

# Frank A. Leibfarth, Ph.D.

## Personal

Caudill Laboratory 239  
Department of Chemistry  
University of North Carolina at Chapel Hill  
Chapel Hill, NC 27599-3290

Phone: 919.962.3418  
Email: FrankL@email.unc.edu  
Web: www.frankleibfarth.com

## Education

University of California, Santa Barbara 2008-2013  
Ph.D., Chemistry and Biochemistry, Advisor: Professor Craig J. Hawker  
University of South Dakota 2003-2008  
B.A. Chemistry and Physics, *Summa Cum Laude*

## Professional Experience

Associate Professor 2022–present  
Department of Chemistry, University of North Carolina Chapel Hill  
Assistant Professor 2016-2022  
Department of Chemistry, University of North Carolina Chapel Hill  
Postdoctoral Fellow 2013–2016  
Massachusetts Institute of Technology, Advisor: Professor Timothy F. Jamison

## Honors and Awards

University of South Dakota Spring Commencement Speaker 2022  
Journal of Polymer Science Innovation Award, ACS PMSE Division 2022  
Thieme Chemistry Journal Award 2022  
UNC Winter Commencement Speaker 2021  
Named one of the "Brilliant 10" early career scientists by *Popular Science* 2021  
UNC Tanner Award for Excellence in Undergraduate Teaching 2021  
Fellow, ACS POLY Division 2021  
NIH Maximizing Investigators' Research Award (MIRA R35) 2021  
Camille Dreyfus Teacher–Scholar Award 2020  
Sloan Research Fellowship in Chemistry 2020  
Cottrell Scholar Award 2020  
Herman F. Mark Young Scholar Award, ACS POLY division 2020  
Beckman Young Investigator 2019  
Named among "Talented 12" by *Chemical & Engineering News* 2019  
NSF CAREER Award 2019  
Army Research Office Young Investigator Program 2019  
PMSE Young Investigator Award 2019  
Air Force Office of Scientific Research Young Investigator Program 2018  
3M Non-tenured Faculty Award 2017  
Emerging Leader Award, University of South Dakota Alumni Association 2017  
TEDx Speaker at University of South Dakota TEDx event 2015  
NSF Science, Engineering & Education for Sustainability (SEES) Fellowship 2013-2016  
NIH Ruth L. Kirschstein NRSA Postdoctoral Fellowship (deferred) 2013

DSM Polymer Technology Award, American Chemical Society	2012
UCSB MRL Outstanding Service to Education Programs Award	2012
NSF Graduate Research Fellowship	2008-2013
DoD National Defense Science & Engineering Graduate Fellowship	2008-2013
Chancellors Fellowship, UC Santa Barbara	2008-2013
Undergraduate thesis with High Distinction, USD	2008
USA Today College Academic All-Star First Team (20 selected nationally)	2007
First team <i>ESPN The Magazine</i> Academic All-America Football Team (twice selected)	2006, 2007
Barry M. Goldwater Scholarship	2006
Eagle Scout	2003

## Bibliography

### Refereed publications from UNC Chapel Hill (\*indicates corresponding author)

- 47) I. M. Manning, N. G. Chew, H. Macdonald, K. E. Miller, M. J. Strynar, O. Coronell\*, & F. A. Leibfarth\*. Hydrolytically stable Ionic Fluorogels for high-performance PFAS remediation from natural water. *Submitted*.
- 46) N. G. Taylor, M. H. Reis, T. P. Varner, J. L. Rapp, A. Sarabia & F. A. Leibfarth\*. A Dual Initiator Approach for Oxygen Tolerant RAFT Polymerization. *Submitted*.
- 45) C. C. Sorensen & F. A. Leibfarth\*. Stereoselective Helix-Sense-Selective Cationic Polymerization of *N*-vinylcarbazole using Chiral Lewis acid Catalysis. *J. Am. Chem. Soc.* **2022**, *144*, 8487-8492. [[doi](#)]
- 44) C. Jehanno, J. W. Alty, S. De Meester, A. P. Dove, E. Y. -X. Chen, **F. A. Leibfarth\*** & H. Sardon\*. Upcycling Commodity Polymers: Critical Advances and Future Opportunities. *Nature* **2022**, *603*, 803-814. [[doi](#)]
  - Invited Review
- 43) T. J. Fazekas, J. W. Alty, A. S. Miller, E. K. Neidhart, **F. A. Leibfarth\*** & E. J. Alexanian\*. A General Strategy for the Diversification of Aliphatic C–H Bonds via Radical Chain Transfer. *Science* **2022**, *375*, 545-550.
  - Highlighted in *Chemical & Engineering News* ([link](#)) as part of ACS National Meeting coverage
- 42) P. C. Knutson, A. J. Teator, T. P. Varner, C. T. Kozuszek, P. E. Jacky & **F. A. Leibfarth\***. Brønsted Acid-Catalyzed Stereoselective Polymerization of Vinyl Ethers. *J. Am. Chem. Soc.* **2021**, *143*, 16388-16393. [[doi](#)]
- 41) M. Reis, F. Gusov, N. G. Taylor, S. H. Chung, Y. Z. Lee, O. Isayev\* & **F. A. Leibfarth\***. Machine Learning-Guided Discovery of <sup>19</sup>F MRI Agents Enabled by Automated Copolymer Synthesis. *J. Am. Chem. Soc.* **2021**, *143*, 17677-17689. [[doi](#)]
- 40) A. J. Teator, T. P. Varner, P. C. Knutson, C. C. Sorensen & **F. A. Leibfarth\***. 100th Anniversary of Macromolecular Science Viewpoint: The Past, Present, and Future of Stereoselective Vinyl Polymerization. *ACS Macro Letters*, **2020**, *9*, 1638-1654. [[doi](#)]
  - Invited Review
- 39) T. P. Varner, A. J. Teator, Y. Reddi, P. E. Jacky, C. J. Cramer & **F. A. Leibfarth\***. Mechanistic Insight into the Stereoselective Polymerization of Vinyl Ethers. *J. Am. Chem. Soc.* **2020**, *142*, 17175-17186. [[doi](#)]
- 38) Y. Cong, M. Vatankhah-Varnosfaderani, V. Karimkhani, A. N. Keith, **F. A. Leibfarth**, M. M. Martinez, K. Matyjaszewski\* & S. S. Sheiko\*. Understanding the synthesis of linear-bottlebrush-linear block copolymers: towards elastomers with well-defined mechanical properties. *Macromolecules* **2020**, *53*, 8324-8332. [[doi](#)]

