

CAROLINE R. SZCZEPANSKI

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PROFESSIONAL APPOINTMENTS

Assistant Professor, Michigan State University <i>Department of Chemical Engineering & Materials Science</i>	Aug. 2019 – Present East Lansing, MI
Research Assistant Professor, Northwestern University <i>Department of Chemical & Biological Engineering</i>	Aug. 2017 – Aug. 2019 Evanston, IL
Postdoctoral Researcher, Université Côte d'Azur <i>Institut Méditerranéen du Risque de l'Environnement et du Développement Durable</i>	Feb. 2015 – Aug. 2017 Nice, France

EDUCATION

University of Colorado, Boulder, CO, USA <i>Ph.D., M.S. Chemical and Biological Engineering</i>	Aug. 2009 - Dec. 2014
Lafayette College, Easton, PA, USA <i>B.S. Chemical Engineering, Minor: Spanish</i>	Aug. 2005 - May 2009

AWARDS

NIH/NIDCR - Mentored Quantitative Research Career Development Award	2020-2025
CIBA Foundation and The American Chemical Society - Young Scientist Travel Award	2016
Prestige Incoming Post-Doctoral Research Grant, European Union Marie Curie Actions	2015
University of Colorado Departmental Service Award, Chemical & Biological Engineering	2014
University of Colorado Graduate School Student International Travel Grant	2012
University of Colorado Best Should Teach Silver Award	2012
Honor Societies Inducted: Phi Beta Kappa, Tau Beta Pi, Sigma Xi	2009
Lafayette College, Luther F. Witmer Prize for success in materials science and engineering	2009
Lafayette College, Carl J. Staska Prize, recognizing expertise in chemical laboratory skills	2009
Lafayette College, Charles Duncan Fraser Prize, for materials science and engineering	2009
Lafayette College, Dean's List	2005-2009
Lafayette College, Marquis Scholar, highest academic scholarship awarded	2005-2009

RESEARCH GRANTS

NIH/NIDCR K25, Role: PI <i>Reinforcing dental adhesives with monomers capable of dynamic rearrangement & self-recovery</i>	July 2020 - June 2025 \$783,790
Michigan State University Strategic Partnership Grant, Role: co-PI <i>Hemp Fiber-based Ultra-resilient Carbon-negative Construction Materials</i>	Jan. 2023 - June 2023 \$50,000
Québec/United States University Grant Program, Role: co-PI <i>From Materials Sciences to Supply Chain Strengthening: Establishing Interuniversity Cooperation</i>	Oct. 2022 - June 2023 \$16,890
Strategic Partnership Grant - Canadian Studies Center, Role: PI <i>Supporting collaborations in materials & wood sciences between MSU - Université Laval</i>	Jan. 2022 - Sept. 2022 \$1,800
Ford Alliance Summer Sabbatical Program, Role: PI <i>Bioinspired Additive Manufacturing</i>	May 2020 - Aug. 2020 \$18,400

PENDING RESEARCH PROPOSALS

Rolex Awards for Enterprise, Role: PI <i>Versatile polymer coatings for atmospheric water harvesting</i>	Jan. 2023 - Dec. 2024 \$200,000
NSF/DMR, Role: PI <i>Collaborative research: Gel rupture under simple and dynamic loading</i>	June 2023 - May 2026 \$289,044

NSF/ENG, Role: PI

June 2023 - May 2026

A Wrinkle in Time: The Dynamics of Stimuli-responsive Topographical Changes

\$438,347

PUBLICATIONS

[Up to date works at Google Scholar](#)

Mentored researchers are underlined, *Indicates where C.R. Szczepanski is corresponding author

35. Shafi Ur Rehman, Sana Javaid, Muhammad Shahid, Nasir Mahmood Ahmad, Badar Rashid, **Caroline R. Szczepanski**, & Asim Shahzad. “The Synergistic Effect of Polystyrene/Modified Boron Nitride Composites for Enhanced Mechanical, Thermal and Conductive Properties” *Polymers*, 15(1), 2023.
34. Justin Hamlin, Md Nuruddin, Volodymyr Tarabara, & ***Caroline R. Szczepanski**. “Incorporation of cellulose nanocrystals and reactive surfactants for improved pressure-sensitive adhesive performance” *AIChE Journal*, 68(12), e17910, 2022. *Included in the *AIChE Journal Futures Issue, 2022*
33. Shafi Ur Rehman, Sana Javaid, Muhammad Shahid, Iftikhar Hussain Gul, Badar Rashid, **Caroline R. Szczepanski**, Muhammad Naveed, & Sabrina J. Curley. “Polystyrene-Sepiolite Clay Nanocomposites with Enhanced Mechanical and Thermal Properties” *Polymers*, 14(17), 2022.
32. Jordy Queiros Campos, **Caroline R. Szczepanski**, Marie Gabrielle Medici, & Guilhem Godeau. “Inspired by the Nature: A Post-Printed Strategy to Efficiently Elaborate Parahydrophobic Surfaces” *Biomimetics*, 7(3), 2022.
31. Ingrid Calvez, Sorour Davoudi, **Caroline R. Szczepanski**, & Véronic Landry. “Low-gloss UV-curable coatings: Light mechanisms, formulations and processes — A review” *Progress in Organic Coatings*, 171, 107039, 2022.
30. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Effect of Copolymer on the Wrinkle Structure Formation and Gloss of a Phase-Separated Ternary Free-Radical/Cationic Hybrid System for the Application of Self-Matting Coatings” *Polymers*, 14(12), 2022.
29. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Hybrid Free-Radical/Cationic Phase-Separated UV-Curable System: Impact of Photoinitiator Content and Monomer Fraction on Surface Morphologies and Gloss Appearance” *Macromolecules*, 55(8), 3129–3139, 2022.
28. Shafi Ur Rehman, Sana Javaid, Muhammad Shahid, Mutawara Mahmood Baig, Badar Rashid, **Caroline R. Szczepanski**, & Sabrina J. Curley. “Synthesis of Magnetic Fe₃O₄ Nano Hollow Spheres for Industrial TNT Wastewater Treatment” *Nanomaterials*, 12(5), 2022.
27. Xiaomin Yu Godeau, Freddy Jocelyne Andrianandrasana, Olga Volkova, **Caroline R. Szczepanski**, Arnaud Zenerino, Olivier Montreuil, René-Paul Godeau, Pavel Kuzhir, & Guilhem Godeau. “Investigation on dung beetle’s (*Heliocopris Hope*, 1838) chitosan valorisation for hydrogel 3D printing” *International Journal of Biological Macromolecules*, 199, 172–180, 2022.
26. Léna Ciffréo, Claire Marchand, **Caroline R. Szczepanski**, Marie-Gabrielle Medici, & Guilhem Godeau. “Bioinspired and Post-Functionalized 3D-Printed Surfaces for Parahydrophobic Performance” *Biomimetics*, 6(4), 2021.
25. Md Nuruddin, Justin Hamlin, Caitlyn M. Clarkson, John A. Howarter, ***Caroline R. Szczepanski**, & Jeffrey P. Youngblood. “Processing and Characterization of Food-Grade Plasticizer-Compatibilized Cellulose Nanocrystals and Ethylene Vinyl Alcohol Copolymer Nanocomposites” *ACS Applied Polymer Materials*, 3(10), 5000–5011, 2021.
24. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Preparation and

