

Ryan C. Hayward
Curriculum Vitae

Department of Chemical and Biological Engineering
University of Colorado Boulder
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Education:

University of California, Santa Barbara, Ph.D., Chemical Engineering, 2004
Thesis Advisors: Prof. Edward J. Kramer, Prof. Bradley F. Chmelka
Thesis Title: *Mesostructured Inorganic Films from Self-Assembled Templates: Control of Morphology from the Molecular to the Macroscopic Scale*

Princeton University, B.S.E., Chemical Engineering, 1999, Summa Cum Laude
Research Advisors: Prof. Ilhan A. Aksay, Prof. Dudley A. Saville
Thesis Title: *Assembly and Patterning of Colloidal Crystals*

Professional Positions:

University of Colorado, Boulder, CO
James and Catherine Patten Endowed Professor of Chemical and Biological Engineering,
8/2020 - present
Program Affiliated Faculty, Materials Science and Engineering Program, 8/2020 - present
Visiting Professor, 1/2020 - 8/2020

University of Massachusetts, Amherst, MA
Adjunct Professor of Polymer Science & Engineering, 9/2021 - present
Professor of Polymer Science & Engineering, 1/2015 – 8/2021 (on leave 9/2020-8/2021)
Associate Professor of Polymer Science & Engineering, 2012 – 2015
Assistant Professor of Polymer Science & Engineering, 2006 – 2012

Harvard University, Cambridge, MA
Postdoctoral Fellow, Division of Engineering & Applied Sciences, 2004 – 2005
Research advisor: David A. Weitz

University of California, Santa Barbara
Sabbatical Leave, 2015
Research and Teaching Assistant, Chemical Engineering, 1999-2004

Editorial Positions:

Associate Editor, *ACS Macro Letters*, 2013 - 2022

Awards & Honors:

Department of Chemical and Biological Engineering Service Award	2021
NSF Special Creativity Extension	2019
Fellow of the American Physical Society	2018
Blavatnik National Award Finalist, Physical Sciences and Engineering	2018

Chaire Michelin, Visiting Professorship at ESPCI	2016
Dudley A. Saville Lecturer, Princeton University	2014
American Physical Society John H. Dillon Medal	2014
Journal of Polymer Science Innovation Award	2013
ACS Division of Colloid and Surface Chemistry Unilever Award	2011
Department of Energy Early Career Award	2011
Presidential Early Career Award for Scientists and Engineers	2010
3M Nontenured Faculty Award	2009 - 2011
ACS PRF Doctoral New Investigator Award	2009
National Science Foundation CAREER Award	2008
University of California Executive Vice Chancellor's Fellowship	2003
Corning Fellowship in Materials Research	2002
University of California Chancellor's Fellowship	1999-2004
National Science Foundation Graduate Research Fellowship	1999-2002
AIChE Award for Overall Excellence in Chemical Engineering	1999
Xerox Prize for Outstanding Senior Thesis Research	1999
James Hayes-Edgar Palmer Prize	1999
Phi Beta Kappa	1999
Sigma Xi National Scientific Research Honor Society	1999
AIChE Outstanding Junior Award	1998
Tau Beta Pi Honor Society	1998
George B. Wood Legacy Sophomore Prize	1997

Professional Societies:

American Physical Society
 American Chemical Society
 American Institute of Chemical Engineers
 Materials Research Society

List of Publications (* = corresponding author)

Peer Reviewed:

150. M. Berry, D. Limberg, M.E. Lee-Trimble, R.C. Hayward, C.D. Santangelo, "Controlling the configuration space topology of mechanisms", submitted (2022). <https://arxiv.org/abs/2205.10180>
149. H. Zhou, A.S. Kuenstler, W. Xu, M. Hu, R.C. Hayward*, "A semicrystalline poly(azobenzene) exhibiting room temperature light-induced melting, crystallization, and alignment", *Macromolecules* (2022). DOI: 10.1021/acs.macromol.2c01576
148. J.J.G. Campos, F. Sticker, K.D. Clark, M. Park, S.J. Bailey, A.S. Kuenstler, R.C. Hayward, J. Read de Alaniz, "Controlled diels-alder "click" strategy to access mechanically aligned main-chain liquid crystal networks", *Angewandte Chemie International Edition*, e202214339 (2022). DOI: 10.1002/anie.202214339
147. M. Berry, Y. Kim, D. Limberg, R.C. Hayward, C.D. Santangelo*, "Mechanical signaling cascades", *Physical Review Research*, 106, 4 (2022). DOI: 10.1103/PhysRevE.106.044212
146. E. Thomas, H. Fu, R.C. Hayward, A.J. Crosby*, "Geometry-controlled instabilities for soft-soft adhesive interfaces", *Soft Matter*, 18, 8098-8105 (2022). DOI: 10.1039/D2SM00808D