- 37) N. G. Taylor, S. H. Chung, A. Kwansa, R. R. Johnson III, A. J. Teator, K. M. Koshlap, Y. G. Yingling, Y. Z. Lee\*, & **F. A. Leibfarth\***. Partially Fluorinated Copolymers as Oxygen Sensitive <sup>19</sup>F MRI Agents. *Chem Eur. J.* **2020**, *26*, 9982-9990. [doi]
- 36) E. Kumarasamy, I. M. Manning, L. B. Collins, O. Coronell\*, & **F. A. Leibfarth\***. Ionic Fluorogels for Remediation of Per- and Polyfluorinated Alkyl Substances from Water. *ACS Central Science*, **2020**, *6*, 487-492. [doi]
- Highlighted by *Chemical & Engineering News* (link)
  - Highlighted as Journal Cover (link)
- 35) S. E. Lewis, B. E. Wilhelmy Jr. & **F. A. Leibfarth\*** Organocatalytic C–H Fluoroalkylation of Commodity Polymers. *Polym. Chem.* **2020**, *11*, 4914-4919. [doi]
- 34) M. H. Reis, **F. A. Leibfarth\***, & L. Pitet\*. Polymerizations in Flow: Opportunities for Well-Defined Architecturally and Compositionally Complex Polymeric Materials. *ACS Macro Lett.* **2020**, *9*, 123-133. [doi]
- Invited Review
  - Most read article in *ACS Macro Lett.* in January 2020
- 33) A. J. Teator, T. P. Varner, P. Jackey, K. Sheyko, & **F. A. Leibfarth\***. Polar Thermoplastics with Tunable Physical Properties Enabled by the Stereoselective Copolymerization of Vinyl Ethers. *ACS Macro Lett.* **2019**, *8*, 1559-1563. [doi]
- Highlighted as Journal Cover
- 32) J. B. Williamson, C. G. Na, R. R. Johnson III, W. F. M. Daniel, E. J. Alexanian\*, & **F. A. Leibfarth\***. Chemo- and Regioselective Functionalization of Isotactic Polypropylene: A Mechanistic and Structure–Property Study. *J. Am. Chem. Soc.* **2019**, *141*, 12815-12823. [doi]
- 31) S. E. Lewis, B. E. Wilhelmy Jr. & **F. A. Leibfarth\***. Upcycling Aromatic Polymers through C–H Functionalization. *Chem. Sci.*, **2019**, *10*, 6270-6277. [doi]
- Highlighted by *Chemistry World* (link)
  - Chosen as the *Chemical Science* “Pick of the Week” & *Chemical Science* Hot Article
- 30) A. J. Teator, **F. A. Leibfarth\***. Catalyst-Controlled Stereoselective Cationic Polymerization of Vinyl Ethers. *Science*, **2019**, *363*, 1439-1443. [doi]
- Highlighted by *Science* (**2019**, *363*, 6434; link)
  - Highlighted by *Nature Highlights* (link)
  - Highlighted by *Chemical & Engineering News* (link)
  - Named one of the “Syntheses of 2019” by *Chemical & Engineering News*
- 29) M. H. Reis, T. P. Varner, & **F. A. Leibfarth\***. The Influence of Residence Time Distributions on Continuous-flow Polymerization. *Macromolecules* **2019**, *52*, 3551-3557. [doi]
- 28) J. B. Williamson; S. E. Lewis; R. R. Johnson III; I. M. Manning; **F. A. Leibfarth\***. C–H Functionalization of Commodity Polymers. *Angew. Chem. Int. Ed.* **2019**, *58*, 8654-8668. [doi]
- Invited Review
- 27) J. B. Williamson; W. L. Czaplyski; E. J. Alexanian\* & **F. A. Leibfarth\*** Regioselective C–H Xanthylation as a Platform for Polyolefin Functionalization. *Angew. Chem. Int. Ed.* **2019**, *57*, 6261-6265. [doi]
- 26) M. H. Reis, C. L. G. Davidson IV & **F. A. Leibfarth\*** Continuous-flow Chemistry for the Determination of Comonomer Reactivity Ratios. *Polym. Chem.* **2018**, *9*, 1728-1734. [doi]

