Mar 2022

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APPOINTMENTS AND EDUCATION

The College of Wooster, Department of Chemistry, Wooster, OH

2021–present Professor
2010–2021 Associate Professor (Department Chair 2016-2020)
2004–2010 Assistant Professor

Department of Chemistry and Biochemistry /
California NanoSystems Institute, University of California, Los Angeles

2002–2004 Postdoctoral Fellow
Advisor: J. Fraser Stoddart (2016 Nobel Laureate)

University of Wisconsin-Madison, Department of Chemistry, Madison, WI

2001 Ph.D. Organic Chemistry
Advisor: Robert J. McMahon
Matrix Isolation and Computational Investigation of Naphthylcarbene Rearrangements

Kenyon College, Gambier, OH

1996 B.A. Chemistry (Physics Minor)
Phi Beta Kappa, *summa cum laude*, highest departmental honors
Advisor: Patrick E. O'Bannon; Research thesis *π-Selectivity and Reactivity in the Cyclopropanation of Substituted Propelladienes*

TEMPORARY APPOINTMENTS

2020-21 **Visiting Scientist,** University of Akron, Akron, OH
Sabbatical appointment; collaboration with David Modarelli)

2015-16 **Visiting Researcher,** ABS Materials, Inc., Wooster, OH
Sabbatical appointment

2010-11 **Visiting Assistant Professor,** Case Western Reserve University, Cleveland, OH
Sabbatical appointment; collaboration with Stuart Rowan, Department of Macromolecular Science and Engineering

2003 **Instructor** Mount St. Mary's College, Department of Physical Sciences and Mathematics, Los Angeles, CA (taught one General Chemistry and one Organic Chemistry class),

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS

American Chemical Society
Council on Undergraduate Research
Phi Beta Kappa (Kappa of Ohio Chapter; officer for multiple years)

AWARDS, HONORS, AND NATIONAL SERVICE

2017-present **Chief Reader, AP Chemistry**
Establish and implement scoring practices for 160,000+ AP Chemistry exams annually
Serve on test development committee that writes questions and contributes to national curriculum
Disseminate AP Exam results and advice to teachers via conferences, webinars, and written reports

2015 **Invited Speaker / Travel Award for "Small Splash, Big Waves"**
American Chemical Society Division of Organic Chemistry symposium for researchers in organic chemistry at primarily undergraduate institutions

2008 **Division of Organic Chemistry Travel Award**
Supporting travel to ACS National Meeting in April 2008

2005 **Cottrell College Science Award**
Research grant from Research Corporation for 2006-2008

2000 **Sam Charles Slifkin Award, University of Wisconsin-Madison**
Competitive departmental fellowship awarded to senior graduate students

1998 **University of Wisconsin College of Letters and Science Teaching Fellow**
Developed and conducted a training workshop for new teaching assistants. Eighteen award recipients were selected from a pool of 1,100 teaching assistants at the University of Wisconsin.

1998 **Department of Chemistry Outstanding Teaching Assistant Award**
Recognition for excellence in undergraduate instruction, awarded to eight teaching assistants in the University of Wisconsin Department of Chemistry

1996 **Samuel McElvain Graduate Fellow, University of Wisconsin-Madison**
Merit-based departmental award for first-year graduate students

1996 **American Chemical Society Award, Kenyon College**
Awarded to an outstanding undergraduate senior chemistry major

1995 **Phi Beta Kappa,** Kenyon College (elected as Junior)

1992 **Eagle Scout**

PEER-REVIEWED PUBLICATIONS

§ Denotes College of Wooster undergraduate co-author
‡ Denotes other undergraduate co-author
* Denotes College of Wooster faculty co-author

16. Koemm, K. A.;§ DeBord, M.;§ Wright, B. D.; Wagers, P. O.; Panzner, M. J.; Stromyer, M.; Youngs, W. J.; Chatterjee, S.; Bryan, S. A.; **Bonvallet, P. A.;** Collins, S.* Effects on Human Non-Small Lung Cancer Cell growth of Cu(II), Au(III), and Re(I) Complexes Containing N-donor Pyridyl Ligands: A Senior Undergraduate Research Project. *Chem. Educator* **2020,** *25,* 139-145.

15. **Bonvallet, P. A.**; Lindner, J. A.;* Corbin, B.;‡ Crow, D.;§ Reffner, R.;‡ Albon Riedl, T.;§ Lehman, S. Y.;* Edmiston, P.* Modeling and measuring the absorption-induced expansion of swellable organically modified silica. *AIP Advances* **2020,** *10,* 065136. DOI: 10.1063/5.0009552

14. Amburgey-Peters, J. C.;* **Bonvallet, P. A.** "Spectroscopy First" for Interweaving and Scaffolded Learning in Organic Chemistry, In *NMR Spectroscopy in the Undergraduate Curriculum: First Year and Organic Chemistry Courses Volume 2*; Soulsby, D.; Anna, L. J.; Wallner, A. S., Eds.; ACS Symposium Series; American Chemical Society: Washington, DC, 2016, pp 49-51. DOI: 10.1021/bk-2016-1221.ch004

13. **Bonvallet, P. A.** Detective work (invited book review of *The Scientific Sherlock Holmes*). *Nature Chemistry* **2013,** *5,* 441. DOI: 10.1038/nchem.1665

12. **Bonvallet, P. A.**; Amburgey-Peters, J. C.* Data vs. Dogma: Introducing NMR Early in Organic Chemistry to Reinforce Key Concepts, In *NMR Spectroscopy in the Undergraduate Curriculum*; Soulsby, D., Ed.; ACS Symposium Series; American Chemical Society: Washington, DC, 2013. DOI: 10.1021/bk-2013-1128.ch003

11. **Bonvallet, P. A.**; Mullen, M. R.;§ Evans, P. J.;§ Stoltz, K. L.;§ Story, E. N.§ Improved functionality and control in the isomerization of a calix[4]arene-capped azobenzene. *Tetrahedron Lett.* **2011,** *52,* 1117-1120. DOI: 10.1016/j.tetlet.2010.12.107

10. **Bonvallet, P. A.**; Breitkreuz, C. J.; Kim, Y. S.; Todd, E. M.;‡ Traynor, K.; Fry, C. G.; Ediger, M. D.; McMahon, R. J. Organic Glass-Forming Materials: 1,3,5-Tris(naphthyl)benzene Derivatives. *J. Org. Chem.* **2007**, *72*, 10051-10057. DOI: 10.1021/jo701921m

9. Huang, T. J.; Flood, A. H., Brough, B.; Liu, Y.; **Bonvallet, P. A.**; Kang, S.; Chu, C.-W.; Guo, T. F.; Lu, W.; Yang, Y.; Stoddart, J. F.; Ho, C.-M. Understanding and Harnessing Biomimetic Molecular Machines for NEMS Actuation Materials. *IEEE Trans. Autom. Sci. Eng.* (special issue on nanoscale automation and assembly) **2006**, *3*, 254-259. DOI: 10.1109/TASE.2006.875543

8. Liu, Y.; Vignon, S. A.; Zhang, X.; **Bonvallet, P. A.**; Kahn, S. I.; Houk, K. N.; Stoddart, J. F. Dynamic Chirality in Donor-Acceptor Pretzelanes. *J. Org. Chem.* **2005**, *70*, 9334-9344. DOI: 10.1021/jo051430g

7. Liu, Y.; Flood, A. H.; **Bonvallet, P. A.**; Vignon, S. A.; Northrop, B. H.; Tseng, H.-R.; Jeppesen, J. O.; Huang, T. J.; Brough, B.; Baller, M.; Magonov, S.; Solares, S. D.; Goddard, W. A.; Ho, C.-M.; Stoddart, J. F. Linear Artificial Molecular Muscles. *J. Am. Chem. Soc.* **2005**, *127*, 9745-9759. [Highlighted by Chemical Abstracts Services as one of the five "most intriguing" publications of 3rd quarter 2005] DOI: 10.1021/ja051088p

6. Liu, Y.; **Bonvallet, P. A.**; Vignon, S. A.; Kahn, S. I.; Stoddart, J. F. Donor-Acceptor Pretzelanes and a Cyclic Bis[2]Catenane Homologue. *Angew. Chem., Int. Ed.* **2005**, *44*, 3050-3055. DOI: 10.1002/ANIE.200500041

5. Huang, T. J.; Brough, B.; Ho, C.-M.; Liu, Y.; Flood, A. H.; **Bonvallet, P. A.**; Tseng, H.-R.; Stoddart, J. F.; Baller, M.; Magonov, S. A nanomechanical device based on linear molecular motors. *Appl. Phys. Lett.* **2004**, *85*, 5391-5393. [Featured cover article] DOI: 10.1063/1.1826222