- characterization of low gloss UV-curable coatings based on silica surface modification using an acrylate monomer” *Progress in Organic Coatings*, 158, 106369, 2021.
23. Md Nuruddin, Reaz A. Chowdhury, Ryan Szeto, John A. Howarter, Kendra A. Erk, ***Caroline R. Szczepanski**, & Jeffrey P. Youngblood. “Structure/Property Relationship of Cellulose Nanocrystal/Polyvinyl Alcohol Thin Films for High Barrier Coating Applications” *ACS Applied Materials & Interfaces*, 13(10), 12472–12482, 2021. PMID: 33656333.
 22. Kelsey-Ann Leslie, Robert Doane-Solomon, Srishti Arora, Sabrina J. Curley, **Caroline R. Szczepanski**, & Michelle M. Driscoll. “Gel rupture during dynamic swelling” *Soft Matter*, 17, 1513–1520, 2021.
 21. Caroline Fradin, François Orange, Sonia Amigoni, **Caroline R. Szczepanski**, Frédéric Guittard, & Thierry Darmanin. “Micellar formation by soft template electropolymerization in organic solvents” *Journal of Colloid and Interface Science*, 590, 260–267, 2021.
 20. Tanguy Marmier, **Caroline R. Szczepanski**, Christophe Candet, Arnaud Zenerino, René-Paul Godeau, & Guilhem Godeau. “Investigation on *Mecynorhina torquata* Drury, 1782 (Coleoptera, Cetoniidae, Goliathini) cuticle: Surface properties, chitin and chitosan extraction” *International Journal of Biological Macromolecules*, S0141813020339003, 2020.
 19. Pauline Fournier, **Caroline R. Szczepanski**, René-Paul Godeau, & Guilhem Godeau. “Chitosan Extraction from *Goliathus orientalis* Moser, 1909: Characterization and Comparison with Commercially Available Chitosan” *Biomimetics*, 5(2), 15, 2020.
 18. Imen Bousrih, Mejda El Kateb, **Caroline R. Szczepanski**, Mohammed Beji, Frédéric Guittard, & Thierry Darmanin. “A bioinspired strategy for designing well-ordered nanotubular structures by templateless electropolymerization of thieno[3,4-*b*]thiophene-based monomers” *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 378(2167), 20190450, 2020.
 17. ***Caroline R. Szczepanski** & John M. Torkelson. “Engineering Surface Hydrophilicity via Polymer Chain-End Segregation in Coatings Formed by Photopolymerization” *ACS Applied Polymer Materials*, 3095–3102, 2019.
 16. El hadji Yade Thiam, Abdoulaye Dramé, Salif Sow, Aboubacary Sene, **Caroline R. Szczepanski**, Samba Yandé Dieng, Frédéric Guittard, & Thierry Darmanin. “Designing Nanoporous Membranes through Templateless Electropolymerization of Thieno[3,4-*b*]thiophene Derivatives with High Water Content” *ACS Omega*, 4(8), 13080–13085, 2019.
 15. Olivier Montreuil, Christophe Candet, Alexandre Bonaccorso, **Caroline R. Szczepanski**, François Orange, René-Paul Godeau, Frédéric Guittard, Thierry Darmanin, & Guilhem Godeau. “Micro- and nanoscopic observations of sexual dimorphisms in *Mecynorhina polyphemus confluens* (Kraatz, 1890) (Coleoptera, Cetoniidae, Goliathini) and consequences for surface wettability” *Arthropod Structure & Development*, 49, 10–18, 2019.
 14. Guilhem Godeau, François Orange, René-Paul Godeau, **Caroline R. Szczepanski**, Frédéric Guittard, & Thierry Darmanin. “Variations in surface structures and wettability in the genus *Pachnoda* Burmeister” *Bioinspired, Biomimetic and Nanobiomaterials*, 8(3), 181–189, 2019.
 13. ***Caroline R. Szczepanski**, Thierry Darmanin, Guilhem Godeau, & Frédéric Guittard. “Rapid, Template-Less Patterning of Polymeric Interfaces for Controlled Wettability via in Situ Heterogeneous Photopolymerizations” *Macromolecular Chemistry and Physics*, 219(16), 1800090, 2018.
 12. Guilhem Godeau, René-Paul Godeau, François Orange, **Caroline R. Szczepanski**, Frédéric Guittard, & Thierry Darmanin. “Variation of *Goliathus orientalis* (Moser, 1909) Elytra Nanostructurations and Their Impact on Wettability” *Biomimetics*, 3(2), 2018.
 11. **Caroline R. Szczepanski**, Thierry Darmanin, Guilhem Godeau, & Frédéric Guittard.