145. M.E. Lee-Trimble, J.-H. Kang, R.C. Hayward, C.D. Santangelo*, “Robust Folding of Elastic Origami”, *Soft Matter* (2022). DOI: 10.1039/D2SM00369D <https://arxiv.org/abs/2109.10989v2>
144. N. Tanjeem and D.M. Hall, M.B. Minnis, R.C. Hayward*, G.M. Grason*, “Focussing frustration for self-limiting assembly of flexible, curved particles”, *Physical Review Research*, 4, 033035 (2022). DOI: 10.1103/PhysRevResearch.4.033035
143. A.J. Berges, W. Li, W. Xu, F. Tong, R.O. Al-Kaysi, R.C. Hayward, C.J. Bardeen*, “Photomechanical Structures Based on Porous Alumina Templates Filled with 9-Methylanthracene Nanowires”, *Crystals*, 12, 808 (2022). DOI: 10.3390/cryst12060808
142. Y. Chen, A.S. Kuentler, R.C. Hayward, L. Jin*, “Formation of rolls from liquid crystal elastomer bistraps”, *Soft Matter*, 18, 4077-4089 (2022). DOI: 10.1039/D1SM01830B
141. A. Kulshreshtha, R.C. Hayward, A. Jayaraman*, “Impact of Composition and Placement of Hydrogen Bonding Groups along Polymer Chains on Blend Phase Behavior: Coarse-Grained Molecular Dynamics Simulation Study” *Macromolecules*, 55, 2675–2690 (2022). DOI: 10.1021/acs.macromol.2c00055.
140. D. Limberg, J.-H. Kang, R.C. Hayward*, “Triplet–Triplet Annihilation Photopolymerization for High-Resolution 3D Printing”, *JACS*, 144, 12, 5226-5232 (2022). DOI: 10.1021/jacs.1c11022
139. Y. Wang, K. Jia, S. Zhang, H.J. Kim, Y. Bai, R.C. Hayward*, Z. Suo*, “Temperature sensing using junctions between mobile ions and mobile electrons”, *PNAS*, 119, e217962119 (2022). DOI: 10.1073/pnas.2117962119
138. N. Tanjeem, M. Minnis, R.C. Hayward*, C.W. Shields IV*, “Shape-Changing Particles: From Materials Design and Mechanisms to Implementation”, *Advanced Materials*, 34, 2105758 (2021). DOI: 10.1002/adma.202105758
137. M. Lee, S. Perry, R.C. Hayward*, “Complex Coacervation of Polymerized Ionic Liquids in Non-Aqueous Solvents”, *ACS Polymers Au*, 1, 100 (2021). DOI: 10.1021/acspolymersau.1c00017
136. R. Selhorst, J. Gaitor, M. Lee, D. Markovich, Y. Yu, M. Treichel, C. Olavarria Gallegos, T. Kowalewski, L.F. Kourkoutis, R.C. Hayward, K.J.T. Noonan*, “Multiblock Copolymer Anion-Exchange Membranes Derived from Vinyl Addition Polynorbornenes”, *ACS Applied Energy Materials*, 4, 10273 (2021). DOI: 10.1021/acsaem.1c02094
135. H. Kim, S. Sundaram, N. Tanjeem, J.-H. Kang, T. Emrick*, R.C. Hayward*, “Coupled Oscillation and Spinning of Photothermal Particles in Marangoni Optical Traps”, *PNAS*, 118, e2024581118 (2021). DOI: 10.1073/pnas.2024581118.
134. K.R. Chalek, X. Dong, F. Tong, R.A. Kudla, L. Zhu, A.D. Gill, W. Xu, C. Yang, J.D. Hartman, A. Magalhães, R.O. Al-Kaysi, R.C. Hayward, R.J. Hooley, G.J.O. Beran, C.J. Bardeen*, L.J. Mueller*, “Bridging Photochemistry and Photomechanics with NMR Crystallography: the Molecular Basis for the Macroscopic Expansion of an Anthracene Ester Nanorod”, *Chemical Science*, 21, 453-456 (2021). DOI: 10.1039/D0SC05118G
133. A.S. Kuentler, M. Lahikainen, H. Zhou, W. Xu, A. Priimagi*, R.C. Hayward*, “Reconfiguring Gaussian Curvature of Hydrogel Sheets with Photo-Switchable Host-Guest Interactions”, *ACS Macro Letters*, 9, 1172-1177 (2020). DOI: 10.1021/acsmacrolett.0c00469
132. D. Zeng, R. Gupta, E.B. Coughlin, R.C. Hayward*, “Assembly of Disordered Cocontinuous Morphologies by Multiblock Copolymers with Random Block Sequence and Length Dispersity”, *ACS Applied Polymer Materials*, 2, 3282-3290 (2020). DOI: 10.1021/acsapm.0c00428
131. S.-W. Oh, T. Guo, A.S. Kuentler, R.C. Hayward, P. Palfy-Muhoray*, X. Zheng, “Measuring the five elastic constants of a nematic liquid crystal elastomer”, *Liquid Crystals* 48, 511-520 (2020). DOI: 10.1080/02678292.2020.1790680
130. A.S. Kuentler, K.D. Clark, J. Read de Alaniz, R.C. Hayward*, “Reversible Actuation via Photoisomerization-Induced Melting of a Semicrystalline Poly(Azobenzene)”, *ACS Macro Letters*, 9, 902-909 (2020). DOI: 10.1021/acsmacrolett.0c00328