4. Swallen, S. F.; **Bonvallet, P. A.**; McMahon, R. J.; Ediger, M. D. Self-Diffusion of *tris*-Naphthylbenzene near the Glass Transition Temperature. *Phys. Rev. Lett.* **2003**, *90*, 015901/1-015901/4. DOI: 10.1103/PhysRevLett.90.015901

Peer-Reviewed Publications (contd)

3. **Bonvallet, P. A.**; Todd, E. M.;‡ Kim, Y. S.; McMahon, R. J. Access to the Naphthylcarbene Rearrangement Manifold via Isomeric Benzodiazocycloheptatrienes. *J. Org. Chem.* **2002**, *67*, 9031-9042. DOI: 10.1021/jo020304z

2. **Bonvallet, P. A.**; McMahon, R. J. Generation, Characterization, and Rearrangements of 4,5-Benzocyclohepta-1,2,4,6-tetraene. *J. Am. Chem. Soc.* **2000**, *122*, 9332-9333. DOI: 10.1021/ja001291e

1. **Bonvallet, P. A.**; McMahon, R. J. Photoequilibration of 1-Naphthylcarbene and 4,5-Benzobicyclo[4.1.0]hepta-2,4,6-triene. *J. Am. Chem. Soc.* **1999**, *121*, 10496-10503. 10.1021/ja9920157

MENTORSHIP OF UNDERGRADUATE RESEARCH

Senior Independent Study Advisees at the College of Wooster

Senior Independent Study is a yearlong self-designed research project in collaboration with a faculty mentor.

* Indicates a co-advised project
† Indicates Biochemistry & Molecular Biology major. All others are Chemistry majors.

49. Nina Catalfo ’22, Chemistry

48. Holly McAnlis ’22, Chemistry

47. Elijah Learn ’20 Ph.D. candidate, University of Delaware
Cobalt Catalyzed Hydrosilylation of Terminal Alkenes for Synthesis of Bis(trimethoxysilylethyl)benzene

46. Chloe Litts ’20 Ph.D. candidate, University of Illinois Urbana-Champaign
Exploring the Three-Dimensional Structure of Calix[4]arene-capped Azobenzenes Using VT-NMR, NOESY, and Computational Methods

45. John Nugent ’20 Applying to medical school
The Impact of Solvent Viscosity on the Cis to Trans Isomerization of Calix[4]arene Capped Azobenzene

44. Sophia Rovenko ’20 Production scientist, MilliporeSigma
Synthesis of O-nitrobenzyl Esters and Their Host-Guest Photochemistry

43. Samantha Adusumilli ’19 Dental student, Ohio State University
Don’t Go Chasing Water: Investigating the Role of Water on the Binding Strength of Dibenzo-24-Crown-8 and Dibenzylammonium Hexafluorophosphate

42. Duncan Crow ’19 Applying to medical school
Investigation of π-stacking in Swellable Organically Modified Silica using Novel Synthesis Strategies

41. Leah Scharlott ’19 Ph.D. candidate (Chemical Education), University of Iowa
Please, Be My Guest! Quantifying Association Constants Between Cationic Guest Species and Tetrapropoxycalix[4]arene as a Model for Calix[4]arene-Capped Azobenzene

40. Eva Stebel ’19 (co-advised with Paul Edmiston) Environmental chemist at Pegasus Technical Services, Cincinnati, OH
Development of Cationic Polymer-Organosilica Porous Materials for the Adsorption of Perfluoroalkyl Sulfonates and Carboxylates from Water

39. David Thomas ’19 Medicinal chemist for Cayman Chemical, Ann Arbor, MI
Evaluating Bases for the Synthesis of Dibenzo-24-Crown-8 Ether with a Methyl Viologen Template

38. Charles VanDenburgh ’19/’18 Chemist at TechLaw, Denver, CO
Investigating Reaction Conditions for the Esterification of Benzoic Acid Using Swellable Organically Modified Silica and Observed Spectrographic Shifts of Encapsulated Carbonyls

37. Austinjit Khara ’19/’18 Applying for officer school in United States Navy
Chasing the Light: Determining a Consistent Method of Device Fabrication for Single-Layered Organic Light Emitting Diodes

36. Harley Brandstadter ’17 Associate scientist, Fresenius Kabi, Raleigh, NC
Got Light? A Study of the Physical Properties of Single-Layer Organic Light-Emitting Diode Devices Using a Poly(p-phenylene vinylene) Derivative

35. Leandra Forte ’17 Ph.D. candidate, UCLA
Exploration of Palladium Catalyzed Cross-Coupling for the Synthesis of an Electroluminescent Polymer Model Compound

Senior Independent Study Advisees (contd)

* Indicates a co-advised project
† Indicates Biochemistry & Molecular Biology major. All others are Chemistry majors.

34. Kirstin Holm ’17 (**Fulbright Scholar**) Chemistry teacher at Revere High School, Cambridge, MA
Investigation of Esterification Reactions in Swellable Organically Modified Silica Towards the Synthesis of Polyethylene Terephthalate

33. Angelo Melari ’17 (**Fulbright Scholar**) Ph.D. candidate, University of Illinois Urbana-Champaign
Investigation of the Heck Reaction for the Synthesis of a Model Light-Emitting Copolymer

32. Alexander Pearson ’17 Chemist, Nalco Champion, Madison, IN
The Efficacy of Osorb as a Catalyst Replacement for Friedel-Crafts Acylation

31. Mason Mendenhall ’15* Research and Development Chemist, Ingredient Innovations International, Wooster, OH
Synthesis and Characterization of Rhenium(I) Tricarbonyl Bromide Complexes as Potential Photodynamic Therapy Agents

30. Virginia Iungerich ’15 Laboratory Assistant, Valent BioSciences, IL
Toward an Ether-Functionalized Calix[4]arene for the Improved Solubility in Polar Organic Solvents

29. Lucas Webber ’15 Research associate, Pacific Northwest National Laboratory, Eugene, OR
Development of Azobenzocrown Ethers as Selective Photoresponsive Supramolecular Hosts by way of a Novel Photoassisted Synthetic Step

28. Christine Kasprisin ’14, DPT*† Physical Therapist, United States Army
Assessment of the Biocontrol Activity of Mitsuaria Isolates through Indole-3-acetic Acid Regulation and Plant Pathogen Inhibition

27. Kyle Koemm ‘14*, J.D. Law associate, Haug Partners, New York, NY
Could Copper Cure “Le Cancer”? Research into Potential Antitumor Agents and the Art of Scientific Translation

26. John “Luke” Koniarczyk ’14 Chemist, Pfeizer
Preparation of a Diene-Functionalized Crown Ether Monomer for the Synthesis of a Conjugated Polymer

25. Dung Nguyen ’14, Pharm.D. Pharmacist (Vietnam)
Synthesis of Divinyl and Dipropenyl Monomers for ADMET Polymerization and Preliminary Synthesis of a Model Conjugated Light-Emitting Polymer

24. Andrea Steiger ’14, Ph.D. (**NSF-GRFP**) Postdoctoral research associate, Pacific Northwest National Laboratory
Synthesis of a Functionalized Calix[4]arene-Capped Azobenzene: A Supramolecular Host in Polar Organic Solvents

23. Michael Chido '13, Ph.D. IBM, Peerskill, NY
Synthesis of Monomeric Precursors for an Electroluminescent Polymer-Crown Ether: Polymerization via Acyclic Diene Metathesis

22. Lucy Moser '13 Ohio EPA, Columbus, OH
Investigating the Host-Guest Chemistry of Calixarene-Capped Azobenzene

21. Matthew Worth '13, Ph.D. Synthetic organic chemist, Madison, WI
Preparation of the Bip Ligand for Use in a Photo and Metallo-Responsive Polycatenane

20. Jaqueline Wallat '12, Ph.D. Postdoctoral researcher, University of Colorado
Synthesis of a photo-switchable ligand

19. Justin Keener '10 Director of U.S. operations, Swirltex, Houston, TX
The Optimization of a Wittig Polymerization for Use in OLEDs

18. Max Mullen '10, Ph. D. Randolph Products (aerospace and military coatings), Chicopee, MA
A Study of the Kinetic and Binding Properties of Dimeric Calix[4]arene Capped Azobenzene

17. Amy Toolis '10 Chemist, PPG Industries, Pittsburgh, PA
Dabbling with DABAL: Synthesizing 4,5-Dimethylcatechol from the Trimethylaluminum Adduct DABAL-Me_3

16. Andrew Rudawsky '09, M. D. Assistant Medical Director, Cleveland Clinic, Cleveland, OH
Continued Progress Towards the Synthesis of a Crown-Ether Substituted Polymer for Use in Organic Light Emitting Diode Displays: Synthesis of a Promising Oligomer and Optimization of Key Reactions

15. Kristen Stoltz '09, Ph.D. Senior scientist, Deciphera Pharmaceuticals, Lawrence, KS
Spectroscopic Studies of the Photoisomerization and Host-Guest Chemistry of an Azobenzene-Tethered Calixarene Dimer

14. Dr. Paul Evans '08, Ph.D. Chief Science Officer, XL Batteries, Brooklyn, NY
Synthesis of a Putative Calix[4]arene Molecular Container with an Azobenzene Tether

13. Erin Wiesenauer (Fortin) '08, Ph.D. Erin Fortin Photography, Portland, OR
Synthesis of a Luminescent Crown Ether-Containing Compound for Potential Use in an Organic Light Emitting Diode

Senior Independent Study Advisees (contd)

* Indicates a co-advised project
† Indicates Biochemistry & Molecular Biology major. All others are Chemistry majors.