- “Nanofold-decorated surfaces from the electrodeposition of di-alkyl-cyclopentadithiophenes” *Polymers for Advanced Technologies*, 29(3), 1170–1181, 2018.
10. **Caroline R. Szczepanski**, Frédéric Guittard, & Thierry Darmanin. “Recent advances in the study and design of parahydrophobic surfaces: From natural examples to synthetic approaches” *Advances in Colloid and Interface Science*, 241, 37–61, 2017.
 9. **Caroline R. Szczepanski**, Inès M’Jid, Thierry Darmanin, Guilhem Godeau, & Frédéric Guittard. “A template-free approach to nanotube-decorated polymer surfaces using 3,4-phenylenedioxythiophene (PhEDOT) monomers” *Journal of Materials Chemistry A*, 4 (44), 17308–17323, 2016.
 8. **Caroline R. Szczepanski**, Thierry Darmanin, & Frédéric Guittard. “Spontaneous, Phase-Separation Induced Surface Roughness: A New Method to Design Parahydrophobic Polymer Coatings with Rose Petal-like Morphology” *ACS Applied Materials & Interfaces*, 8(5), 3063–3071, 2016.
 7. Guilhem Godeau, **Caroline R. Szczepanski**, Thierry Darmanin, & Frederic Guittard. “Nanoparticle covered surfaces: An efficient way to enhance superhydrophobic properties” *Materials & Design*, 92, 911–918, 2016.
 6. **Caroline R. Szczepanski**, Thierry Darmanin, & Frederic Guittard. “Using poly(3,4-ethylenedioxythiophene) containing a carbamate linker as a platform to develop electrodeposited surfaces with tunable wettability and adhesion” *RSC Advances*, 5(109), 89407–89414, 2015.
 5. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Modification of linear prepolymers to tailor heterogeneous network formation through photo-initiated polymerization-induced phase separation” *Polymer*, 70, 8–18, 2015.
 4. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Accessing photo-based morphological control in phase-separated, cross-linked networks through delayed gelation” *European Polymer Journal*, 67, 314–325, 2015.
 3. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Stress reduction in phase-separated, cross-linked networks: Influence of phase structure and kinetics of reaction” *Journal of Applied Polymer Science*, 131(19), n/a–n/a, 2014.
 2. Carmem S. Pfeifer, Zachary R. Shelton, **Caroline R. Szczepanski**, Matthew D. Barros, Nicholas D. Wilson, & Jeffrey W. Stansbury. “Tailoring heterogeneous polymer networks through polymerization-induced phase separation: influence of composition and processing conditions on reaction kinetics and optical properties” *Journal of Polymer Science Part A: Polymer Chemistry*, 52(13), 1796–1806, 2014.
 1. **Caroline R. Szczepanski**, Carmem S. Pfeifer, & Jeffrey W. Stansbury. “A new approach to network heterogeneity: Polymerization induced phase separation in photo-initiated, free-radical methacrylic systems” *Polymer*, 53(21), 4694–4701, 2012.

TEACHING RECORD

Michigan State University

Material and Energy Balances, CHE 201: Instructor of record, 51 students with teaching assistant: Carson Malhado	Fall 2022
Biomimicry in Engineering, CHE 891: Instructor of record, 6 students	Spring 2022
Material and Energy Balances, CHE 201: Instructor of record, 43 students with teaching assistant: Sabrina Curley	Fall 2021
Material and Energy Balances, CHE 201: Instructor of record, 68 students with teaching assistant: Sunanda Dey	Spring 2021

Material and Energy Balances, CHE 201: Instructor of record, 68 students with teaching assistant: Donald Walters <i>Northwestern University</i>	Spring 2020
Introduction to Polymers, CHE 361: Guest lecturer, 25 students with instructor of record: John M. Torkelson <i>Université Côte d'Azur</i>	Fall 2017
Master in Chemistry and Materials (MCM): Internship Supervisor, 18 students <i>University of Colorado at Boulder</i>	Spring 2017
General Chemistry for Engineers, CHEN 1211: Co-instructor, 75 students with co-instructor: Janet DeGrazia	Spring 2014
Lead Teaching Assistant: Dept. Chemical and Biological Engineering Trained all Teaching Assistants in the Department of Chemical and Biological Engineering	2012-2013
Instrumentation & Process Control, CHEN 4570: Teaching Assistant, 70 students with instructor of record: Arthi Jayaraman	Spring 2012
General Chemistry for Engineers, CHEN 1211: Teaching Assistant, 20 students with instructor of record: Janet DeGrazia	Spring 2010