129. H.J. Kim, L. Paquin, C.W. Barney, S. So, B. Chen, Z. Suo*, A.J. Crosby*, R.C. Hayward*, “Low-Voltage Reversible Electro-Adhesion of Ionoelastomer Junctions”, *Advanced Materials* 32, 2000600 (2020). DOI: 10.1002/adma.202000600
128. K. Korner, A.S. Kuentler, R.C. Hayward, B. Audoly, K. Bhattacharya, "A nonlinear beam model for photomotile structures", *Proceedings of the National Academy of Sciences*, 117, 9762-9770 (2020). DOI: 10.1073/pnas.1915374117
127. A.S. Kuentler, Y. Chen, P. Bui, H. Kim, A. DeSimone*, L. Jin*, R.C. Hayward*, “Blueprinting Photothermal Shape-Morphing of Liquid Crystal Elastomers”, *Advanced Materials*, 32, 2000609 (2020). DOI: 10.1002/adma.202000609
126. H. Kim, N. Hight-Huf, J.-H. Kang, P. Bisnoff, S. Sundararajan, T. Thompson, M. Barnes*, R.C. Hayward*, T. Emrick “Polymer Zwitterions for Stabilization of CsPbBr₃ Perovskite Nanoparticle and Nanocomposite Films”, *Angewandte Chemie International Edition* 59, 10802-10806 (2020). DOI: 10.1002/anie.201916492
125. H. J. Kim, B. Chen, Z. Suo*, R.C. Hayward*, “Ionoelastomer junctions between polymer networks of fixed anions and cations”, *Science*, 367, 773-776 (2020). DOI: 10.1126/science.aay8467
124. F. Tong, W. Xu, T. Guo, B. F. Lui, R.C. Hayward, P. Palffy-Muhoray, R.O. Al-Kaysi,* C.J. Bardeen*, “Photomechanical molecular crystals and nanowire assemblies based on the [2+2] photodimerization of a phenylbutadiene derivative”, *J. Mater. Chem. C*, 8, 5036–5044 (2020). DOI: 10.1039/c9tc06946a
123. T. Ouchi, R.C. Hayward*, “Harnessing multiple surface deformation modes for switchable conductivity surfaces”, *ACS Applied Materials & Interfaces*, 12, 10031–10038 (2020). DOI: 10.1021/acsami.9b22662
122. S.J. Jeon, R.C. Hayward*, “Simultaneous control of Gaussian curvature and buckling direction by swelling of asymmetric trilayer hydrogel hybrids”, *Soft Matter*, 16, 688–694 (2020). DOI: 10.1039/c9sm01922g
121. D.E. Acevedo-Cartagena, J. Zhu, M. Kocun, S.S. Nonnenmann, R.C. Hayward*, “Tuning metastability of poly(3-hexyl thiophene) solutions to enable in situ atomic force microscopy imaging of surface nucleation”, 52, 7756–7761, *Macromolecules* (2019). DOI: 10.1021/acs.macromol.9b01547
120. Y. Zhou, C.M. Duque, C.D. Santangelo, R.C. Hayward*, “Biasing buckling direction in shape-programmable hydrogel sheets with through-thickness gradients” *Advanced Functional Materials*, 29, 1905273 (2019). DOI: 10.1002/adfm.201905273
119. J.-H. Kang, H. Kim, C.D. Santangelo, R.C. Hayward*, “Enabling Robust Self-folding Origami by Pre-Biasing Vertex Buckling Direction”, *Advanced Materials*, 31, 1903006 (2019). DOI: 10.1002/adma.201903006
118. H. Nie, J.L. Self, A.S. Kuentler, R.C. Hayward, J. Read de Alaniz*, “Multi-Addressable Photochromic Architectures: From Molecules to Materials”, *Advanced Optical Materials*, 7, 1900224 (2019). DOI: 10.1002/adom.201900224
117. H. Kim, J.-H. Kang, Y. Zhou, A.S. Kuentler, Y. Kim, C. Chen, T. Emrick*, R.C. Hayward*, “Light-Driven Shape Morphing, Assembly, and Motion of Nanocomposite Gel Surfers”, *Advanced Materials* 31, 1900932 (2019). DOI: 10.1002/adma.201900932
116. A.S. Kuentler, H. Kim, R.C. Hayward*, “Liquid crystal elastomer waveguide actuators”, *Advanced Materials*, 31, 1901216 (2019). DOI: 10.1002/adma.201901216
115. Q. Liu, T. Ouchi, R.C. Hayward, Z. Suo, “Elastocapillary crease”, *Physical Review Letters*, 122, 098003 (2019). DOI: 10.1103/PhysRevLett.122.098003