### Refereed publications prior to UNC Chapel Hill

- 25) **Leibfarth, F. A.**; Russell, M. G.; Langley, D. M.; Seo, H.; Kelly, L. P.; Carney, D. W.; Sello, J. K.;

- Jamison, T. F.\* Continuous-flow chemistry in Undergraduate Education: Sustainable Conversion of Reclaimed Vegetable Oil into Biodiesel. *J. Chem. Ed.*, **2018**, *95*, 1371-1375. [\[doi\]](#)
- 24) Wicker, A. M.; **Leibfarth, F. A.**; Jamison, T. F.\* Flow-IEG Enables Programmable Thermodynamic Properties in Sequence-Defined Synthetic Polymers. *Polym. Chem.* **2017**, *8*, 5786-5794. [\[doi\]](#)
- 23) **Leibfarth, F. A.**; Johnson, J. A.; Jamison, T. F.\* Flow-IEG: Scalable Synthesis of Sequence and Architecturally Defined Unimolecular Macromolecules. *Proc. Natl. Acad. Sci. USA*, **2015**, *112*, 10617-10622. [\[doi\]](#)
- Highlighted by *Chemical & Engineering News* (vol. 93 (33): August 2015 p. 5) [\(link\)](#)
- 22) Barnes, J. C.; Ehrlich, D. J. C.; Gao, A. X.; **Leibfarth, F. A.**; Jiang, Y.; Zhou, E.; Jamison, T. F.; Johnson, J. A.\* Efficient Synthesis of Oligotriazoles with Absolute Control over Mass, Sequence, and Stereochemistry. *Nature Chem.* **2015**, *7*, 810-815. [\[doi\]](#)
- Highlighted by *Chemistry World Magazine* [\(link\)](#)
- 21) Helmy, S.; Oh, S.; **Leibfarth, F. A.**; Hawker, C. J.; Read de Alaniz, J.\*; Design and Synthesis of Donor-Acceptor Stenhouse Adducts: A Visible Light Photoswitch Derived from Furfural. *J. Org. Chem.* **2014**, *79*, 11316-11329. [\[doi\]](#)
- 20) Soh, S. S.; Lee, B. F.; **Leibfarth, F. A.**; Robb, M. R.; Lynd, N. A.; Eisenstein, M. E.; Hawker, C. J.\*; Soh, H. T.\* Synthetic aptamer-polymer hybrid constructs for programmed drug delivery into specific target cells. *J. Am. Chem. Soc.* **2014**, *136*, 15010-15015. [\[doi\]](#)
- 19) Helmy, S.; **Leibfarth, F. A.**; Oh, S.; Poelma, J. E.; Hawker, C. J.\*; Read de Alaniz, J.\*; Photoswitching using visible light: A new class of organic photochromic molecules. *J. Am. Chem. Soc.* **2014**, *136*, 8169-8172. [\[doi\]](#)
- 18) Groote, R.; Szyja, B. M.; **Leibfarth, F. A.**; Hawker, C. J.\*; Doltsinis, N. L.\*; Sijbesma, R. P.\* Strain induced strengthening of the weakest link: The importance of intermediate geometry for the outcome of mechanochemical reactions. *Macromolecules*, **2014**, *47*, 1187-1192. [\[doi\]](#)
- 17) **Leibfarth F. A.**; Hawker, C. J.\* The Emerging Utility of Ketenes in Polymer Chemistry, *J. Polym. Sci. A: Polym. Chem.* **2013**, *51*, 3769-3782. [\[doi\]](#) (Highlight)
- Highlighted by *Materials views website* [\(link\)](#)
- 16) **Leibfarth, F. A.**; Mattson, K. M.; Fors, B. P.; Collins, H. A.; Hawker, C. J.\* External Regulation of Controlled Polymerizations, *Angew. Chem. Int. Ed.*, **2013**, *52*, 199-210. [\[doi\]](#) (Minireview)
- 15) Jung, H.; **Leibfarth, F. A.**; Woo, S.; Lee, S.; Kang, M.; Moon, B.; Hawker, C. J.\*; Bang, J.\* Efficient Surface Neutralization and Enhanced Surface Adhesion through Ketene-Mediated Crosslinking and Functionalization. *Adv. Funct. Mat.*, **2012**, *23*, 1597-1602. [\[doi\]](#)
- 14) Burke, D. J.; Kawauchi, T.; Kade, M. J.; **Leibfarth, F. A.**; McDearmon, B.; Wolffs, M.; Kierstead, P. H.; Moon, B.\*; Hawker, C. J.\* Ketene-based Route to Rigid Cyclobutanediol Monomers for the Replacement of BPA in High Performance Polyesters. *ACS Macro Letters*, **2012**, *1*, 1228-1232. [\[doi\]](#)
- 13) **Leibfarth, F. A.\***; Moreno, N.; Hawker, A.; Shand, J. D. Transforming Polylactide into Value Added Materials. *J. Polym. Sci. A: Polym. Chem.* **2012**, *50*, 4814-4822. [\[doi\]](#)
- Highlighted in *UCSB Convergence Magazine* [\(link\)](#)
  - Highlighted as journal cover image [\(link\)](#)
- 12) Lee, B.; Wolffs, M.; Delaney, K.; Sprafke, J.; **Leibfarth, F. A.**; Hawker, C. J.\*; Lynd, N. A.\* Reactivity Ratios and Mechanistic Insight for Anionic Ring-Opening Polymerization of Epoxides. *Macromolecules*, **2012**, *45*, 3722-3731. [\[doi\]](#)
- 11) **Leibfarth, F. A.**; Wolffs, M.; Campos, L. M.; Delany, K.; Treat, N.; Kade, M. J.; Moon, B.\*; Hawker, C. J.\* Low Temperature Ketene Formation in Materials Chemistry through Molecular Engineering.