 INVITED TALKS AND SEMINARS

21. "Incorporation of Cellulose Nanocrystals and Reactive Surfactants for Improved Pressure Sensitive Adhesive Performance" AIChE Futures Session, 2022 AIChE Annual Meeting. Phoenix, Arizona, November 15, 2022.
20. "Effective strategies for hierarchically structured polymeric materials" Department of Chemical Engineering & Materials Science, Michigan State University, Graduate Research Symposium, August 26, 2022.
19. "Engineering local heterogeneities to create multi-scale, hierarchically structured polymer surfaces" IUMRS - International Conference of Young Researchers on Advanced Materials, Fukuoka Japan (delivered virtually), August 5, 2022.
18. "Taking advantage of complexity: Leveraging heterogeneity to tailor soft material performance" Department of Wood Sciences & Forestry, Université Laval, Canada, April 19, 2022.
17. "Taking advantage of complexity: Leveraging heterogeneity to tailor soft material performance" Department of Materials Engineering, Purdue University (Virtual), February 14, 2022.
16. "Biomimetic strategies to manipulate bulk and interfacial behavior of polymer materials" Department of Chemical Engineering, University of Toledo (Virtual), October 7, 2021.
15. "Tailoring interfacial behavior of polymer materials via bio-inspired designs" Department of Chemistry, University of Wah, Pakistan (Virtual), September 8, 2021.
14. "Tailoring bulk and interfacial behavior of polymer materials via bio-inspired design" Seminar to the Committee for Scientific Innovation and Interaction, BASF. (Virtual), August 10, 2021.
13. "Manipulating bulk and interfacial behavior of polymer networks using bioinspired techniques" Chemical Engineering Program, School for the Engineering of Matter, Transport, and Energy, Arizona State University (Virtual), April 12, 2021.
12. "Polymer engineering approaches to design hybrid, structured materials" Department of Chemical and Biomolecular Engineering, University of Maryland. College Park, Maryland, USA, February 13, 2019.
11. "Polymer engineering approaches to design hybrid, structured materials" Department of Chemical Engineering, University of Massachusetts Lowell. Lowell, Massachusetts, USA,

- February 11, 2019.
10. “Polymer engineering approaches to design hybrid, structured materials” Department of Chemical Engineering and Materials Science, Michigan State University. East Lansing, Michigan, USA, February 7, 2019.
 9. “Polymer engineering approaches to design hybrid, structured materials” Department of Chemical and Materials Engineering, University of Kentucky. Lexington, Kentucky, USA, January 28, 2019.
 8. “Design of biomimetic polymer interfaces: using photopolymerization techniques to simultaneously control surface chemistry and topography” Keynote presentation, N.I.C.E. 2018 – 4th International Conference on Bioinspired and Biobased Chemistry & Materials, Nice, France, October 18, 2018.
 7. “Reaction induced phase separation as a tool to manipulate heterogeneous structure and optimize bulk properties in rapidly forming, acrylic networks” Army Research Laboratory Polymer Division. Aberdeen, Maryland, USA, October 11, 2018.
 6. “Engineering Polymerization Reactions for Enhanced Surface Performance” Department of Chemical Engineering, Illinois Institute of Technology. Chicago, Illinois, USA, February 7, 2018.
 5. “Engineering approaches to improve polymeric materials” Department of Chemical Engineering, Bucknell University. Lewisburg, Pennsylvania, USA, February 7, 2017.
 4. “Effective Learning from Well-Defined Goals and Assessment Opportunities” Department of Chemical and Biological Engineering, Colorado School of Mines. Golden, Colorado, USA, April 7, 2016.
 3. “Advanced & Improved Approaches towards the Design & Fabrication of Heterogeneous Polymeric Materials” Department of Chemical & Biomolecular Engineering, Lafayette College. Easton, Pennsylvania, USA, February 10, 2016.
 2. “Heterogeneous Network Formation via Polymerization Induced Phase Separation: An approach to low shrinkage dental restorative materials” Interdisciplinary Seminar Series at Lafayette College. Easton, Pennsylvania, USA, March 1, 2013.
 1. “Utilizing polymerization-induced phase separation to improve dental restorative materials” Research Day Symposium, University of Colorado School of Dental Medicine. Aurora, Colorado, USA, February 15, 2013.

FIRST-AUTHOR CONFERENCE CONTRIBUTIONS

**Mentored researchers are underlined*

28. **Caroline R. Szczepanski** & Denghao Fu. “Selective incorporation of hydrogen bonding sites within dental adhesive networks to improve performance and longevity” Poster presentation, 2022 Annual meeting of the Academy of Dental Materials. Athens, Greece, October 1, 2022.
27. **Caroline R. Szczepanski**. “Introducing a bio-inspired framework to semester-long engineering design projects at the graduate level” Poster presentation, 2022 ASEE/AICHe Summer School for Engineering Faculty. Golden, Colorado, USA, July 25, 2022.
26. **Caroline R. Szczepanski** & Denghao Fu. “Impact of Catechol Functionalities on Network Properties and Adhesive Performance” Oral presentation, 2022 Meeting of the American Association of Dental, Oral and Craniofacial Research. Atlanta, Georgia, USA, March 23, 2022.
25. **Caroline R. Szczepanski**, Sabrina J. Curley, & Alyssa VanZanten. “Leveraging heterogeneous network design to yield biomimetic, hierarchical surface features” Oral presentation, 2022 Meeting of the Adhesion Society. San Diego, California, USA, February