114. D. Zeng, R.C. Hayward*, “Effects of Randomly End-Linked Copolymer Network Parameters on the Formation of Disordered Cocontinuous Phases”, *Macromolecules*, **52**, 2642–2650 (2019). DOI: 10.1021/acs.macromol.9b00050
113. A. Kuenstler, R.C. Hayward*, “Light-Induced Shape Morphing of Thin Films”, *Current Opinion in Colloid and Interface Science*, **40**, 70-86 (2019). DOI: 10.1016/j.cocis.2019.01.009
112. H. Kim, S. So, A. Ribbe, Y., W. Hu, V.V. Duzhko, R.C. Hayward*, T. Emrick*, “Functional Polymers for Stabilizing CsPbBr₃ Perovskite Nanoparticles”, *Chemical Communications*, **55**, 1833-1836 (2019). DOI: 10.1039/C8CC09343A
111. A. Sathyan, R.C. Hayward*, T. Emrick* "Ring-Opening Polymerization of Allyl-Functionalized Lactams", *Macromolecules*, **52**, 167-175 (2019). DOI: 10.1021/acs.macromol.8b02148
110. A. Auguste, J. Yang, L. Jin, D. Chen, Z. Suo*, R.C. Hayward*, “Formation of high aspect ratio wrinkles and ridges on elastic bilayers with small thickness contrast”, *Soft Matter*, **14**, 8545 – 8551 (2018). DOI: 10.1039/c8sm01345d
109. N. Bende, T. Yu, N.A. Corbin, M.A. Dias, C.D. Santangelo, J.A. Hanna*, R.C. Hayward*, "Overcurvature-induced multi-stability of conical frusta: How a ‘bendy straw’ holds its shape", *Soft Matter*, **14**, 8636 – 8642 (2018). DOI: 10.1039/C8SM01355A
108. A.W. Hauser, S. Sundaram, R.C. Hayward*, “Photothermocapillary oscillators”, *Physical Review Letters*, **121**, 158001 (2018). DOI: 10.1103/PhysRevLett.121.158001
107. W. Huang, R.C. Hayward*, “Orthogonal Ambipolar Semiconductors with Inherently Multi-Dimensional Response for the Discriminative Sensing of Chemical Vapors”, *ACS Applied Materials & Interfaces*, **10**, 33353-33359 (2018). DOI: 10.1021/acsami.8b10789
106. T. Ouchi, J. Yang, Z. Suo, R.C. Hayward*, “The effects of stiff film pattern geometry on surface buckling instabilities of elastic bilayers”, *ACS Applied Materials & Interfaces*, **10**, 23406–23413 (2018). DOI: 10.1021/acsami.8b04916
105. D. Zeng, A. Ribbe, H. Kim, R.C. Hayward*, “Stress-induced Orientation of Co-continuous Nanostructures within Randomly End-linked Copolymer Networks”, *ACS Macro Letters*, **7**, 828 – 833 (2018). DOI: 10.1021/acsmacrolett.8b00453
104. K. Heo, C. Miesch, J.-H. Na, T. Emrick, R.C. Hayward*, “Assembly of P3HT/CdSe nanowire networks in an insulating polymer host”, *Soft Matter* **14**, 5327 – 5332 (2018). DOI: 10.1039/C8SM01001C
103. R.A. Letteri, C.F. Santa Chalarca, Y. Bai, R.C. Hayward*, T. Emrick*, “Forming Sticky Droplets from Slippery Polymer Zwitterions”, *Advanced Materials*, **29**, 1702921 (2017). DOI: 10.1002/adma.201702921
102. S. Sundaram*, D.S. Kim, M.A. Baldo, R.C. Hayward, W. Matusik, "3D-Printed Self-Folding Electronics" *ACS Applied Materials and Interfaces*, **9**, 32290-32298 (2017). DOI: 10.1021/acsami.7b10443
101. D. Zeng, A. Ribbe, R.C. Hayward*, “Anisotropic and Interconnected Nanoporous Materials from Randomly End-linked Copolymer Networks”, *Macromolecules* **50**, 4668-4676 (2017). DOI: 10.1021/acs.macromol.7b00007
100. S. So, R.C. Hayward*, “Tunable Upper Critical Solution Temperature of Poly(N-isopropylacrylamide) in Ionic Liquids for Sequential and Reversible Self-Folding”, *ACS Applied Materials & Interfaces*, **9**, 15785-15790 (2017). DOI: 10.1021/acsami.7b02953
99. S.-J. Jeon, A.W. Hauser, R.C. Hayward*, “Shape Morphing Materials from Stimuli-Responsive Hydrogel Hybrids”, *Accounts of Chemical Research*, **50**, 161-169 (2017). [Invited submission to special issue on stimuli-responsive hydrogels]
98. J. Bae, N.P. Bende, A.A. Evans, J.-H. Na, C.D. Santangelo*, R.C. Hayward*, “Programmable and reversible assembly of soft capillary multipoles”, *Materials Horizons*, **4**, 228-235(2017). DOI: 10.1039/c6mh00531d