*Chem. Sci.* **2012**, *3*, 766-771. [[doi](#)]

- 10) Spruell, J. M.; Wolffs, M.; **Leibfarth, F. A.**; Stahl, B. C.; Heo, J.; Connal, L. A.; Hu, J.; Hawker, C. J.\* Reactive, Multifunctional Polymer Films through Thermal Cross-linking of Orthogonal Click Groups. *J. Am. Chem. Soc.* **2011**, *133*, 16698-16706. [[doi](#)]
- 9) **Leibfarth, F. A.**; Hawker, C. J.\* Mechanically Throwing a Reaction into Reverse. *Science* **2011**, *333*, 1582-1583. [[doi](#)] (Invited perspective on a manuscript in the same journal).
- 8) **Leibfarth, F. A.\***; Vermaak, N.\* Hope for Graduate Student Childbirth Policies. *Science* **2011**, *333*, 1380. [[doi](#)]
- 7) Miyamura, Y.; Park, C.; Kinbara, K.; **Leibfarth, F. A.**; Hawker, C. J.\*; Aida, T.\* Controlling Volume Shrinkage in Soft Lithography through Heat-Induced Cross-Linking of Patterned Nanofibers. *J. Am. Chem. Soc.* **2011**, *133*, 2840-2843. [[doi](#)]
- 6) **Leibfarth, F. A.**; Schneider, Y.; Lynd, N. A.; Schultz, A.; Moon, B.; Kramer, E. J.; Bazan, G. C.\*; Hawker, C. J.\* Ketene Functionalized Polyethylene: Control of Cross-Link Density and Material Properties. *J. Am. Chem. Soc.* **2010**, *132*, 14706-14709. [[doi](#)]
- 5) **Leibfarth, F. A.**; Kang, M.; Ham, M.; Kim, J.; Campos, L. M.; Gupta, N.; Moon, B.; Hawker, C. J.\* A Facile Route to Ketene Functionalized Polymers for Broad Materials Applications. *Nature Chem.* **2010**, *2*, 207-212. [[doi](#)]
  - Highlighted in *Nature Chemistry*, (*Nature Chemistry* **2010**, *2*, 164-165).
  - Highlighted in *Chemistry World*, "Ketene comes in from the cold" (vol. 7, March 2010).
  - Highlighted in *C&E News*, "Versatile Ketene Polymers" (vol. 88 (6), February 2010, p. 49).
- 4) Nederberg, F.; Lohmeijer, B. G. G.; **Leibfarth, F.**; Pratt, R. C.; Choi, J.; Waymouth, R. M.\*; Hedrick, J. L.\* Organocatalytic Ring Opening Polymerization of Trimethylene Carbonate. *Biomacromolecules* **2007**, *8*, 153-160. [[doi](#)]
- 3) Lohmeijer, B. G. G.; Pratt, R. C.; **Leibfarth, F.**; Logan, J. W.; Long, D. A.; Dove, A. P.; Nederberg, F.; Choi, J.; Waymouth, R. M.\*; Hedrick, J. L.\* Guanidine and Amidine Organocatalysts for Ring-Opening Polymerization of Cyclic Esters, *Macromolecules* **2006**, *39*, 8574-8583. [[doi](#)]
- 2) Lohmeijer, B. G. G.; Dubois, G.; **Leibfarth, F.**; Pratt, R. C.; Nederberg, F.; Nelson, A.; Waymouth, R. M.; Wade, C.; Hedrick, J. L. Organocatalytic Living Ring-Opening Polymerization of Cyclic Carbosiloxanes. *Org. Lett.* **2006**, *8*, 4683-4686. [[doi](#)]
- 1) Guo, X; Myers, M; Xiao, S.; Lefenfeld, M.; Steiner, R.; Tulevski, G. S.; Tang, J.; Baumert, J.; **Leibfarth, F.**; Yardley, J. T.; Steigerwald, M. L.; Kim, P.; Nuckolls, C.\*; Chemoresponsive Monolayer Transistors. *Proc. Natl. Acad. Sci.* **2006**, *103*, 11452-11456. [[doi](#)]