- 2022.
24. **Caroline R. Szczepanski**, Md Nuruddin, Justin Hamlin, Caitlyn Clarkson, John Howarter, & Jeffrey P. Youngblood. "Selection and processing of food grade plasticizers to compatibilize cellulose nanocrystals / ethylene vinyl alcohol copolymer nanocomposites" Oral presentation, 2021 AIChE Annual Meeting. Boston, Massachusetts, USA, November 2021.
 23. **Caroline R. Szczepanski** & Denghao Fu. "Improvement of Dental Adhesives with Bio-inspired Monomers" Oral presentation, 2021 Meeting of the IADR (International Association for Dental Research) (virtual), July 2021.
 22. **Caroline R. Szczepanski** & Sabrina J. Curley. "Biomimetic polymer interfaces via photopolymerizations to simultaneously control surface chemistry and topography" Oral presentation, University of Massachusetts, Center for Evolutionary Materials, New Frontiers in Bioinspiration Series (virtual), June 2020.
 21. **Caroline R. Szczepanski** & John M. Torkelson. "Manipulation of Surface Chemistry Via Polymer Chain-End Segregation in Topologically Constrained Materials" Oral presentation, 2019 AIChE Annual Meeting. Orlando, Florida, USA, November 2019.
 20. **Caroline R. Szczepanski** & Crestelynn Ligo. "Reinforcement of Dental Adhesives with Bio-Inspired Monomers" Poster presentation, 2019 Annual Meeting of the Academy of Dental Materials. Jackson Hole, Wyoming, USA, October 2019.
 19. **Caroline R. Szczepanski** & John M. Torkelson. "Thermodynamic manipulation of polymerization induced phase separation: influence of entropic versus enthalpic driving forces" Oral presentation, 2018 AIChE Annual Meeting. Pittsburgh, Pennsylvania, USA, October 2018.
 18. **Caroline R. Szczepanski**, Thierry Darmanin, Frédéric Guittard, Guilhem Godeau, & John M. Torkelson. "Designing biomimetic polymeric interfaces: using photopolymerization techniques to simultaneously control surface topography, chemistry and functionality" Oral presentation, 2018 AIChE Annual Meeting. Pittsburgh, Pennsylvania, USA, October 2018.
 17. **Caroline R. Szczepanski** & John M. Torkelson. "Optimization of network properties via thermodynamic manipulation of phase separation during polymerization of multifunctional methacrylates in the presence of poly(n-alkyl methacrylate)" Oral presentation, National Meeting of the American Chemical Society. Boston, Massachusetts, USA, August 2018.
 16. **Caroline R. Szczepanski**, Inès M'Jid, Thierry Darmanin, Guilhem Godeau, & Frédéric Guittard. "Nanotube decorated interfaces via template-less, electropolymerization of thiophene-based monomers" Oral presentation, National Meeting of the American Chemical Society. Boston, Massachusetts, USA, August 2018.
 15. **Caroline R. Szczepanski**, Thierry Darmanin, Frédéric Guittard, Guilhem Godeau, & John M. Torkelson. "Designing biomimetic polymeric interfaces: using photopolymerization techniques to simultaneously control surface chemistry, topography and functionality" Oral presentation, National Meeting of the American Chemical Society. Boston, Massachusetts, USA, August 2018.
 14. **Caroline R. Szczepanski**. "Photopolymerization techniques to design biomimetic, micro-structured interfaces" Oral presentation, 2018 AIChE Midwest Regional Conference. Chicago, Illinois, USA, March 2018.
 13. **Caroline R. Szczepanski**, Thierry Darmanin, & Frédéric Guittard. "Phase Separation-Induced Surface Roughness: A One-Step Approach to Tune Surface Wettability" Oral presentation, N.I.C.E. 2016 – 3rd International Conference on Bioinspired and Biobased Chemistry & Materials. Nice, France., October 2016.
 12. **Caroline R. Szczepanski**, Thierry Darmanin, & Frédéric Guittard. "Utilizing Heterogeneous Network Formation to Tune Surface Roughness: A Method to Control Coating Wettability"

- Oral presentation, National Meeting of the American Chemical Society. San Diego, California, USA., March 2016.
11. **Caroline R. Szczepanski**, Thierry Darmanin, & Frédéric Guittard. “Phase Separation Induced Surface Roughness as an Approach to Control Surface Wetting.” Oral Presentation, Annual Meeting of the Groupe Français des Polymères – Section Méditerranée. Nice, France., October 2015.
 10. **Caroline R. Szczepanski**, Carmem S. Pfeifer, & Jeffrey W. Stansbury. “Design of Heterogeneous Structure through Polymerization-Induced Phase Separation: Utilizing Compositional Variations and Processing Conditions.” Poster presentation, Photopolymerizations Industry University Collaborative Research Center (IUCRC) Spring Meeting. Hartford, Connecticut, USA., June 2014.
 9. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Control of Heterogeneous Structure Using Photopolymerization-Induced Phase Separation.” Poster presentation, Photopolymerizations Industry University Collaborative Research Center (IUCRC) Winter Meeting. Boulder, Colorado, USA., January 2014.
 8. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Modification of Linear Prepolymers to Control Polymerization-Induced Phase Separation in a Free-Radical Photo-Polymerization.” Oral presentation, 2013 AIChE Annual Meeting. San Francisco, California, USA., November 2013.
 7. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Stress reduction in heterogeneous networks via polymerization induced phase separation.” Poster Presentation, Photopolymerization Fundamentals Meeting. Jackson Hole, Wyoming, USA., September 2013.
 6. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Stress reduction control in photo-polymerized networks via polymerization induced phase separation.” Oral presentation, IUPAC 10th International Conference on Advanced Polymers via Macromolecular Engineering. Durham, United Kingdom., August 2013.
 5. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Stress reduction via heterogeneous network formation.” Poster presentation, Materials Research Day - University of Colorado Materials Science and Engineering Program. Boulder, Colorado, USA, April 2013.
 4. Erik A. Hogan, Kyle A. Kyburz, Adelle Montebianco, **Caroline R. Szczepanski**, & Janet Tsai. “Active Learning at the University of Colorado at Boulder.” Poster presentation, University of Colorado Lead Network Capstone Poster Session. Boulder, Colorado, USA, April 2013.
 3. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Design of Low-shrinkage, heterogeneous networks via Polymerization Induced Phase Separation.” Poster presentation, Polymer Networks Group Meeting. Jackson Hole, Wyoming, USA, August 2012.
 2. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Polymerization Induced Phase Separation in Photo-Initiated Systems.” Oral presentation, National Meeting of the American Chemical Society. San Diego, California, USA., March 2012.
 1. **Caroline R. Szczepanski** & Jeffrey W. Stansbury. “Polymerization Induced Phase Separation in Photo-Initiated Systems.” Poster presentation, Photopolymerization Fundamentals Meeting. Breckenridge, Colorado, USA., July 2011.