12. Joel Keelor '08, Ph.D. Product Specialist, MOBILion Systems, Inc.
Synthesis of an Electrophosphorescent Fluorene Copolymer with Diphenylquinoline-Coordinated Iridium

11. Lauren Rackoff '08† Ph.D. student, University of North Carolina at Chapel Hill (Biological and Biomedical Sciences Program)
Synthesis of a β-Cyclodextrin-Benzylpenicillin Complex that is Mono-substituted with Clavulanic Acid for Use as an Antibiotic that is Protected from Inactivation by β-Lactamase Enzymes

10. Richard Giles '07, Ph.D.
Benzylic Bromination of a Key Synthetic Precursor to a Conjugated Crown Ether-Substituted Polymer

9. Brian Ondrusek '07, Ph.D. Research Chemist, Trulieve, Tallahassee, FL
Synthesis of the Monomeric Components of a Polyfluorene Copolymer with Pyrene End-caps

8. Kathryn Wieferich '07, M.D. Medical resident, University of Pittsburgh
An Investigation of the Effects of Statins on Exercise Capacity, with a Subsequent Study of the Use of Creatine as a Potential Intervention

7. Benjamin Williams '07 Operations Manager, Colorado Craft Distributors, Denver, CO
Blinded by the Light: Development of Organic Light-Emitting Diode Fabrication Techniques in the Pursuit of Examining Device Properties

6. Maria Holdcroft '06 Thermo Fisher Scientific, Cincinnati, OH
Glowing Devices: Fabrication of a Functional, Single Layer Organic Light-Emitting Diode Using a Non-Traditional Metal Cathode and Three Light-Emitting Materials

5. Nathan Little '06 Chief Strategic Officer, Sparca Software, Philadelphia, PA
Computational Investigation of the Structure, Energy and Reactivity of 9-Tryptycylcarbene

4. Dr. Josephine Sasu '06, Pharm.D. Alta Bates Summit Medical Center, Los Angeles, CA
Progress Toward the Synthesis of a Poly(para-phenylenevinylene) Derivative Substituted with a Dibenzo-30-Crown-10

3. Erica Story (Shubeck) '06† Senior R&D Technologist, J.M. Smucker (M.S. Food Science, North Carolina State 2011)
Progress Towards Synthesizing a Dimeric Calix[4]arene Molecular Container

2. Adam Milligan '05, J.D. U.S. Patent and Trademark Office
Investigating the Complexation of Benzyl Viologen and Dibenzo-30-crown-10 Ether as a Basis for the Color Tuning of a Conducting Polymer

1. Daniel Skully '05, M.D. Stanford Hospital and Clinics, San Jose, CA
Progress Toward the Synthesis of a Model Electroluminescent Polymer

Other Research Advising, Excluding Senior Independent Study

* Denotes a student who became a Senior Independent Study advisee

College of Wooster – Institutional Sherman Fairchild Grant to foster collaborative learning in the sciences

Summer 2018	**Chloe Litts '20*** *Investigation of the Photochemistry and Kinetics of a Short-Tethered Calix[4]arene-Capped Azobenzene and Exploration of the Synthesis of a Modified CCA-2* **Juliette Shea '19** *The Synthesis and Investigation of Host-Guest Interaction of Short-Tethered Calix[4]arene-capped Azobenzene* **Jayne Blinkhorn '21** *An Investigation of the Synthesis of Calix[4]arene-capped Azobenzene*

College of Wooster, Department of Physics (NSF-REU)

Summer 2020	Cancelled due to COVID-19 pandemic
Summer 2019	**Jayne Blinkhorn '21** *Investigation of Carbonyl-Containing Compounds Encapsulated in SOMS* **Brian Corbin '20** (Hiram College) *Logarithmic Expansion of Swellable Organosilica Material*
Summer 2018	**Duncan Crow '18*** *Force Exertion and Spectroscopic Properties of Swellable Organically Modified Silica* **Ryan Reffner** (Lorain County Community College) *Analysis of Force Generation and Encapsulation of Fluorophores in Swellable Organically Modified Silica*
Summer 2017	**Daniel Blaikie '18** *Spectroscopic and Optical Investigation of Organic Solutes in a Solid Matrix* **Hyuga Uchida '18** *Polymerization of Nylon 6, 6 and Polyethylene adipate (PEA) and Molecular Reactivity in Swellable Organically Modified Silica (SOMS) nanoreactors*
Summer 2016	**Tyler Branscum** (Lorain County Community College) *Analysis of Swellable Organically Modified Silica Synthesized Using Varied Temperature and Reagent Concentrations* **Zane Thornburg '17** *Characterizing the Swelling of an Organosilicon Polymer Through Computational Chemistry and Spectroscopy of the Si-O-Si Bond*

College of Wooster Sophomore Research Program

Summer 2017	Chloe Litts '20* *Studying the Synthesis of Calix[4]arene-Capped Azobenzene 3*
Summer 2013	Lavinia Rizvi *Synthesis of a Crown Ether Precursor* Lucas Webber '15* *Synthesis and Host-Guest Chemistry of Large Crown Ethers*
Summer 2011	Leah Bowers '14 *Copper-Catalyzed Isomerization of Calixarene-Capped Azobenzene*
Summer 2008	Andrew Marley '10 *Measuring the Binding Constants of Organic Cations with Crown Ethers*
Summer 2005	Richard Giles '07* *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*

Petroleum Research Fund (individual grant)

Summer 2017	Leah Scharlott '19* *An Investigation of the Synthesis of Calix[4]arene-capped Azobenzene* Juliette Shea '19 *Synthesis of Calix[4]arene-capped Azobenzene 3*
Summer 2015	Albert Darling '16 *Progress in The Synthesis of a Soluble Calixarene-Capped Azobenzene* Charles VanDenburgh '19* *Progress in The Synthesis of a Soluble Calixarene-Capped Azobenzene*
Summer 2014	Trevor Horst '16 *Copper-Catalyzed Isomerization of Azobenzene* Virginia Iungerich '15* *Progress in The Synthesis of a Soluble Calixarene-Capped Azobenzene*
Summer 2013	Virginia Iungerich '15* *Host-Guest Chemistry of Calixarene-Capped Azobenzene*
Summer 2012	Mary Nappi '13 *Binding Guest Species with a Calixarene-Capped Azobenzene*

College of Wooster – Institutional Clare Boothe Luce grant to promote retention of women in the sciences

Summer 2014	Kimberly Carter '16 *Measuring the Binding Constants of Organic Cations with Crown Ethers*
Summer 2013	Andrea Steiger '14* *Progress in The Synthesis of a Soluble Calixarene-Capped Azobenzene*
Summer 2012	Andrea Steiger '14* *Progress in The Synthesis of a Soluble Calixarene-Capped Azobenzene*

Other Research Advising, Excluding Senior Independent Study (contd)

* Denotes a student who became a Senior Independent Study advisee

College of Wooster – Institutional Howard Hughes Medical Institute grant to promote early participation in research

Summer 2012	Evan Gilchrest *Synthesis of Crown Ether Precursors*
	Joshua Houtz '16 *The Synthesis of Benzyl Diethylene Glycol and Dibenzyl Septethylene Glycol*
	Dung Nguyen '14* *Purification and Host-Guest Binding of Crown Ethers*
Summer 2011	Sara Blosser '13 *Synthesis and Host-Guest Binding of Crown Ethers*
	Virginia Iungerich '15* *Synthesis of Dibenzo-27-Crown-9 Ether*
	Lucas Webber '15* *Synthesis of Dibenzo-30-Crown-10 Ether*
Summer 2008	Andrew Rudawsky '09* *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*
	Nordia Thompson '11 *Measuring the Binding Constants of Organic Cations with Crown Ethers*
Summer 2006	Valerie Andrus '09 *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*
	David H. Thomas '07 *Measuring the Binding Constants of Organic Cations with Crown Ethers*
Summer 2005	Marisa McGinley '08 *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*
	David H. Thomas '07 *Measuring the Binding Constants of Organic Cations with Crown Ethers*

Research Corporation (individual grant)

Summer 2007	Erin Fortin '08* *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*
	Joel Keelor '08* *Fabrication of OLED devices*
Summer 2006	Erin Fortin '08* *Towards the Synthesis of a Crown-Ether-Containing Conjugated Polymer*
	Benjamin Franks '08 *Model Studies in Preparation of a Conjugated Polymer*

UCLA Bridge Program promoting partnership between research universities and community colleges

Summer 2004	Kent Miller *Viologen Capture by Polymer-Supported Crown Ethers*

University of Wisconsin-Madison

1999-2001	Eric Todd (undergraduate researcher) Synthesis of Benzocycloheptatrienylidene Precursors

PUBLISHED CONFERENCE ABSTRACTS

§ Denotes College of Wooster undergraduate co-author
‡ Denotes other undergraduate co-author

47. **Bonvallet, P. A.**; Lindner, J. F.; Corbin, B.; Crow, D.; Reffner, R.; Albon Reidl, T.; Lehman, S. Y.; Edmiston, P. L. Measuring and Modeling the Swelling Force of Swellable Organically Modified Silica (SOMS). American Chemical Society Spring Meeting, 2021 (pending).