### Intellectual Property at UNC Chapel Hill

- 6) Leibfarth, F. A.; Knutson, P. C.; Teator, A. J. BINOL-derived Bronsted Acid compounds as vinyl ether polymerization catalysts. U. S. Provisional Patent application #63/249,880
- 5) Leibfarth, F. A.; Alexanian, E. J. Reagents and Methods for Aliphatic Carbon-Hydrogen Bond Functionalization. U. S. Provisional Patent application #63/188,215
- 4) Manning, I. M.; Leibfarth, F. A. Fluoroether vinyl ether copolymer ionic fluorogels and methods of use thereof. U.S. Provisional patent application #63/140,306
- 3) Kumarasamy, E.; Manning, I. M.; Leibfarth, F. A. Polymers, Fluoinated Ionic Polymer Networks, and Methods Relating Thereto. International PCT application # PCT/US2020/047365
- 2) Teator, A. J.; Leibfarth, F. A. Polyvinyl ethers and methods related thereto. Pending U.S. patent #17/269,247
- 1) Williamson, J. B.; Czaplyski, W. L.; Alexanian, E. J.; Leibfarth, F. A. Regioselective xanthylation as a platform technology for polyolefin functionalization. Pending U.S. patent #16/753,390

## Invited Highlights and Commentaries

- 2) M. A. Borden & F. A. Leibfarth. From Disposable Diapers to Adhesives. *Nature Chem.* **2021**, *13*, 930-932.
- 1) F. A. Leibfarth, B. A. Helms, E. Pentzer, D. A. Singleton & J. Lutkenhaus. When is an Article 'Good' Enough? *Trends in Chem.* **2020**, *2*, 278-279.

## Invited Oral Presentations at Meetings and Conferences

- 22) Polyolefin Upcycling through C–H Functionalization. **World Plastics Summit**, Monaco, March 2022 (in person seminar)
- 21) Ionic Fluorogels for the Remediation of PFAS from Water. **ACS National Meeting**, San Diego, CA, March 2022 (Virtual Seminar)
- 20) Teaching Polymer Synthesis using the CREATE Method. **ACS National Meeting**, San Diego, CA, March 2022 (Virtual Seminar)
- 19) Stereoselective Cationic Polymerization of Vinyl Ethers. **ACS National Meeting**, Atlanta, GA, August 2021
- 18) C–H Functionalization of Polyolefins, **ACS National Meeting**, San Francisco, CA, April 2021 (Virtual Seminar)
- 17) Stereoselective Cationic Polymerization, **ACS National Meeting**, San Francisco, CA, April 2021 (Virtual Seminar)
- 16) Stereoselective Cationic Polymerization, **ACS National Meeting**, Virtual, August 2020 (Herman Mark Young Investigator Award Lecture)
- 15) Controlling the Stereochemistry of Functional Polymers. **ACS National Meeting**, San Diego, CA, August 2019. (C&E News Talented 12 Symposium)
- 14) Stereocontrolled Cationic Polymerization using BINOL-derived Chiral Counterions. **ACS National Meeting**, San Diego, CA, August 2019. (PMSE Young Investigator Symposium)
- 13) Ionic Fluorogel Resins for PFAS Remediation from Water. **ACS National Meeting**, San Diego, CA, August 2019.
- 12) Evolution of Material Function through Continuous-Flow Chemistry. **ACS National Meeting**, San Diego, CA, August 2019.
- 11) Modern Approaches to Polar Polyolefins. **9th Pacific Symposium on Radical Chemistry**, Pacific Grove, CA, June 2019.
- 10) The Influence of Laminar Flow on Dispersity in Continuous Flow Polymerizations. **ACS National Meeting**, Orlando, FL, March 2019.
- 9) C–H Functionalization of Polyolefins. **ACS National Meeting**, Orlando, FL, March 2019
- 8) Evolution of Material Function through Continuous-Flow Chemistry. **2018 Flow Chemistry Congress**, Miami, FL, November 2018.
- 7) C–H Fluorination of Aromatic Polymers using Electrophilic Radicals. **ACS Fluoropolymers Workshop**, Denver, CO, June 2018.
- 6) Stereocontrolled cationic polymerization of vinyl ethers through asymmetric ion-pairing catalysis. **4<sup>th</sup> Fusion Functional Materials Conference**, Nassau, Bahamas, June 2018.
- 5) New Approaches to Polar Polyolefins. **10<sup>th</sup> Annual Triangle Soft Matter Workshop**, North Carolina State University, Raleigh, NC
- 4) C–H Xanthylation as a Platform Technology for Polyolefin Functionalization. **ACS National Meeting**,

New Orleans, LA, March 2018.