CO-AUTHOR CONFERENCE CONTRIBUTIONS

**Mentored researchers are underlined*

30. Alyssa VanZanten & **Caroline R. Szczepanski**. “Rupture and wrinkling: Probing two regimes of instability in PEG-based hydrogels” Oral presentation, 2023 Spring Meeting of the American Chemical Society. Indianapolis, Indiana, USA, March 28, 2023.

29. Sabrina J. Curley & **Caroline R. Szczepanski**. “Complex and Hierarchical Surface Patterning Achieved Through Metal Templates Facilitating Bulk Phase Separation and Surface Wrinkling” Poster presentation, 2023 Meeting of the Adhesion Society. Orlando, Florida, USA, February 20, 2023.
28. Denghao Fu & **Caroline R. Szczepanski**. “Improvement of dentin bonding by incorporation of self-complementary multiple hydrogen-bonding moieties into the methacrylate-based polymer network” Poster presentation, 2023 Meeting of the Adhesion Society. Orlando, Florida, USA, February 20, 2023.
27. Gouree Kumbhar, Geetanjali Shukla, Chase Bruggeman, **Caroline R. Szczepanski**, David Hickey, & Robert J. Ferrier. “Novel polyether-based amphoteric ion exchange membrane for electrochemical systems” Oral presentation, 2022 AIChE Annual Meeting. Phoenix, Arizona, USA, November 2022.
26. Allison Huckins, Sabrina J. Curley, & **Caroline R. Szczepanski**. “Soybean-Derived Photopolymer Resins: Characterization of Surface and Bulk Properties” Poster presentation, 2022 AIChE Annual Meeting. Phoenix, Arizona, USA, November 2022. **Awarded Second Place Undergraduate Poster Prize - Materials Engineering & Science Division*
25. Denghao Fu & **Caroline R. Szczepanski**. “Improvement of Methacrylate-Based Polymer Networks by Introduction of Catechol Moieties” Poster presentation, 2022 ACS Midland Fall Meeting. Saginaw Valley State University, Michigan, USA, October 2022. **Awarded First Place Poster Prize*
24. Sabrina J. Curley & **Caroline R. Szczepanski**. “Kinetically Driven Hierarchical Wrinkle Formation in Photoinduced Phase Separating Free Radical Polymer Systems” Poster presentation, 2022 ACS Midland Fall Meeting. Saginaw Valley State University, Michigan, USA, October 2022.
23. Sabrina J. Curley & **Caroline R. Szczepanski**. “Single-Step, Kinetically Driven Hierarchical Wrinkle Formation in Photoinduced Phase Separating Free Radical Polymer Systems” Oral presentation, 2022 Fall Meeting of the American Chemical Society. Chicago, Illinois, USA, August 2022.
22. Denghao Fu & **Caroline R. Szczepanski**. “Methacrylate-based polymer network incorporating catechol moieties for dental adhesive application” Oral presentation, 2022 Fall Meeting of the American Chemical Society. Chicago, Illinois, USA, August 2022.
21. Alyssa VanZanten & **Caroline R. Szczepanski**. “Quantifying stress during swelling in patterned hydrogels” Poster presentation, 2022 Dept. Chemical Engineering & Materials Science Research Forum, Michigan State University, August 2022.
20. Karolina Colon Rivera, Alyssa VanZanten, & **Caroline R. Szczepanski**. “Hydrogel swelling: An investigation into the conditions that lead to instability” Poster presentation, 2022 Mid-Michigan Symposium for Undergraduate Research Experiences. East Lansing, MI, USA, July 2022.
19. Alyssa VanZanten & **Caroline R. Szczepanski**. “Quantifying Stress During Swelling in Patterned Hydrogels” Poster presentation, 2022 Engineering Graduate Research Symposium, Michigan State University, April 2022.
18. Sabrina J. Curley & **Caroline R. Szczepanski**. “Photoinduced Phase Separation in Free Radical Polymer Resins: Attaining Simultaneous Chemical and Physical Patterning for Complex Surface Generation” Poster presentation, 2022 Engineering Graduate Research Symposium, Michigan State University, April 2022. **Best Poster Award - Materials*
17. Denghao Fu & **Caroline R. Szczepanski**. “Improvement of Methacrylate-Based Polymer Networks by Introduction of Catechol Moieties” Poster presentation, 2022 Engineering Graduate Research Symposium, Michigan State University, April 2022.