97. S.-J. Jeon, R.C. Hayward*, “Reconfigurable micro-scale frameworks from concatenated helices with controlled chirality”, *Advanced Materials*, **26**, 1606111 (2017). DOI: 10.1002/adma.201606111
96. S.P. Ertem, B.R. Caire, T.-H. Tsai, D. Zeng, M.A. Vandiver, A. Kusoglu, S. Seifert, R.C. Hayward, A.Z. Weber, A.M. Herring, E.B. Coughlin*, M.W. Liberatore*, “Ion transport properties of mechanically stable symmetric ABCBA pentablock copolymers with quaternary ammonium functionalized midblock”, *Journal of Polymer Science B-Polymer Physics*, **55**, 612-622 (2017). DOI: 10.1002/polb.24310
95. Y. Kim, H.J. Kim, J.-S. Kim, R.C. Hayward*, B.J. Kim*, “Architectural Effects on Solution Self Assembly of Conjugated Rod-Coil Poly(3-hexylthiophene)-graft-poly(2-vinylpyridine) Copolymers”, *ACS Applied Materials & Interfaces* (2017). DOI: 10.1021/acsami.6b12193
94. A. Auguste, L. Jin, Z. Suo*, R.C. Hayward*, “Post-wrinkle bifurcations in elastic bilayers with modest contrast in modulus” *Extreme Mechanics Letters* **11**, 30-36 (2017). DOI: 10.1016/j.eml.2016.11.013
93. W. Huang, J.C. Markwart, A.L. Briseno*, R.C. Hayward*, “P3HT/PDI shish kebabs: orthogonal ambipolar semiconductors for complementary logic gates”, *ACS Nano* **10**, 8610-8619 (2016). DOI: 10.1021/acsnano.6b03942
92. K.H. Ku, J. Shin, D. Klinger, S.G. Jang, R.C. Hayward, C.J. Hawker, B.J. Kim*, “Particles with Tunable Porosity and Morphology by Controlling Interfacial Instability in Block Copolymer Emulsions”, *ACS Nano* **10**, 5243-5251(2016). DOI: 10.1021/acsnano.6b00985
91. Y. Zhou, A.W. Hauser, N.P. Bende, M.G. Kuzyk, R.C. Hayward*, “Waveguiding microactuators based on a photothermally responsive nanocomposite hydrogel”, *Advanced Functional Materials* **26**, 5447-5452 (2016). DOI: 10.1002/adfm.201601569
90. J.-H. Na, N.P. Bende, J. Bae, C.D. Santangelo, R.C. Hayward*, “Grayscale gel lithography for programmed buckling of non-Euclidean hydrogel plates”, *Soft Matter*, **12**, 4985-4990 (2016). DOI: 10.1039/C6SM00714G
89. B. Xu, Q. Liu, Z. Suo*, R.C. Hayward*, “Reversible electrochemically-triggered delamination blistering of hydrogel films on micro patterned electrodes”, *Advanced Functional Materials* **26**, 3218-3225 (2016), DOI: 10.1002/adfm.201504769.
88. A.W. Hauser, D. Liu, K.C. Bryson, R.C. Hayward*, D.J. Broer*, "Reconfiguring Nanocomposite Liquid Crystal Polymer Films with Visible Light", *Macromolecules* **49**, 1575-1581 (2016). DOI: 10.1021/acs.macromol.6b00165
87. S.-J. Jeon, M.C. Chiappelli, R.C. Hayward*, “Photo-crosslinkable nanocomposite multilayers for responsive 1D photonic crystals”, *Advanced Functional Materials* **26**, 722-728 (2016). DOI: 10.1002/adfm.201503727
86. C.-C. Chang, R. Letteri, R.C. Hayward*, T. Emrick*, “Functional Sulfobetaine Polymers: Synthesis and Salt-Responsive Stabilization of Oil-in-Water Droplets”, *Macromolecules*, **48**, 7843-7850 (2015). DOI: 10.1021/acs.macromol.5b01861
85. D. Chen, C.-C. Chang, B. Cooper, A. Silvers, T. Emrick*, R.C. Hayward*, “Photo-patternable Biodegradable Aliphatic Polyester with Pendent Benzophenone Groups”, *Biomacromolecules*, **16**, 3329-3335 (2015). DOI: 10.1021/acs.biomac.5b00991
84. H.J. Kim, M. Skinner, A.L. Briseno, T. Emrick, B.J. Kim*, R.C. Hayward*, “Water Processable Polythiophene Nanowires by Photo-crosslinking and Click-functionalization”, *Nano Letters*, **15**, 5689-5695 (2015). DOI: 10.1021/acs.nanolett.5b01185
83. A.W. Hauser, R.C. Hayward*, “Random photografting of polymers to nanoparticles for well-dispersed nanocomposites”, *Journal of Polymer Science B* **54**, 152-158 (2015). DOI: 10.1002/polb.23803