46. Corbin, B.; Lindner, J.; **Bonvallet, P. A.** Logarithmic Expansion of Swellable Organosilica Material. American Physical Society March Meeting 2020, Denver, CO, Mar 2020 (cancelled due to COVID-19 pandemic).

45. Litts, C. A.; Shea, J. A.; **Bonvallet, P. A.** Trans/cis photoisomerization and kinetics of a calixarene-capped azobenzene. *Abstracts of Papers,* 257th National Meeting of the American Chemical Society, Orlando, FL, Mar 2019; CHED 1296.

44. Reffner, R.; **Bonvallet, P. A.**; Silvestri, R. Force generation and encapsulation of fluorophores in swellable organically modified silica. *Abstracts of Papers,* 257th National Meeting of the American Chemical Society, Orlando, FL, Mar 2019; CHED 116.

43. **Bonvallet, P. A.**; Branscum, T.; Thornburg, Z. Synthesis and Characterization of high-capacity swellable organically-modified silica. *Abstracts of Papers,* 255th National Meeting of the American Chemical Society, New Orleans, LA, Mar 2018; ORGN 472.

42. Shea, J.; Litts, C.; VanDenburgh, C.; **Bonvallet, P. A.** Synthesis of a short-tethered calixarene-capped azobenzene. *Abstracts of Papers,* 255th National Meeting of the American Chemical Society, New Orleans, LA, Mar 2018; CHED 1368.

41. Scharlott, L.; Darling, A.; **Bonvallet, P. A.** Improved synthesis of a highly soluble calix[4]arene-capped azobenzene. *Abstracts of Papers,* 255th National Meeting of the American Chemical Society, New Orleans, LA, Mar 2018; CHED 1368.

40. Thornburg, Z.;§ **Bonvallet, P. A.** Characterizing the Swelling of a Crosslinked Organosilicon Polymer. American Physical Society March Meeting 2017, New Orleans, LA, Mar 2017.

39. Branscum, T.‡ **Bonvallet, P. A.** Synthesis of Swellable Organically Modified Silica at Various Temperatures and Concentrations (*Bull. Am. Phys. Soc.* **2016**, *61*). 2016 Fall Meeting of the APS Ohio-Region Section, Bowling Green State University, Bowling Green, OH, Oct 2016.

38. Thornburg, Z.;§ **Bonvallet, P. A.** Characterizing the Swelling of a Crosslinked Organosilicon Polymer (*Bull. Am. Phys. Soc.* **2016**, *61*). 2016 Fall Meeting of the APS Ohio-Region Section, Bowling Green State University, Bowling Green, OH, Oct 2016.

37. **Bonvallet, P. A.**; Steiger, A. K.;§ VanDenburgh, C. M.;§ Darling, A. J.;§ Evans, P. J.§ Stimuli-responsive calixarene-capped azobenzene dimers: synthesis, switching, and supramolecular chemistry. *Abstracts of Papers,* 47th Central Regional Meeting of the American Chemical Society, Covington, KY, May 2016; ORGN 347. Contribution to organic chemistry symposium on the design of functional macromolecules.

36. **Bonvallet, P. A.** Synthesis, switching, and supramolecular chemistry of a calixarene-capped azobenzene: A tale of undergraduate persistence. *Abstracts of Papers,* 250th National Meeting of the American Chemical Society, Boston, MA, Aug 2015; ORGN 067.

35. **Bonvallet, P. A.**; Iungerich, V. C.;§ Steiger, A. K.;§ Horst, T. J.§ Covalent modification of a calixarene-capped azobenzene for increased solubility in polar media. *Abstracts of Papers,* 249th National Meeting of the American Chemical Society, Denver, CO, Mar 2015; ORGN 393.

34. Carter, K. A.;§ Blosser, S. L.;§ Webber, L. C.;§ Nguyen, D. P.;§ **Bonvallet, P. A.** Investigation of the non-covalent binding between benzo-crown ethers and bis(trifluoromethyl)dibenzylammonium ion. *Abstracts of Papers,* 249th National Meeting of the American Chemical Society, Denver, CO, Mar 2015; CHED 1078.

33. Iungerich, V. C.;§ **Bonvallet, P. A.** Preparation and Solubility Testing of a Lower-rim Functionalized Calix[4]arene for the Removal of Petroleum Contaminants. Society of Environmental Toxicology and Chemistry (SETAC) North America 35th Annual Meeting, Vancouver, British Colombia, Canada, Nov 2014.

32. **Bonvallet, P. A.**; Steiger, A. K.;§ Nappi, M. F.;§ Moser, L. E.;§ Iungerich, V. C.§ Enhanced control of the trans-cis equilibrium in a calixarene-capped azobenzene dimer. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; ORGN 570.

31. **Bonvallet, P. A.**; Amburgey-Peters, J. C.; Shaw, N. N. "Spectroscopy first" as evidence-based teaching in organic chemistry. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; CHED 031.

30. **Bonvallet, P. A.**; Amburgey-Peters, J. C.; Shaw, N. N.; Young-Erdos, C. L.; Collins, S. N. Using course-embedded research in the organic chemistry laboratory to promote mastery mentality and "thinking like a chemist." *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; CHED 118.

29. Iungerich, V. C.;§ Nappi, M. F.;§ Moser, L. E.;§ **Bonvallet, P. A.** Survey of cationic guests for a supramolecular calixarene-capped azobenzene container. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014.

28. Nguyen, D. P.;§ **Bonvallet, P. A.** Synthesis of a model electroluminescent polymer by acyclic diene metathesis. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014.

27. Steiger, A. K.;§ **Bonvallet, P. A.** Functionalization of a calix[4]arene-capped azobenzene supramolecular host to increase solubility in polar organic solvents. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014.

PUBLISHED CONFERENCE ABSTRACTS (contd)

26. Webber, L. C.;§ Blosser, S. L.;§ Nguyen, D. P.;§ **Bonvallet, P. A.** Improving the synthesis of benzo-24-crown-8 ether and investigating the role of benzo-functionalization in binding with dibenzylammonium guests. *Abstracts of Papers,* 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014.

25. Chido, M. T.;§ Keener, J. B.;§ **Bonvallet, P. A.** Synthesis of a crown-ether-containing conjugated polymer via acyclic diene metathesis. *Abstracts of Papers,* 245th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2013.

24. Steiger, A. K.;§ Bowers, L. M.;§ **Bonvallet, P. A.** Influence of copper(II) ion on the trans-cis isomerization of a calixarene-capped azobenzene. *Abstracts of Papers,* 245th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2013.

23. **Bonvallet, P. A.**; Nappi, Mary F.;§ Moser, L. E.§ Host-guest recognition in a photoswitchable calixarene-capped azobenzene dimer. *Abstracts of Papers,* 245th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2013.

22. **Bonvallet, P. A.**; Iungerich, V. C.;§ Webber, L. C.;§ Blosser, S. L.§ Synthesis of variously-sized benzo-crown ethers for the binding of dibenzylammonium ions. 243rd National Meeting of the American Chemical Society, San Diego, CA, Mar 2012.

21. **Bonvallet, P. A.**; Blosser, S. L.§ Influence of ring size and substituent effects in the binding of benzo-crown ethers with dibenzylammonium ions. *Abstracts of Papers,* 243rd National Meeting of the American Chemical Society, San Diego, CA, Mar 2012.

20. **Bonvallet, P. A.**; Wojtecki, Rudy J.; Rowan, Stuart J. Design of an azobenzene-containing monomer for photoresponsive metallo-supramolecular polymers. *Abstracts of Papers,* 241st National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; ORGN 483.