16. Justin Hamlin, Md Nuruddin, Volodymyr Tarabara, & **Caroline R. Szczepanski**. “Incorporation of Cellulose Nanocrystals and Reactive Surfactant for Improved Performance of Pressure Sensitive Adhesives” Oral presentation, 2022 University Undergraduate Research and Arts Forum, Michigan State University, April 2022.
15. Allison Huckins, Sabrina J. Curley, & **Caroline R. Szczepanski**. “Soybean-Derived Photopolymer Resins: Characterization of Surface and Bulk Properties” Poster presentation, 2022 University Undergraduate Research and Arts Forum, Michigan State University, April 2022. **Awarded First Place Prize in Engineering, Computer Science & Mathematics Division*
14. Alyssa VanZanten & **Caroline R. Szczepanski**. “Investigating patterned hydrogel matrix instabilities during swelling” Oral presentation, 2022 March Meeting of the American Physical Society. Chicago, Illinois, USA, March 2022.
13. Kelsey-Ann Natasha Leslie, Robert Doane Solomon, Alyssa VanZanten, Shih-Yuan Chen, **Caroline R. Szczepanski**, & Michelle M. Driscoll. “Gel rupture and surface instabilities during dynamic swelling” Oral presentation, 2022 March Meeting of the American Physical Society. Chicago, Illinois, USA, March 2022.
12. Denghao Fu & **Caroline R. Szczepanski**. “Improvement of methacrylate-based polymer networks by introduction of catechol moieties” Poster presentation, 2021 Annual meeting of the Academy of Dental Materials (virtual), October 2021.
11. Sabrina J. Curley, Gabe Garbarz, Valeriy Ginzburg, & **Caroline R. Szczepanski**. “Effects of Crosslinking in Photopolymerized Methyl Methacrylate to Develop a Kinetic Model for Polymer Phase Separation Behavior” Poster presentation, 2021 Duke Soft Matter Symposium (virtual), October 2021.
10. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Influence of photoinitiator content on phase separation and microstructure of free-radical/cationic hybrid system and its application for low-gloss UV-curable coatings” Oral presentation, 2021 European Coatings Conference (virtual), September 2021.
9. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Impact of photoinitiator content on self-roughening surface induced by polymerization of free-radical/cationic hybrid systems and its application for low-gloss UV-curable coatings” Poster presentation, 2021 IUPAC Canadian Chemistry Conference and Exposition (virtual), August 2021.
8. Ryan Huynh, Alyssa VanZanten, & **Caroline R. Szczepanski**. “Patterning Hydrogels to form Surface Features during Swelling” Poster presentation, 2021 Mid-Michigan Symposium for Undergraduate Research Experiences (virtual), July 2021.
7. Sabrina J. Curley, Gabe Garbarz, & **Caroline R. Szczepanski**. “Effects of Crosslinking in Photopolymerized Methyl Methacrylate to Develop a Kinetic Model for Polymer Phase Separation Behavior” Poster presentation, 2021 Dept. Chemical Engineering & Materials Science Research Forum, Michigan State University (virtual), May 2021. **Awarded 2nd place in poster competition*
6. Sarah Beth Holles, Denghao Fu, & **Caroline R. Szczepanski**. “Understanding Phase Separation of Photopolymerized Dental Restorations” Poster presentation, 2021 University Undergraduate Research and Arts Forum, Michigan State University (virtual), April 2021.
5. Ingrid Calvez, **Caroline R. Szczepanski**, & Véronic Landry. “Impact of photoinitiator content on self-roughening surface induced by polymerization of free-radical/cationic hybrid systems and its application for low-gloss UV-curable coatings” Oral presentation, National Meeting of the American Chemical Society (virtual), March 2021.
4. Kelsey-Ann Leslie, **Caroline R. Szczepanski**, & Michelle M. Driscoll. “Birefringence of Polymer Gels Under Stress” Oral presentation, 2019 Undergraduate Research Expo,

Northwestern University, Evanston, Illinois, USA, May 2019.

***Awarded Best Oral Presentation in Advancements in Science and Engineering Division**

3. Avrati Agarawal & **Caroline R. Szczepanski**. “Analyzing Interfacial Features of Biomimetic Polymer Coatings” Poster presentation, 2019 Undergraduate Research Expo, Northwestern University, Evanston, Illinois, USA, May 2019.
2. Nicholas D. Wilson, **Caroline R. Szczepanski**, Carmem S. Pfeifer, & Jeffrey W. Stansbury. “Compositional drift and network formation in heterogeneous methacrylate materials.” Oral presentation, General Session of the International Association of Dental Research. San Diego, California, USA., March 2011.
1. Scott B. Crown, **Caroline R. Szczepanski**, & Patricia Darcy. “Rheology and Characterization of Reverse Micelles.” Poster presentation, 2008 AIChE Annual Meeting. Philadelphia, Pennsylvania, USA., November 2008.

GRADUATE STUDENT AND POSTDOCTORAL MENTORING

Michigan State University - Current Advisees

Sabrina J. Curley	2019–
<i>PhD Candidate, Materials Science & Engineering</i>	
Denghao Fu	2019–
<i>PhD Candidate, Materials Science & Engineering</i>	
Alyssa VanZanten	2020–
<i>PhD Student Materials Science & Engineering</i>	

Michigan State University - Former Advisees

Md Nuruddin	2020–2021
<i>Post-doctoral research associate</i>	
Ingrid Calvez	2020–2022
<i>Phd Student, Wood Sciences, Université Laval, Québec, Canada. Jointly supervised with Véronic Landry.</i>	

Graduate Student Committees

Gouree Kumbhar	2019–
<i>PhD Chemical Engineering, Michigan State University</i>	
Mayson Whipple	2021–
<i>PhD Chemical Engineering, Michigan State University</i>	
Yunlu Zhang	2022–
<i>PhD Materials Science & Engineering, Michigan State University</i>	
Elanna Neppel	2023–
<i>PhD Chemical Engineering, Michigan State University</i>	
Kevin Dunne	2023–
<i>MS Materials Science & Engineering, Michigan State University</i>	

Université Côte d’Azur - Former Advisees

Inès M’Jid	2016
<i>Master Student in Chemistry and Materials (MCM)</i>	
Lamine Dabo	2015
<i>Master Student in Chemistry and Materials (MCM)</i>	

