsion Balance: A View from a Different Angle. *J. Org. Chem.* 2011, 76, 3594—3596.

Peer-reviewed publications from post-doctoral and graduate work:

- 2010 Dube, H.; **Ams, M. R.**; Rebek, J., Jr. Supramolecular Control of Fluorescence through Reversible Encapsulation. *J. Am. Chem. Soc.* 2010, 132, 9984—9985.
- 2009 **Ams, M. R.**; Ajami, D.; Craig, S. L.; Yang, J.; Rebek, J., Jr. Control of stilbene conformation and fluorescence in self-assembled capsules. *Beilstein J. Org. Chem.* 2009, 5, 79.
- 2009 **Ams, M. R.**; Ajami, D.; Craig, S. L.; Yang, J.; Rebek, J., Jr. “Too Small, Too Big, and Just Right” – Optical Sensing of Molecular Conformations in Self-Assembled Capsules. *J. Am. Chem. Soc.* 2009, 131, 13190—13191.
- 2007 **Ams, M. R.**; Wilcox, C. S. Benzil-Tethered Precipitons for Controlling Solubility: A Round-Trip Energy-Transfer Mechanism in the Isomerization of Extended Stilbene Analogues. *J. Am. Chem. Soc.* 2007, 129, 3966—3972.
- 2006 **Ams, M. R.**; Wilcox, C. S. Intramolecularly Sensitized Precipitons: A Model System for Application to Metal Sequestration. *J. Am. Chem. Soc.* 2006, 128, 250—256.

E. EXTERNAL GRANTS AND AWARDS

- 2020 Charles F. Kaufman Foundation: Integrated Research-Education Grant, ID KA2020-114801 (PI). Toward Creating Alien Life: A Genetic Self-Replicating System using Chalcogen Bonds. \$100,000

- 2017 National Science Foundation Award ID #1726109 (Co-PI). MRI: Acquisition of a 400 MHz NMR Spectrometer Console to Enhance Faculty and Undergraduate Research at Allegheny College. \$236,990
- 2012 Research Corporation Single-Investigator Cottrell College Science Award ID #20883 (PI). Molecular Torsion Balances for Probing the Distance Dependency of CH- π Interactions. \$35,000

F. INTERNAL GRANTS AND AWARDS

- 2024 NIH INBRE M590. NMT subaward recipient for undergraduate summer research. \$8,638

G. INVITED TALKS

- 2025 Revisiting the Henderson-Hasselbalch Equation. University of Vermont, Burlington, VT, May 28, 2025. (*virtual*)
- 2022 Exciting Applications of Cooperative Interactions: From Drug Design to Self-Replicating Molecules. Denison University, Granville, OH, October 25, and New Mexico Tech, Socorro, NM, December 19. (*in person*)
- 2022 Chalcogens and Halogens: Expanding Horizons from Biomimetic Clefts to Alien Life. University of Northern Colorado, Greeley, CO, April 25. (*in person*)
- 2021 Molecular Recognition: Turning Principles into Applications. Western Kentucky University, Bowling Green, KY, March 3. (*in person*)
- 2019 Uncovering the Origins of Intermolecular Interactions. Dickinson College, Carlisle, PA, November 1. (*in person*)
- 2019 Exploring the Recognition Properties of Chalcogens. Eidgenössische Technische Hochschule Zürich, Zurich, Switzerland, June 4. (*in person*)

H. PROFESSIONAL CONFERENCE PRESENTATIONS

- 2024 Merging Experiments with Computations: Assessing Drug Fragments Using Free Energy Methods. CUP XXII Conference, March 5-7. (*in person*)
- 2023 Exploring the hidden role of entropy in non-covalent interactions: Molecular torsion balance approach. 82nd ABQ NMR² Conference, November 11. (*in person*)
- 2023 Halogens in hydrophobic spaces: What governs their interactions? American Chemical Society National Meeting & Exposition, March 26-30. (*in person*)

- 2022 Haloalkane behavior in hydrophobic environments: Implications for drug design. American Chemical Society Northeast Regional Meeting, Oct. 2-5. (*in person*)
- 2022 Halogens in hydrophobic pockets: Evaluating cooperativity in small spaces. 263rd American Chemical Society National Meeting & Exposition, March 19-23. (*in person*)
- 2022 New self-replicating system using chalcogen bonds. 263rd American Chemical Society National Meeting & Exposition, March 19-23. (*in person*)
- 2022 Using fluorine to quantify entropy in hydrophobic clefts. 25th Winter Fluorine Conference, American Chemical Society, Division of Fluorine Chemistry, January 16-21. (*Accepted but not presented due to COVID-19*)
- 2020 Recognition properties of 2,1,3-benzoselenadiazoles: Window into chalcogen bonding. 259th American Chemical Society National Meeting & Exposition, March 22-26. (*Accepted but not presented due to COVID-19*)
- 2020 Investigating alkyl halogen- π interactions: Torsion balance approach. 259th American Chemical Society National Meeting & Exposition, March 22-26. (*Accepted but not presented due to COVID-19*)

I. SERVICE TO THE PROFESSION

Refereed Journal Articles:

- 2025 *Nature Commun.* (3)
- 2024 *Chem. – Eur. J.* (1)
- 2023 *Isr. J. Chem.* (1)
- 2022 *Asian J. Org. Chem.* (1)
- 2021 *Chem. – Asian J.* (1)
- 2020 *Chem. – Eur. J.* (1), *J. Am. Chem. Soc.* (1)

J. PROFESSIONAL MEMBERSHIPS OR AFFILIATIONS

- 1999-2025 American Chemical Society