- 3) Partially fluorinated polymers for spatiotemporal mapping of tissue oxygenation **ACS National Meeting**, New Orleans, LA, March 2018.
- 2) C–H Xanthylation as a Platform Technology for Polyolefin Functionalization. **2017 Southeast Regional ACS Meeting**, Charlotte, NC, November 2017
- 1) Late-Stage Diversification of Commodity Polymers: Perfluoroalkylation of Aromatic materials **ACS National Meeting**, Washington, D. C., August 2017.

#### **Invited Lectures at Universities, Colleges, Industries, or Research Laboratories**

- 27) Stereoselective Cationic Polymerization, **U.S. Army Combat Capabilities Development Command**, June 2022, Natick, MD (virtual seminar)
- 26) Upcycling Polyolefins through C–H Functionalization, **McMaster University**, June 2022, Hamilton, Ontario, Canada (virtual seminar)
- 25) Upcycling Polyolefins through C–H Functionalization, **Sandia National Laboratories**, May 2022, Albuquerque, NM (Virtual Seminar)
- 24) Upcycling Polyolefins through C–H Functionalization, **Kraton Corporation**, May 2022, Houston, TX (Virtual Seminar)
- 23) Modern Approaches to Polar Polyolefins, **Snapdragon Chemistry Inc.**, April 2022, Boston, MA (In person seminar)
- 26) Modern Approaches to Polar Polyolefins, **Boston College**, Chemistry Department; Boston, MA, April 2022 (In person seminar)
- 25) Modern Approaches to Polar Polyolefins, **University of Wisconsin**, Chemistry Department; Madison, WI, April 2022 (In person seminar)
- 24) Modern Approaches to Polar Polyolefins, **Colorado State University**, Chemistry Department; Fort Collins, CO, April 2022 (In person seminar)
- 23) Modern Approaches to Polar Polyolefins, **University of Rochester**, Chemistry Department; Rochester, NY, March 2022 (In person seminar)
- 22) Modern Approaches to Polar Polyolefins, **Northwestern University**, Chemistry Department; Chicago, IL, February 2022 (In person seminar)
- 21) Modern Approaches to Polar Polyolefins, **Virginia Tech**, Chemistry Department; Blacksburg, VA, November 2021 (In person seminar)
- 20) Modern Approaches to Polar Polyolefins, **University of South Mississippi**, School of Polymer Science & Engineering; Hattiesburg, MS, October 2021 (Virtual seminar)
- 19) Modern Approaches to Polar Polyolefins, **UMass Amherst**, Department of Polymer Science & Engineering; Amherst, MA, October 2021 (In person seminar)
- 18) Modern Approaches to Polar Polyolefins, **University of Illinois Urbana-Champaign**, Chemistry Department; Champaign, IL, September 2021 (In person seminar)
- 17) Modern Approaches to Polar Polyolefins, **CalTech**, Chemistry Department; Pasadena, CA, May 2021 (Virtual Seminar)
- 16) Modern Approaches to Polar Polyolefins, **Stanford University**, Chemistry Department; Palo Alto, CA, April 2021 (Virtual Seminar)
- 15) Modern Approaches to Polar Polyolefins, **Washington University in St. Louis**, Chemistry Department; St. Louis, MS, April 2021 (Virtual Seminar)
- 14) Modern Approaches to Polar Polyolefins, **University of Chicago**, Chemistry Department; Chicago,

- IL, Feb. 2021 (Virtual Seminar)
- 13) Ionic Fluorogels as PFAS Remediation from Water. **3M Company**, St. Paul, MN, Nov. 2020 (Virtual Seminar)
  - 12) Modern Approaches to Polar Polyolefins, **University of California Davis**, Chemistry Department; Davis, CA, Nov. 2020 (Virtual Seminar)
  - 11) Modern Approaches to Polar Polyolefins, **University of California Berkeley**, Chemistry Department; Davis, CA, Sept. 2020 (Virtual Seminar)
  - 10) Modern Approaches to Polar Polyolefins. **3M Company**, St. Paul, MN, July 2020 (Virtual Seminar)
  - 9) Stereoselective Cationic Polymerization of Vinyl Ethers. Matyjaszewski Lab Webinar Series, **Carnegie Mellon University**, June 2020 (Virtual Seminar)
  - 8) Stereoselective Cationic Polymerization of Vinyl Ethers. **Georgia Institute of Technology**, Atlanta, GA, May 2020 (student invited virtual seminar)
  - 7) Modern Approaches to Polar Polyolefins. **Army Research Laboratory**, Aberdeen, MD, May 2019.
  - 6) New Approaches to Polar Polyolefins. **Air Force Research Laboratory Materials & Manufacturing Directorate**, Dayton, OH, January 2019.
  - 5) C–H Functionalization of Commodity Polymers. **Eastman Chemical Company**, Kingsport, TN, April 2018.
  - 4) Late-Stage Diversification of Commodity Polymers. **Creighton University**, Chemistry Department; Omaha, NE, March 2018.
  - 3) Late-Stage Diversification of Commodity Polymers. **Reed College**, Chemistry Department; Portland, OR, February 2018.
  - 2) Late-Stage Diversification of Commodity Polymers. **Virginia Commonwealth University**, Chemical & Life Sciences Engineering Department, Richmond, VA, October 2017.
  - 1) Late-Stage Diversification of Commodity Polymers. **Milliken Chemical Company**, Spartanburg, SC, September 2017.