82. J. Bae, T. Ouchi, R.C. Hayward*, “Measuring the elastic modulus of thin polymer sheets by elastocapillary bending”, *ACS Applied Materials and Interfaces*, **7**, 14734-14742 (2015). DOI: 10.1021/acsami.5b02567
81. K.C. Bryson, T.I. Lobling, A.H.E. Mueller*, T.P. Russell*, R.C. Hayward*, “Using Janus Nanoparticles to Trap Polymer Blend Morphologies during Solvent-Evaporation-Induced Demixing”, *Macromolecules* **48**, 4220-4227 (2015). DOI: 10.1021/acs.macromol.5b00640 [Selected as ACS Editors Choice Article]
80. L. Jin, A. Auguste, R.C. Hayward*, Z. Suo*, “Bifurcation diagrams for the formation of wrinkles or creases in soft bilayers”, *Journal of Applied Mechanics* **82**, 061008 (2015). DOI: 10.1115/1.4030384
79. D.E. Acevedo-Cartagena, E. Trabanino, E. Pentzer, T. Emrick, A. Briseno*, R.C. Hayward*, “Selective nucleation of poly(3-hexyl thiophene) nanofibers on multilayer graphene substrates”, *ACS Macro Letters* **4**, 483-487 (2015). DOI: 10.1021/acsmacrolett.5b00038
78. A.W. Hauser, A.A. Evans, J.-H. Na, R.C. Hayward*, “Photothermally-Reprogrammable Buckling of Nanocomposite Gel Sheets”, *Angewandte Chemie International Edition*, **54**, 5434-5437 (2015). DOI: 10.1002/anie.201412160
77. J.L. Silverberg*, J.-H. Na, A.A. Evans, B. Liu, T. Hull, C.D. Santangelo, R.J. Lang, R.C. Hayward, I. Cohen, “Critical transition to bistability arising from hidden degrees of freedom in origami structures”, *Nature Materials*, **14**, 389-33 (2015).
76. L. Bu, T.J. Dawson, R.C. Hayward*, “Tailoring Ultrasound-Induced Growth of Perylene Diimide Nanowire Crystals from Solution by Modification with Poly(3-hexyl thiophene)”, *ACS Nano* **9**, 1878-1885 (2015). DOI: 10.1021/nn506795q
75. D. Chen, R. Hyldahl, R.C. Hayward*, “Creased hydrogels as active platforms for mechanical deformation of cultured cells”, *Lab on a Chip*, **15**, 1160-1167, (2015). DOI: 10.1039/C4LC01296H
74. C.N. Walker, K. Bryson, R.C. Hayward*, G.N. Tew*, “Wide Bicontinuous Compositional Windows from Co-Networks Made with Telechelic Macromonomers”, *ACS Nano* **8**, 12376-12385 (2014). DOI: 10.1021/nn505026a
73. B.A.G. Hammer, M.A. Reyes-Martinez, F.A. Bokel, F. Liu, T.P. Russell, A.L. Briseno, R.C. Hayward, T. Emrick*, “Robust Polythiophene Nanowires Cross-linked with Functional Fullerenes”, *Journal of Materials Chemistry C*, **2**, 9674-9682 (2014). DOI: 10.1039/C4TC01898B
72. N. Bende, A.A. Evans, S. Innes-Gold, L. Marin, I. Cohen, R.C. Hayward*, C.D. Santangelo*, “Geometrically controlled snapping transitions in shells with curved creases”, *Proceedings of the National Academy of Sciences*, **112**, 11175-11180 (2015). DOI: 10.1073/pnas.1509228112
71. M.C. Chiappelli, A. Ribbe, A.W. Hauser, R.C. Hayward*, “Photonic polymer multilayers for colorimetric radiation sensing”, *Sensors and Actuators B*, **208**, 85-89 (2014). DOI: 10.1016/j.snb.2014.10.113
70. J.-H. Na, A.A. Evans, J. Bae, M.C. Chiappelli, C.D. Santangelo, R.J. Lang, T. Hull, R.C. Hayward*, “Programming reversibly self-folding origami with micropatterned photo-crosslinkable polymer trilayers”, *Advanced Materials* **27** 79-85 (2015). DOI: 10.1002/adma.201403510
69. D. Chen, J. Yoon, D. Chandra, A.J. Crosby*, R.C. Hayward*, “Stimuli responsive buckling mechanics of polymer films”, *Journal of Polymer Science B*, **52**, 1441-1461 (2014) DOI: 10.1002/polb.23590 [Invited review article]
68. J. Bae, C.D. Santangelo*, R.C. Hayward*, “Edge-defined metric buckling of temperature-responsive hydrogel ribbons and rings”, *Polymer*, **55** 5908-5914 (2014) DOI:

10.1016/j.polymer.2014.08.033 [Invited contribution to special issue on Shape Morphing Polymers]

67. A. Auguste, L. Jin, Z. Suo*, R.C. Hayward*, “The role of substrate pre-stretch in post-wrinkling bifurcations”, *Soft Matter*, **10**, 6520-6529 (2014). DOI: 10.1039/C4SM01038H
66. N.P. Bende, R.C. Hayward, C.D. Santangelo*, “Nonuniform growth and topological defects in the shaping of elastic sheets”, *Soft Matter*, **10**, 6382-6386 (2014). DOI: 10.1039/C4SM00845F
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Media coverage:

- “Using ions to connect life to machines”, *Chemistry World*, Aug. 24, 2020
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Patents:

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9. H. Kim, R.C. Hayward, T. Emrick, *Polymer-perovskite nanoparticle composite and method for the manufacture thereof*, Patent Application No. 62/871,853 (Filed with US PTO Jul. 9, 2019).
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2. A.J. Crosby, E.P. Chan, R.C. Hayward, *Wrinkled adhesive surfaces and methods for the preparation thereof*, US Patent No 8,906,284, (December 9, 2014).
1. R.C. Hayward, H.F. Poon, Y. Xiao, D.A. Saville, I.A. Aksay, *Electrohydrodynamically patterned colloidal crystals*, US Patent No. 6533903, 2003.