UNDERGRADUATE MENTORING

Michigan State University - Current Advisees

Allison Huckins (Professorial Assistant)	2021–
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<i>BS Chemical Engineering, Class of 2025</i>	
Emily England (Professorial Assistant)	2021–
<i>BS Materials Science & Engineering, Class of 2024</i>	
William Gaal (Professorial Assistant)	2022–
<i>BS Chemical Engineering, Class of 2026</i>	
<i>Michigan State University - Former Advisees</i>	
Karolina Colon-Rivera (EnSURE Summer Researcher)	2022
<i>BS Chemical Engineering, Universidad Puerto Rico - Mayaguez, Class of 2024</i>	
Sarah Beth Holles (Undergraduate Research Assistant)	2020–2022
<i>BS Materials Science & Engineering, Class of 2022</i>	
Justin Hamlin (Professorial Assistant)	2020–2022
<i>BS Chemical Engineering, Class of 2024</i>	
Walter Kretzer (Undergraduate Research Assistant)	2022
<i>BS Chemical Engineering, Class of 2025</i>	
Gabe Garbarz (Professorial Assistant)	2019–2021
<i>BS Chemical Engineering, Class of 2023</i>	
Ryan Huynh (EnSURE Summer Researcher)	2021
<i>BS Chemical Engineering, Class of 2022</i>	
<i>Northwestern University - Former Advisees</i>	
Crestelynn Ligo (URAP)	2019
<i>BS Chemical & Biological Engineering, Class of 2022</i>	
Avrati Agarawal (URAP)	2019
<i>BS Chemical & Biological Engineering, Class of 2022</i>	
Kelsey-Ann Leslie (URAP)	2018–2019
<i>BS Biomedical Engineering, Class of 2022</i>	
Jules Gilligan (URAP)	2018
<i>BS Chemical & Biological Engineering, Class of 2022</i>	
<i>University of Colorado at Boulder - Former Advisees</i>	
Connor Carrol	2014
<i>BS Chemical & Biological Engineering, Class of 2015</i>	
Sean Tadjeran	2013
<i>BS Chemical & Biological Engineering</i>	
Amy Le	2011
<i>BS Chemical & Biological Engineering</i>	
Gregory Howard	2010–2011
<i>BS Chemical & Biological Engineering</i>	
SERVICE TO MY INSTITUTION	
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<i>Michigan State University</i>	
Polymer journal club organizer	2021–
<i>co-organized with Robert Ferrier and Shiwang Cheng</i>	
Presentation judge, Undergraduate University Arts & Research Forum	2021–
Presentation judge, Engineering Graduate Research Symposium	2022–
CHE Student Recruitment	2020–
<i>Alumni Distinguished Scholars, WIE Major Days, Engineering Connect, Engineering Preview Day</i>	
CHEMS Department Seminar, Organizing committee member	2020–

Honors College, Fireside Chat Host	2021
<i>Biomimicry in Engineering</i>	
Grievance panel member, Office of the Ombudsperson	2020
<i>Northwestern University</i>	
Faculty Representative, American Association of University Women (AAUW)	2018–2019
Undergraduate Research Exposition, poster judge	2018–2019
<i>University of Colorado at Boulder</i>	
Graduate Leadership Council Co-Chair	2013–2014
Graduate Student Representative	2011–2012
Graduate Student Mentor	2010–2012

SERVICE TO MY PROFESSION
Academic journal referee

RSC Advances, Macromolecules, Journals of the American Chemical Society, Materials, Dentistry, Journal of Applied Polymer Science, Nanomaterials, International Journal of Molecular Sciences, International Journal of Paediatric Dentistry, Industrial & Engineering Chemistry Research, ACS Applied Polymer Materials, Gels, Materials Letters, Materials Science, Journal of Chemical Physics

Grant program reviewing

NSF Interfacial Engineering (2021), NSF Graduate Research Fellowship Program (2021), American Chemical Society Petroleum Research Fund (2021), NIH Oral, Dental and Craniofacial Sciences Early Career Reviewer (2020)

Conference service

AIChE National Meeting, session chair and organizer	2021–
<i>Polymer Thin Films, Confinement, and Interfaces (I & II) (2021)</i>	
<i>Polymer Coatings (2021)</i>	
<i>Sustainable & Bioinspired Composites (2022, 2023)</i>	
<i>Materials Engineering & Science (Polymers) Poster Session (2022)</i>	
<i>Polymer Networks & Gels (2023)</i>	
N.I.C.E. Conference on Biobased Chemistry and Materials, Organizing Committee	2016–
American Association of Dental, Oral, & Craniofacial Research (AADOCR), Session chair	2022
Adhesion Society, Poster session judge	2022
AIChE National Meeting, MESD poster session judge	2021
Mid-Michigan Symposium for Undergraduate Research, poster session judge	2021
AIChE National Meeting, Undergraduate poster session judge	2018
N.I.C.E. Conference on Biobased Chemistry and Materials, Session Chair	2018
AIChE Midwest Regional Conference, Session Chair	2018

Professional organization membership

American Institute of Chemical Engineers	2008–
American Chemical Society	2011–
Academy of Dental Materials	2019–
American Physical Society	2020–
International Association of Oral, Dental and Craniofacial Research	2021–
Adhesion Society	2021–

 PUBLIC OUTREACH & DEI EFFORTS

Michigan State University

AICHe Women in Chemical Engineering Community, Vice Chair	2023
AICHe Women in Chemical Engineering Community, Fall Programming Chair	2022
Women in Engineering - Introduce a girl to Engineering, workshop organizer	2022
Spartan Girls Math and Science Day, workshop organizer	2020

Northwestern University

AAUW Salary Negotiation Workshop Organizer	2019
<i>Organized a salary negotiation workshop for students at staff at Northwestern University</i>	
Biotechnology Day, workshop organizer	2018
Society of Women Engineers (SWE) Career Day for Girls, volunteer	2018

University of Colorado at Boulder

Expanding Your Horizons Conference, Conference coordinator	2011–2013
Expanding Your Horizons Conference, volunteer	2010–2011
APP Tutor, AP Chemistry	2010–2011

 LABORATORY SKILLS

Proficient with:

Goniometry, Electrodeposition, Atmospheric Plasma Activation, Optical Profilometry, Parallel Plate Rheometer, Dynamic Mechanical Thermal Analysis, ThermoGravimetric Analysis, Gel Permeation Chromatography, Differential Scanning Calorimetry, Fourier-Transform Infrared Spectroscopy, Scanning Electron Microscopy, UV/Vis Spectroscopy, Gas Pycnometer, Cantilever Mode Tensometer, Hydraulic Universal Test System for Three-Point Bending, Refractometer, Linometer, Polarized Light Microscopy, Confocal Microscopy, Atomic Force Microscopy, Ellipsometry.

 LANGUAGES

English: Native**Spanish:** ILR Level 3, CERL Level B2**French:** ILR Level 3, CERL Level C1