## Teaching Activities

### Courses Taught

**Spring 2022** CHEM 520L: Polymer Lab; 15 students (conducted CURE course)

**Fall 2021** CHEM 421: Polymer Synthesis; 26 students

- Expanding the CREATE teaching approach for polymer synthesis ([link](#))

**Fall 2020** CHEM 421: Polymer Synthesis; 36 students

- Used the CREATE teaching approach to introduce modern methods of polymer synthesis

**Fall 2019** CHEM 102: General Chemistry II; 216 students

- Implemented a strategic blend of active learning strategies, including elements of flipped classroom, just-in-time teaching, and high structure active participation.

**Spring 2019** CHEM 520L: Polymer Lab; 6 students (conducted CURE course)

- Established 520L as a Course-based Undergraduate Research Experience (CURE), including participation in a year-long Faculty Learning Community to learn effective approaches for developing, implementing, and carrying out an effective CURE.

**Fall 2018** CHEM 421: Polymer Synthesis; 20 students

- Used the CREATE teaching approach to introduce modern methods of polymer synthesis

**Spring 2018** CHEM 520L: Polymer Lab; 10 students

**Spring 2018** CHEM 721: Polymer Seminar; 9 students

**Fall 2017** CHEM 421: Polymer Synthesis; 25 students

**Fall 2016** CHEM 421: Polymer Synthesis; 20 students

### Current Graduate Students

- 10) Cali Colliver (expected graduation: Spring 2026)
- 9) Christopher Diamond-Hettinger (expected graduation: Spring 2026)
- 8) Caroline Coxwell (expected graduation: Spring 2026)
- 7) Jordan Levi (expected graduation: Spring 2025)
- 6) Eliza Neidhart (expected graduation: Spring 2025)
- 5) Johann Rapp (expected graduation: Spring 2025)
- 4) Caleb Kozuszek (expected graduation: Spring 2025)
- 3) Joe-Yee Mak (expected graduation: Spring 2025)
- 2) Cole Sorensen (expected graduation: Spring 2024)
  - *Recognitions*: NSF GRFP Honorable Mention (2021)
- 1) Victoria Barber (expected graduation: Spring 2024)

### Former Graduate Students

- 8) Irene Manning (PhD Degree earned: Summer 2022)
  - *Recognitions*: Merck Research Award (2022); UNC Graduate School Impact Award (2022), UNC Chemistry Dobbins Fellowship (2021), Alternate for NDSEG Fellowship (2019)
  - *Thesis*: Ionic Fluorogels for Remediation of Per- and Polyfluorinated Alkyl Substances from Water
  - *Current position*: Research Scientist at UNC Chapel Hill
- 7) Nick Taylor (*PhD degree earned: Summer 2022*)
  - *Thesis*: Design and Synthesis of O<sub>2</sub>-Sensative <sup>19</sup>F MRI Agents
  - *Current position*: Research Scientist at Eastman Chemical Company
- 6) Alexis Sarabia (*M.A. degree earned Summer 2021*)
  - *Current position*: Scientist at Lindy Biosciences, Inc.
- 5) Jill Williamson-Alty (*PhD degree earned: Spring 2021*)
  - *Recognitions*: Clare Booth Luce Fellow (2018); NSF GRFP Honorable Mention (2018), UNC Venable Metal (2020)
  - *Thesis*: Amidyl Radical-Mediated Polyolefin C–H Functionalization
  - *Current position*: Postdoctoral Researcher at MIT with Prof. Laura Kiessling
- 4) Sally Lewis (*PhD degree earned: Spring 2021*)
  - *Recognitions*: NSF GRFP Honorable Mention (2018); UNC Eliel Fellowship (2020)
  - *Thesis*: Perfluoroalkylation of Commodity Polymers and Kinetic Resolution Polymerization of Cyclic Monomers
  - *Current position*: Senior Product Development Engineer at 3M
- 3) Travis Varner (*PhD degree earned: Spring 2021*)
  - *Recognitions*: NSF GRFP Honorable Mention (2018)
  - *Thesis*: Stereoselective Cationic Polymerization of Vinyl Ethers through Asymmetric Ion-Pairing Catalysis
  - *Current position*: Assistant Teaching Professor at North Carolina State University
- 2) Marcus Reis (*PhD degree earned: Spring 2021*)
  - *Recognitions*: UNC Hiskey Graduate Fellow (2019)
  - *Thesis*: Reimagining Polymer Synthesis through the Combination of Continuous-Flow Chemistry, Reactor Engineering, and Automation

- *Current position*: Research Scientist at Eastman Chemical Company

1) Robert R. R. Johnson III (*M.S. degree earned Spring 2020*)