19. **Bonvallet, P. A.**; Mullen, M. R.;§ Evans, P. J.;§ Stoltz, K. L.;§ Story, E. N.§ Controllable isomerization and supramolecular activity of a calix[4]arene-capped azobenzene. *Abstracts of Papers,* 241st ACS National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; ORGN 678.

18. **Bonvallet, P. A.**; Amburgey-Peters, J. C. Early and often: Using NMR as the basis for understanding key concepts in organic chemistry. *Abstracts of Papers,* 241st ACS National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; CHED 021.

17. **Bonvallet, P. A.**; Stoltz, K. L.;‡ Evans, P. J.;‡ Story, E. N.‡ Photoactivity and molecular recognition of an azobenene-linked dimeric calixarene. *Abstracts of Papers*, 237th National Meeting of the American Chemical Society, Salt Lake City, UT, Mar 2009; ORGN 357.

16. **Bonvallet, P. A.**; Fortin, E. E.;‡ Giles, R. A.‡ Synthesis and supramolecular activity of a monomer containing a crown ether unit. *Abstracts of Papers*, 235th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2008.

15. Marley, A. B.;‡ **Bonvallet, P. A.** Spectroscopic characterization of light-emitting organic polymers. *Abstracts of Papers*, 235th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2008.

14. Fortin, E. E.;‡ Giles, R. A.;‡ **Bonvallet, P. A.** Synthesis and functionalization of a dibenzo-30-crown-10 derivative for incorporation into a light-emitting polymer. *Abstracts of Papers*, 235th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2008.

13. Keelor, J. D.;‡ **Bonvallet, P. A.** Progress in the fabrication of stable and efficient polymer light-emitting diodes. *Abstracts of Papers*, 235th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2008.

12. **Bonvallet, P. A.**; Amburgey-Peters, J. C. Casting away the cookbook: Bringing independent experimental design into an organic chemistry laboratory experiment. *Abstracts of Papers*, 233rd National Meeting of the American Chemical Society, Chicago, IL, Mar 25-29, 2007; CHED 390.

11. Andrus, V. M.;‡ Thomas, D. H.;‡ **Bonvallet, P. A.** Synthesis of a nitro-substituted crown ether for incorporation into a light-emitting polymer. *Abstracts of Papers*, 233rd National Meeting of the American Chemical Society, Chicago, IL, Mar 25-29, 2007; CHED 703.

10. Fortin, E. E.;‡ **Bonvallet, P. A.** Synthesis and characterization of a dimethyl dibenzo-30-crown-10 ether. *Abstracts of Papers*, 233rd National Meeting of the American Chemical Society, Chicago, IL, Mar 25-29, 2007; CHED 682.

9. Franks, B. A.;‡ **Bonvallet, P. A.** Investigation of the Horner-Wadsworth-Emmons reaction for the preparation of a conjugated polymer. *Abstracts of Papers*, 233rd National Meeting of the American Chemical Society, Chicago, IL, Mar 25-29, 2007; CHED 596.

8. Giles, R. A.;‡ Skully, D. F.;‡ **Bonvallet, P. A.** Synthesis of a conjugated photoluminescent polymer. *Abstracts of Papers*, 231st National Meeting of the American Chemical Society, Atlanta, GA, Mar 26-30, 2006; CHED 524.

7. McGinley, M. P.;‡ **Bonvallet, P. A.** Photoluminescence of supramolecular systems for a proposed organic light-emitting diode. *Abstracts of Papers*, 231st National Meeting of the American Chemical Society, Atlanta, GA, Mar 26-30, 2006; CHED 458.

6. Thomas, D. H.;‡ Milligan, A. C.;‡ **Bonvallet, P. A.** Spectroscopic analysis of supramolecular complexes for use in organic light-emitting diodes. *Abstracts of Papers*, 231st National Meeting of the American Chemical Society, Atlanta, GA, Mar 26-30, 2006; CHED 492.

5. Liu, Y.; **Bonvallet, P. A**.; Vignon, S.; Khan, S. I.; Stoddart, J. F. Synthesis, characterization and stereochemistry of pretzelanes and a cyclic bis[2]catenane. *Abstracts of Papers*, 229th National Meeting of the American Chemical Society, San Diego, CA, Mar 13-17, 2005; ORGN 875.

PUBLISHED CONFERENCE ABSTRACTS (contd)

4. Huang, T. J.; Liu, Y.; Brough, B.; Flood, A. H.; **Bonvallet, P.**; Tseng, H.-R.; Baller, M.; Magonov, S.; Stoddart, J. F.; Ho, C.-M. A Nano-Chemo-Mechanical Actuator Based on Artificial Molecular Machines. *Proceedings of the 18th IEEE International Conference on Micro Electro Mechanical Systems*, Miami, FL, Jan 30-Feb 3, 2005.

3. Flood, A. H.; Tseng, H.-R.; Liu, Y.; Wu, D.; **Bonvallet, P. A**.; Zhang, X.; Stoddart, J. F. Electrochemical switching of interlocked molecules in dynamic equilibrium. *Abstracts of Papers*, 227th National Meeting of the American Chemical Society, Anaheim, CA, Mar 28-Apr 1, 2004; ORGN 409.

2. **Bonvallet, P. A.**; Miller, K.;‡ Stoddart, J. F. Synthesis of a functionalized crown ether for attachment to a polymeric support. *Abstracts of Papers*, 227th National Meeting of the American Chemical Society, Anaheim, CA, March 28-April 1, 2004; CHED 1131.

1. **Bonvallet, P. A.**; Stoddart, J. F. Synthesis of redox switchable reverse recognition molecular muscles. *Abstracts of Papers*, 226th National Meeting of the American Chemical Society, New York, NY, Sept 7-11, 2003; ORGN 504.

OTHER PRINTED PROFESSIONAL WORK

3. Contributing author, *AP Chemistry Course and Exam Description* (College Board national curriculum), 2019.

2. **Bonvallet, P. A.**, "Matrix Isolation and Computational Investigation of Naphthylcarbene Rearrangements," Ph.D. Thesis, University of Wisconsin, **2001**.

1. **Bonvallet, P. A.**; O'Bannon, P. E., "π Selectivity and Reactivity in the Cyclopropanation of Substituted Propelladienes," *Proc. of the 10th National Conference on Undergraduate Research*, **1996**, *3*, 1690-1694.

RESEARCH PRESENTATIONS AT NATIONAL AND INTERNATIONAL MEETINGS

* Invited lecture
§ College of Wooster undergraduate co-author

29. **Bonvallet, P. A.**; Lindner, J. F.; Corbin, B.; Crow, D.; Reffner, R.; Albon Reidl, T.; Lehman, S. Y.; Edmiston, P. L. Measuring and Modeling the Swelling Force of Swellable Organically Modified Silica (SOMS). American Chemical Society Spring Meeting, Apr 2021 [virtual].

28. Corbin, B. P.; Lindner, J.; **Bonvallet, P. A.** Logarithmic Expansion of Swellable Organosilica Material. American Physical Society March Meeting, Denver, CO, March 2020. [Cancelled due to COVID-19].

27. **Bonvallet, P. A.**; Branscum, T.;§ Thornburg, Z.§ Synthesis and Characterization of high-capacity swellable organically-modified silica. 255th National Meeting of the American Chemical Society, New Orleans, LA, Mar 2018; ORGN 472.

26.* **Bonvallet, P. A.** What can an organic chemist do with swellable organically modified silica? "A Golden Age for Chemistry" Celebration for J. Fraser Stoddart, Nottingham, UK, June 2017.

25.* **Bonvallet, P. A.**; Steiger, A. K.;§ VanDenburgh, C. M.;§ Darling, A. J.;§ Evans, P. J.§ Stimuli-responsive calixarene-capped azobenzene dimers: synthesis, switching, and supramolecular chemistry. 47th Central Regional Meeting of the American Chemical Society, Covington, KY, May 2016; ORGN 347. Contribution to organic chemistry symposium on the design of functional macromolecules.

24.* **Bonvallet, P. A.** Synthesis, switching, and supramolecular chemistry of a calixarene-capped azobenzene: A tale of undergraduate persistence. 250th National Meeting of the American Chemical Society, Boston, MA, Aug 2015; ORGN 067. Contribution to 'Small Splash, Big Waves,' an ACS Organic Division symposium on research at PUIs.

23. **Bonvallet, P. A.**; Iungerich, V. C.;§ Steiger, A. K.;§ Horst, T. J.§ Covalent modification of a calixarene-capped azobenzene for increased solubility in polar media. 249th National Meeting of the American Chemical Society, Denver, CO, Mar 2015; ORGN 393.

22. **Bonvallet, P. A.**; Steiger, A. K.;§ Nappi, M. F.;§ Moser, L. E.;§ Iungerich, V. C.§ Enhanced control of the trans-cis equilibrium in a calixarene-capped azobenzene dimer. 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; ORGN 570.