### Current Postdoctoral Scholars

3) Jake Jagannathan (November 2021–present)

- Ph.D. University of California Davis

2) Quan Tran (July 2021–present)

- Ph.D. University of Houston

1) Meredith A. Borden (August 2020–present)

- Ph.D. Princeton University

### Former Postdoctoral Scholars

3) Aaron Teator (February 2017–June 2021)

- Ph.D. University of Texas
- *Current position*: Assistant Professor of Chemistry at Kansas University

2) Phil Knutson (August 2019–April 2021)

- Ph.D. University of Georgia
- *Current position*: Research Scientist at Milliken Chemical Company

1) Elango Kumarasamy (July 2018–August 2019)

- Ph.D. University of North Dakota
- *Current position*: Research Scientist at Conamix Inc.

### Professional Service Activities

#### Professional Service to Discipline

**Member**; Editorial Advisory Board: *Journal of Polymer Science* (2019–present)

**Member**; American Chemical Society (2008–present)

**Media Contributions**; interviewed for and quoted in statewide and national media, including:

- *Carolina Insider* (podcast): Jan. 28th 2022 episode ([link](#))
- *The Washington Post*: “Nobel Prize in chemistry awarded to duo who helped construct molecules in a cheap, environmentally friendly way” ([link](#)); Oct. 2021
- *Popular Science*: “The 10 most brilliant scientists in the US today” ([link](#)); Sept. 2021
- *Discover Magazine*: “There’s PFAS in our Water: How do we get them out?” ([link](#)); August 2021
- *The Assembly*: “Silent Waters” ([link](#)); March 2021
- *Bringing Chemistry to Life* (podcast): Reinventing plastics one reaction at a time ([link](#)); Oct. 2020

#### Referee

- **Peer-reviewed journals**; including *Science*, *Nature*, *Nature Chemistry*, *Nature Communications*, *Journal of the American Chemical Society*, *Angewandte Chemie International Edition*, *Chemical Science*, *Chemical Reviews*, *Macromolecules*, *ACS Macro Letters*, *Polymer Chemistry*, *Journal of Polymer Science Part A: Polymer Chemistry*, *Macromolecular Rapid Communications*, *Polymer*, *Synlett*

- **Funding agencies**; National Science Foundation; Army Research Office; Air Force Office of Scientific Research, Department of Energy; Petroleum Research Fund, Research Corporation, Samsung Incubation Center.

#### Conference & Symposium Organization

- Conference Co-Organizer; 12<sup>th</sup> Annual Triangle Soft Matter Workshop; UNC Chapel Hill; May 11, 2020
- Symposium co-organizer; symposium at the 258<sup>th</sup> ACS National Meeting, PMSE division; Continuous Flow Chemistry in Polymer Science; August 25-26, 2019; San Diego, CA.
- Session Chair; 256<sup>th</sup> ACS National Meeting “PMSE Young Investigator Symposium”; August 2018
- Symposium co-organizer; symposium at the 255<sup>th</sup> ACS National Meeting, POLY division; International Symposium on Biorelated Polymers: Innovation in Biomedical Polymers; March 19-20, 2018; New Orleans, LA.
- Session Chair; SERMACS ACS Regional Meeting “Polymer Chemistry”; November 2017
- Conference Organizer; 9<sup>th</sup> Annual Triangle Soft Matter Workshop; UNC Chapel Hill; May 15, 2017.

## UNC Chapel Hill

### Department of Chemistry Committees

- Faculty Search Committee for tenure-track faculty, 2021–2022
- Student Wellness Committee, 2019–present
- Faculty Search Committee for tenure-track faculty, 2018–2019
- Diversity Committee, 2016–present
- Faculty Search Committee for teaching assistant professor, 2016–2017

### University Committees

- Goldwater Review Committee, 2021–present
- Summer Undergraduate Research Fellowship review committee, 2021
- UNC Office of Undergraduate Research Faculty Advisory Board, 2018–present

### Faculty Learning Communities

- Course-based Undergraduate Research faculty learning community, 2018-2019
- HHMI Summer Institute on Scientific Teaching; UNC Chapel Hill; June 2017

### Faculty Advisor

- Epsilon Tau Pi, Eagle Scout community service fraternity, 2021–present
- Allies for Minorities and Women in Science & Engineering (co-advisor), 2018–present

**Organizer** of the Slayton Evans Outreach Event, which brings 6 to 10 talented undergraduate students from local HBCUs to UNC to learn about the opportunities in STEM careers (2018–present)

## Greater North Carolina Community

**Presenter**; PFAS Testing Network Legislative Forum for state Senator deViere and state Representative Szoka to report on outcomes of the state funded PFAS Testing Network

**Organizer** (2016–2020); Outreach effort in collaboration with UNC Wonder Connection; The Leibfarth group engages hospitalized children in the thrill of scientific discovery and polymer science through personal interactions, real-time, technology-based tutorials and research updates, and large group workshops. The group interacts with >150 patients and family members per year, which includes >75 hours of direct patient contact time.