21. **Bonvallet, P. A.**; Amburgey-Peters, J. C.; Shaw, N. N. "Spectroscopy first" as evidence-based teaching in organic chemistry." 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; CHED 031.

20. **Bonvallet, P. A.**; Amburgey-Peters, J. C.; Shaw, N. N.; Young-Erdos, C. L.; Collins, S. N. Using course-embedded research in the organic chemistry laboratory to promote mastery mentality and "thinking like a chemist." 247th National Meeting of the American Chemical Society, Dallas, TX, Mar 2014; CHED 118.

RESEARCH PRESENTATIONS AT NATIONAL AND INTERNATIONAL MEETINGS (contd)

19. **Bonvallet, P. A.**; Nappi, Mary F.;§ Moser, L. E.§ Host-guest recognition in a photoswitchable calixarene-capped azobenzene dimer. 245th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2013.

18. **Bonvallet, P. A.**; Iungerich, V. C.;§ Webber, L. C.;§ Blosser, S. L.§ Influence of ring size and substituent effects in the binding of benzo-crown ethers with dibenzylammonium ions. 243rd National Meeting of the American Chemical Society, San Diego, CA, Mar 2012.

17. **Bonvallet, P. A.**; Blosser, S. L.§ Influence of ring size and substituent effects in the binding of benzo-crown ethers with dibenzylammonium ions. 243rd National Meeting of the American Chemical Society, San Diego, CA, Mar 2012.

16. **Bonvallet, P. A.**; Keener, J. B.; § Fortin, E. E.;§ Sasu-Tenkoramaa, J.;§ Skully, D. F.;§ Blosser, S. L.§ Simplifying an Undergraduate Research Project on Light-Emitting Polymers Containing Crown Ethers. Gordon Research Conference on Polymers, South Hadley, MA, Jun 2011.

15. **Bonvallet, P. A.**; Wojtecki, Rudy J.; Rowan, Stuart J. Design of an azobenzene-containing monomer for photoresponsive metallo-supramolecular polymers. 241st National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; ORGN 483.

14. **Bonvallet, P. A.**; Mullen, M. R.;§ Evans, P. J.;§ Stoltz, K. L.;§ Story, E. N.§ Controllable isomerization and supramolecular activity of a calix[4]arene-capped azobenzene. *Abstracts of Papers,* 241st National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; ORGN 678.

13. **Bonvallet, P. A.**; Amburgey-Peters, J. C. Early and often: Using NMR as the basis for understanding key concepts in organic chemistry. *Abstracts of Papers,* 241st National Meeting of the American Chemical Society, Anaheim, CA, Mar 2011; CHED 021.

12.* **Bonvallet, P. A.**; Stoltz, K. L.;§ Evans, P. J.;§ Story, E. N.§ Two Out of Three Ain't Bad: Progress in the Development of a Light-Activated Calixarene Molecular Container. CCI Research Symposium, Northwestern University, Evanston, IL, May 2010.

11. **Bonvallet, P. A.**; Stoltz, K. L.;§ Evans, P. J.;§ Story, E. N.§ Photoactivity and molecular recognition of an azobenene-linked dimeric calixarene. 237th National Meeting of the American Chemical Society, Salt Lake City, UT, Mar 2009.

10. **Bonvallet, P. A.**; Fortin, E. E.;§ Giles, R. A.§ Synthesis and supramolecular activity of a monomer containing a crown ether unit. 235th National Meeting of the American Chemical Society, New Orleans, LA, Apr 2008.

9. **Bonvallet, P. A.**; Amburgey-Peters, J. C. Casting away the cookbook: Bringing independent experimental design into an organic chemistry laboratory experiment. 233rd National Meeting of the American Chemical Society, Chicago, IL, Mar 2007.

8.* **Bonvallet, P. A.** Putting Rotaxanes to Work: A Nanomechanical Device Based on Linear Molecular Motors. Norma Stoddart Memorial Symposium, Los Angeles, CA, Jun 2004.

7.* **Bonvallet, P. A.**; Stoddart, J. F. The California NanoSystems Institute: Self-Assembly of an Institute from the Bottom Up. National Nanotechnology Initiative / Department of Commerce Workshop on Regional, State, and Local Initiatives in Nanotechnology, Washington, D.C., Oct 2003.

6. **Bonvallet, P. A.**; Stoddart, J. F. Synthesis of Redox Switchable Reverse Recognition Molecular Muscles. 226th National Meeting of the American Chemical Society, New York, NY, Sept 2003

5. **Bonvallet, P. A.**; McMahon, R. J. Generation, Characterization, and Rearrangements of 4,5-Benzocyclohepta-1,2,4,6-tetraene. Reaction Mechanism Conference, Madison, WI, Jun 2000.

4. **Bonvallet, P. A.**; McMahon, R. J. Photoequilibration of 1-Naphthylcarbene and 4,5-Benzobicyclo[4.1.0]hepta-2,4,6-triene. Gordon Research Conference on Physical Organic Chemistry, Holderness, NH, Jun 1999.

3. **Bonvallet, P. A.**; McMahon, R. J. Photoequilibration of 1-Naphthylcarbene and 4,5-Benzobicyclo[4.1.0]hepta-2,4,6-triene. 36th National Organic Chemistry Symposium, Madison, WI, June 1999.

2. **Bonvallet, P. A.**; O'Bannon, P. E. π Selectivity and Reactivity in the Cyclopropanation of Substituted Propelladienes. 10th National Conference on Undergraduate Research, Asheville, NC, April 1996.

1. **Bonvallet, P. A.**; O'Bannon, P. E. π Selectivity and Reactivity in the Cyclopropanation of Substituted Propelladienes. 6th Annual Argonne Symposium for Undergraduates in Science, Engineering, and Mathematics, Argonne, IL, November 1995.

RESEARCH PRESENTATIONS AT ACADEMIC INSTITUTIONS

* Indicates invited lecture

22.* **Bonvallet, P. A.** Molecular Lego: Assembly and Function at the Nanoscale. Departmental research seminar, College of Wooster, Wooster, OH Mar 2022.

22.* **Bonvallet, P. A.** How to be an Organic Chemist. Faculty Research Luncheon, College of Wooster, Wooster, OH Nov 2018.

21.* **Bonvallet, P. A.** Design and Applications of Swellable Organically-Modified Silica. Case Western Reserve University, Cleveland, OH, Feb 2018.

20.* **Bonvallet, P. A.** What can you do with swellable organically modified silica? An organic chemist's perspective. Cleveland State University, Cleveland, OH, Apr 2017.

19.* **Bonvallet, P. A.** Capturing Cations with a Light-Activated Calixarene Container. Denison University, Granville, OH, Oct 2014.

18.* **Bonvallet, P. A.** Living Free: Controlling the capture and release of organic cations with photochemistry. Ithaca College, Ithaca, NY, Nov 2012.

17.* **Bonvallet, P. A.** Living Free: Controlling the capture and release of organic cations with photochemistry. SUNY Cortland, Cortland, NY, Nov 2012.

16. **Bonvallet, P. A.** Azobenzene: A Love Story. College of Wooster, Wooster, OH, Feb 2012.

15.* **Bonvallet, P. A.** Stimuli-Responsive Materials from Self-Assembling Polymers. Departmental seminar at The College of Wooster, Wooster, OH, Sept 2011.

14.* **Bonvallet, P. A.** To the Molecule and Beyond: Improving Materials with Supramolecular Chemistry. Otterbein College, Westerville, OH, Nov 2009.

13.* **Bonvallet, P. A.** How to Think Like an Organic Chemist. College of Wooster Alumni gathering, Lakeside, OH, Jul 2009.

12.* **Bonvallet, P. A.** Thinking Outside the Molecule: Transforming Materials with Supramolecular Chemistry. Ohio State University, Columbus, OH, Feb 2009.

11.* **Bonvallet, P. A.** Thinking Outside the Molecule: Transforming Materials with Supramolecular Chemistry. College of Wooster, Wooster, OH, Jan 2009.

10.* **Bonvallet, P. A.** Bright Lights, Big Crown Ether: Exploring Supramolecular Chemistry for Tuning a Luminescent Polymer. Denison University, Granville, OH, Sept 2008.

9.* **Bonvallet, P. A.** A 'Light' Lunch: Design and Applications of Luminescent Polymers. Faculty Research Luncheon, College of Wooster, Wooster, OH, Apr 2008.

8.* **Bonvallet, P. A.** A Supramolecular Approach to Light-Emitting Polymers. Wabash College, Crawfordsville, IN, Oct 2007.

7.* **Bonvallet, P. A.** How Many Chemists Does it Take to Change a Lightbulb? Design and Applications of Organic Light Emitting Diodes. College of Wooster Family Weekend, Wooster, OH, Oct 2007.

6.* **Bonvallet, P. A.** A Bit of "Light" Entertainment: Design and Applications of Luminescent Polymers. College of Wooster Alumni Weekend, Wooster, OH, Jun 2007.

5.* **Bonvallet, P. A.** Beginning to See the Light: Supramolecular Color Tuning in Luminescent Organic Polymers. College Student Awards Banquet, Ashland University, Ashland, OH, Apr 2006.

4.* **Bonvallet, P. A.** Putting Rotaxanes to Work: A Nanomechanical Device Based on Linear Molecular Motors. Science Round Table, Wooster, OH, Oct 2004.

3.* **Bonvallet, P. A.** Nanotechnology on the Horizon: Serious Science or High-Tech Hoopla? Pursuing Scientific Interests, Wooster, OH, Sept 2004.

2.* **Bonvallet, P. A.** The PFF Manicure: How to Manage an Academic Job Search without Masticating One's Cuticles. UCLA Preparing Future Faculty Meeting, Los Angeles, CA, Mar 2004.

1.* **Bonvallet, P. A.**; McMahon, R. J. Mothball Carbenes: Photoequilibration of $C_{11}H_8$ Species. St. Michael's College, Colchester, VT, Nov 1999.

OTHER PRESENTATIONS AND PUBLIC ACTIVITIES

* Indicates invited presentation

14.* "From Coulomb's Law to Molecular Machines" *AP Daily* online lecture for Advanced Placement Chemistry students, Aug 2020.

13.* "Don't blame the turkey if you feel snoozy; the bread and the basket share molecular formula and other Turkey Day science" *Akron Beacon Journal* article, November 25, 2015.

12.* "Faculty Focus" segment on WCWS-FM radio, discussing the chemistry of Thanksgiving. (Nov 2015)

11.* **Bonvallet, P. A.** Race and Class in Medical Care. Cross-Cultural Connections Meeting, College of Wooster, Wooster, OH, Nov 2013.

10. Contributed material to Pierce, P.; Stavnezer, A. J.; Amburgey-Peters, J. C. Developing Students as Scholars, AAC&U Network for Academic Renewal, Providence, RI, Oct 2013 (Organic Chemistry examples of course-embedded research)

9.* **Bonvallet, P. A.** Preparing for Medical School. mGluRs (Neuroscience) Conference, College of Wooster, Wooster, OH, Sept 2012.

8.* **Bonvallet, P. A.**; Constance, C.; Wright, E. Preparing for Medical School. mGluRs (Neuroscience) Conference, College of Wooster, Wooster, OH, Oct 2011.

7. Mentioned in "Listen Up, Pilgrims: Tryptophan Is Not What's Making You Sleepy," and article in *The Chronicle of Higher Education* (Nov 21, 2010) about Wooster's annual Chemistry of Thanksgiving lecture.

6.* **Bonvallet, P. A.** Thought, Word, and Deed: The Connections Between Faith and Professorship, St. James Church, Wooster, OH, Dec 2007.

5. Quoted in "The Pilgrimage Home," an article in *Inside Higher Ed* about teaching classes before Thanksgiving break (Nov 21, 2007).

4.* **Bonvallet, P. A.**; Wilson, M.; Solensky, M. Teaching the Paranormal in First Year Seminar. Science Round Table, Wooster, OH, Jan 2007.

3. **Bonvallet, P. A.**; Amburgey-Peters, J. C. The Chemistry of Thanksgiving Dinner (featured locally by *The Plain Dealer* and WKSU radio and nationally in *Chemical and Engineering News*), Wooster, OH, Nov 2006 & 2007.

2. **Bonvallet, P. A.** Is there a math and science deficit in America? Science Round Table, Wooster, OH, Feb 2006.

1. **Bonvallet, P. A.** High Tech Research. Televised faculty profile on Campus Close-Up cable television program, Feb 2006.

FUNDED EXTERNAL RESEARCH GRANTS

8. "REU Site: Physics and Chemistry Research at Wooster," (John Lindner, Susan Lehman, PIs; **Paul Bonvallet**, Laura Degroot, Cody Leary, Niklas Manz, Senior Personnel) NSF-REU, $326,132; April 2019 – March 2022.

7. "MRI: Acquisition of an NMR Spectrometer to Sustain Excellence in Undergraduate Research," (**Paul Bonvallet, Lead PI**; Judith Amburgey-Peters, Spring Knapp, Mark Snider, Sarah Sobeck co-PIs; Michael Peterson, Senior Personnel) NSF-MRI, $343,697; Jul 2016 – Jun 2019.

6. "REU Site: Physics and Chemistry Research at Wooster," (John Lindner, Susan Lehman, PIs; **Paul Bonvallet**, Niklas Manz, and Cody Leary, Senior Personnel) NSF-REU, $287,892; April 2016 – March 2019.

5. "Exploring the Controllable Uptake and Release of Pyridinium Ions with a Photoactive Calixarene-Capped Azobenzene," (**Paul Bonvallet, PI**) American Chemical Society Petroleum Research Fund, $65,000; May 2012 – Aug 2016.

4. "Design and Synthesis of a Photoresponsive Metallo-supramolecular Polymers," (**Paul Bonvallet, PI**) NSF-ROA (Research Opportunities Award), $20,748 for research leave at Case Western Reserve University in 2010-2011 academic year.

3. "MRI: Acquisition of an LC/MS/MS to Enhance Undergraduate Research and Teaching," (Melissa Schultz, Paul Edmiston, and Mark Snider, co-PIs; **Paul Bonvallet** and Catherine Fenster, Senior Personnel) National Science Foundation Major Research Instrumentation, $226,115; Aug 2008 – Jul 2011.

2. "Acquisition of an Isothermal Titration Calorimeter," (**Paul Bonvallet, Lead PI**; Mark Snider, and Donald Jacobs, co-PIs; Judith Amburgey-Peters, Senior Personnel) National Science Foundation Major Research Instrumentation (CHE-0619123), $91,090; August 2006 – July 2009.

1. May 2005: "The Synthesis, Characterization, and Supramolecular Properties of a Light-Emitting Polymer," (**Paul Bonvallet, PI**) Research Corporation Cottrell College Science Award, $36,232; May 2006 – April 2008.

OTHER (DECLINED) EXTERNAL RESEARCH PROPOSALS

11. Aug 2014: "REU Site: Cutting-Edge Science in a Close-Knit Community," (Susan Lehman and John Lindner, co-PIs; **Paul Bonvallet**, Shila Garg, and Cody Leary, Senior Personnel) NSF-REU, $290,319.

10. Aug 2013: "REU Site: Interactions between Chemicals and their Environments: From Nanoscale to Ecosystems," (Melissa Schultz and Paul Edmiston, co-PIs; **Paul Bonvallet**, Karl Feierabend, and Sarah Sobeck, Senior Personnel) NSF-REU, $273,492.

9. Feb 2013: "MRI: Acquisition of a LC/Q-ToF MS to Enhance Undergraduate Research and Teaching," (Melissa Schultz, Paul Edmiston, and Mark Snider, co-PIs; **Paul Bonvallet** and James West, Senior Personnel) NSF-MRI, $494,685.

8. Aug 2012: "REU Site: Interactions between Chemicals and their Environments: From Nanoscale to Ecosystems," (Melissa Schultz and Paul Edmiston, co-PIs; **Paul Bonvallet**, Karl Feierabend, and Sarah Sobeck, Senior Personnel) NSF-REU, $273,492.

7. Mar 2007: "Supramolecular Color Tuning of a Light-Emitting Polymer," (**Paul Bonvallet**, PI) American Chemical Society Petroleum Research Fund, $50,000.

6. Jan 2007: "MRI: Acquisition of an LC/TOF-MS to Enhance Undergraduate Research and Teaching," (Melissa Schultz, and Paul Edmiston, co-PIs; **Paul Bonvallet** and Mark Snider, Senior Personnel) National Science Foundation Major Research Instrumentation, $239,921.

5. Feb 2006: "The STaRBURSTT – Cyberenabled Chemistry Consortium – CyberTools to Support MultiInstitutional Collaborations in Organometallic NanoMaterials Research," (Co-PI) National Science Foundation Chemistry Research Instrumentation and Facilities: Cyberinfrastructure and Research Facilities, $3,497,946.

4. May 2005: "Supramolecular Color Tuning of a Light-Emitting Polymer," Paul A. Bonvallet; American Chemical Society Petroleum Research Fund (duplicative proposal that was withdrawn after funding by Research Corporation), $35,000.

3. Jan 2005: "Acquisition of an Isothermal Titration Calorimeter," (**Paul Bonvallet**, Mark Snider, and Donald Jacobs, co-PIs; Judith Amburgey-Peters, Senior Personnel); National Science Foundation / Major Research Instrumentation, $85,000.

2. May 2004: "Incorporating Large Crown Ethers into PPV-Based Polymers for Supramolecular Complexation and OLED Fabrication," (**Paul Bonvallet**, PI) Research Corporation Cottrell College Science Award, $34,030.

1. May 2004: "Encapsulation and Release of Small Organic Molecules by a Photoactive Calixarene" (**Paul Bonvallet**, PI) The Camille and Henry Dreyfus Foundation Startup Award, $20,000.

INTERNAL RESEARCH AWARDS

William H. Wilson Funds to support scientific research
Acquisition of several pieces of laboratory equipment since 2005, totaling $10,500

Howard Hughes Medical Institute (institutional grant to College of Wooster)
Support for 12 undergraduate summer research positions from 2005-2013
Acquisition of high-performance vacuum pumps for Organic Chemistry Laboratory ($4,300)
Curricular grant to explore an undergraduate course in pharmacology ($1,000)

Sophomore Research Program
Support for 10+ students to conduct research during the academic year
Support for multiple undergraduate research positions during the summer

Hewlett-Mellon Presidential Discretionary Fund for Institutional Renewal
Curriculum renewal in the Department of Chemistry ($10,000)
Support of Pre-Health Advising Program ($23,000)

PROFESSIONAL ACTIVITIES

College Board Advanced Placement Program

Positions Held

2017–present	**Chief Reader:** Establish and implement scoring practices for multiple AP Chemistry exams annually; serve on test development committee that writes questions and contributes to national curriculum; oversee scoring of 160,000+ exams nationally and internationally
2016	**Chief Reader Designate:** training for Chief Reader Position
2015–2016	**Exam Leader:** supervised the accurate, fair, and consistent scoring of alternate and international AP Chemistry Exams
2012–2014	**Question Leader:** supervised the accurate, fair, and consistent scoring of one question on an AP Chemistry Exam
2010–2011	**Table Leader:** supervised a group of Readers on the AP Chemistry Exam
2007–2009	**Reader:** scored AP Chemistry exams during the annual Reading

Leadership of AP Chemistry Presentations and Workshops

Local outreach to high school students and teachers (Wooster High School, Cleveland Central Catholic High School) about the design and scoring of Exam

Results and "lessons learned" debriefing on AP Chemistry Exam:
American Association of Chemistry Teachers, 2017-2020
AP Annual Conference, 2017-2020 (2020 cancelled due to COVID-19)
APTeach, 2020
AdvanceKentucky, 2020
ChemEd biennial conference, 2017 and 2019
Biennial Conference on Chemical Education, 2018 and 2020 (2020 cancelled due to COVID-19)

Other AP Chemistry Activities

- Three-year project on AP Chemistry curriculum re-articulation
- ~5 weeks of travel per year for Test Development Committee (designing exams) and AP Reading (scoring exams)
- Convert an in-person Reading (scoring) to an online Reading for the 2020 and 2021 exams
- Meet with visitors (college teachers, high school principals, College Board trustees and officers) during Reading to describe exam structure and scoring
- Correspondence with high school teachers about curriculum content and scoring practices

Professional Activities – External

Professional Research Review (Ongoing)

Regular reviewer of research proposals submitted to:

- ACS Petroleum Research Fund
- Research Corporation
- National Science Foundation
  - Course, Curriculum, and Laboratory Improvement (CCLI), including service as Panel Chair
  - Major Research Instrumentation (MRI)
  - Materials Research Science and Engineering Centers (MRSEC)
  - Partnerships for Research and Education in Materials (PREM)

Regular reviewer of manuscripts for:

ACS Macro Letters
ACS Symposium Series (books)
Advanced Materials
Angewandte Chemie
Chemical Communications, Chemistry – A European Journal
Chemical Science
Chemistry of Materials
ChemPhysChem
Journal of the American Chemical Society
Journal of Organic Chemistry
Journal of Physical Chemistry
Organic Letters
Tetrahedron Letters

One-Time Activities

External reviewer for faculty tenure / promotion decisions at three PUIs

Session chair, National Meeting of the American Chemical Society (Mar 2014)

Technical editor: *Organic Chemistry for Dummies* online version (Dec 2014)
Chemistry Workbook for Dummies (May 2015)

Participant, CUR Dialogues Conference (Feb 2013)

Textbook Manuscript Reviewer
Evaluated portions of an organic chemistry textbook (Pearson, 2019) and a general chemistry textbook (Pearson, 2010)

Participant, Proposal-Writing Workshops
2009: On-campus workshop with Thomas Blackburn (formerly with PRF)
2008: American Chemical Society Petroleum Research Fund, Washington DC

GLCA Academic Leadership and Innovation (GALI) Institute
Three-day workshop, sponsored by the Great Lakes Colleges Association, for faculty to explore issues in academic governance and decision-making at liberal arts colleges (Feb 2008)

External Reviewer for Undergraduate Research Projects
Kenyon College 2007

Workshop Participant, *Materials Science and Nanotechnology for Chemists*, Beloit College, WI (2005)

Professional Activities – Internal

Ongoing Involvement

Phi Beta Kappa (Kappa of Ohio Chapter)
Past service as President, Vice President, and Secretary

Academic Registration and Creative Horizons (ARCH) Summer Advising (2012-present)

Science Round Table, College of Wooster
Informal gathering of science faculty to discuss research and teaching in science. Have served as coordinator.

Teaching Matters, College of Wooster
Informal gathering of faculty to discuss teaching strategies and current pedagogy.

Campus Committee Service (Past)

Chair, Pre-Health Advising Committee (2007-2015)

- Interviewed and wrote committee letter for applicants to medical and other health-related professional fields
- advised students on course selection, admissions strategies, and internship opportunities
- met or spoke with prospective students interested in medicine
- organized workshops and internship opportunities for Pre-Health students

Committee to redesign course evaluations
Committee to evaluate transfer credit policies
Committee on Conference with Trustees (2011-2015, two years as Chair)
Biochemistry and Molecular Biology Curriculum Committee
Human Subjects Research Committee
Honorary Degrees Committee
Upperclass Programs Committee
Writing Committee / Writing Advisory Board

One-Time and Past Activities

Chair, Department of Chemistry, The College of Wooster (2016-2020)

Faculty search committees to staff various positions in Department of Chemistry, Department of Communication, and Science Librarian. Search committee chair on many occasions.

Departmental Liaison with various offices including Admissions, Libraries, and I.T.

Critical Writing Assessment
Faculty panel to establish and implement an assessment rubric for student writing samples (May 2009)

Participant, Workshop on Entrepreneurship
Workshop, sponsored by the College of Wooster Center for Entrepreneurship, for faculty interested in pedagogical activities, new courses, and novel strategies centering around entrepreneurship (Jan 2009)

Faculty advisor to Chemistry Club (2005-2009)
Coordinated speakers, fundraising, outreach presentations in local schools, and preparation of annual report to the American Chemical Society national organization.

CNSI Outreach Committee, California NanoSystems Institute, Los Angeles (2002-2003)
Developed experiments for Los Angeles high school teachers to incorporate the principles of nanoscience into their classes. Featured in *Chemical and Engineering News.*

Participant, Preparing Future Faculty Seminar, University of California, Los Angeles (2002-2003)

Professional Activities – Teaching and Pedagogical Development

Courses Taught Regularly
General Chemistry I
General Chemistry II (+ Lab)
Organic Chemistry I (+ Lab)
Organic Chemistry II (+ Lab)
Advanced Organic Chemistry
Introduction to Independent Study (seminar for development of Senior Independent Study research project)
Senior Independent Study (yearlong self-designed research project for every senior)

Other Courses

Environmental Chemistry (once, on a team-taught basis)

First-Year Seminar in Critical Inquiry (reading, writing, and evaluating different viewpoints and disciplinary perspectives)

Course topics:	2008	Skepticism and Belief of the Paranormal
	2012	Alcohol, Tobacco, and Firearms
	2018	Winning and Losing

Innovations in the Classroom

Ongoing support and use of the STEM Zone, a center for collaboration and drop-in assistance for students enrolled in introductory-level science and mathematics courses.

"Semi-flipped" approach to classroom instruction – students complete reading assignment and solve online homework problems before class. Class time is spent on illustrative examples, clarification, and application of concepts.

Peer learning activities – students collaboratively solve problems in small groups.

Early introduction of spectroscopy in Organic Chemistry I – students can use IR/NMR in the laboratory and use spectroscopic evidence to support foundational concepts.

Open-ended experiments in Organic Chemistry I Lab – students perform multi-week projects rather than "cookbook" experiments. They get to decide timeline and plans for implementation.

Course-embedded research projects in Organic Chemistry II Lab – in first half of the semester, students create materials that will be used in faculty research. In the second half, students design and carry out their own multi-step synthesis.