List of Presentations

Invited Lectures:

182. "Photochemically-Driven Shaping of Thin Hydrogel Sheets Containing Light-Sensitive Supramolecular Complexes", Fall MRS Meeting, Boston, MA, 11/29/22
181. "Driving deformation, assembly, and coupled motion of polymers with light", University of Wisconsin, Madison, Materials Science and Engineering, 9/22/22
180. "Electro-mechanically responsive ionoelastomer heterojunctions", Spring MRS Meeting, Honolulu, HI, 5/13/22
179. "Driving deformation, assembly, and coupled motion of polymers with light", Pennsylvania State University, Chemical Engineering, 4/5/22
178. "Driving deformation, assembly, and coupled motion of polymers with light", Northwestern University, Materials Science and Engineering, 1/18/22
177. "Light-induced deformation of hybrid polymer/crystal photomechanical materials", Pacificchem, 12/19/21
176. "Driving deformation, assembly, and coupled motion of polymers with light", University of Houston, Chemical and Biomolecular Engineering, 10/29/21
175. "Electro-adhesion of soft ion-conducting 'ionoelastomer' heterojunctions", Virtual Adhesion Science Gathering, 9/23/21
174. "Light-driven collective motion of patterned nanocomposite hydrogel sheets at air/water interfaces", American Chemical Society Fall Meeting (Virtual), 8/23/21
173. "Light-induced deformation of hybrid polymer/crystal photomechanical materials", American Chemical Society Fall Meeting (Virtual), 8/22/21
172. "Light-induced deformation of hybrid polymer/crystal photomechanical materials", IEEE Rapid Meeting (Virtual), 8/2/21
171. "Light-induced melting, recrystallization, and two-way shape memory of semicrystalline poly(azobenzene)s", Future of Polymer Chemistry Symposium - KAIST (Virtual), 7/13/21
170. "Designing new classes of electrically and optically addressable polymers" 3M Technical Forum (Virtual), 6/8/21
169. "Light-driven buckling, assembly, and motion of nanocomposite hydrogel sheets at air/water interfaces", Smart and Tough Gels IUTAM Symposium (Virtual), 5/26/21
168. "Driving deformation, assembly, and coupled motion of polymers with light", School of Polymer Science and Polymer Engineering, University of Akron (Virtual), 4/23/21
167. "Driving deformation, assembly, and coupled motion of polymers with light", Chemical and Biomolecular Engineering, University of Maryland (Virtual), 4/20/21
166. "Electro-mechanically responsive ionoelastomer heterojunctions", American Chemical Society Spring Meeting (Virtual), 4/5/21
165. "Driving deformation, assembly, and coupled motion of polymers with light", Soft Matter Research Center seminar, University of Colorado Boulder (Virtual), 3/31/21
164. "Bioinspired assembly and collective motion of nanocomposite hydrogel sheets at air/water interfaces", MRS Fall Meeting (Virtual), 12/3/20
163. "Light-induced actuation of hybrid crystalline/polymeric photomechanical materials", MRS Fall Meeting (Virtual), 12/2/20
162. "Driving deformation, motion, and assembly of polymers with light", Lebanon Valley College, Chemistry, 11/10/20
161. "Light-driven buckling, assembly, and motion of nanocomposite hydrogel sheets at air/water interfaces", IUTAM Symposium on Mechanics of Smart and Tough Gels, Austin, TX 5/2020 [Meeting cancelled due to COVID-19]
160. "Electro-adhesion of Ionoelastomer Junctions", Pressure Sensitive Tape Council Meeting, Orlando, FL 5/7/20 [Meeting cancelled due to COVID-19]

159. “Electro-mechanically responsive ionoelastomer heterojunctions”, American Chemical Society Spring Meeting, Philadelphia, PA 3/26/20 [Meeting cancelled due to COVID-19]
158. “Shaping and reshaping polymer sheets with light”, University of Florida Soft Matter Symposium, 10/08-10/2019
157. “Soft ionic diodes formed at the interface of ionoelastomers”, Telluride Science Research Center workshop on Molecular Engineering of Soft Matter, Telluride, CO 06/16/2019
156. “Soft ionic diodes formed at the interface of ionoelastomers”, Gordon Research Conference on Polymers, South Hadley, MA 06/11/2019
155. “Directing shape, assembly, and motion of responsive polymer sheets”, Drexel University, Materials Science and Engineering, 5/15/19
154. “Polymer-regulated growth of hybrid semiconductor nanostructures with applications as ‘electronic noses’”, American Chemical Society Spring Meeting, Orlando, FL, 4/2/19
153. “Driving reconfiguration, assembly, and motion of hydrogel sheets with light”, American Chemical Society Spring Meeting, Orlando, FL, 4/2/19
152. “Directing shape, assembly, and motion of responsive polymer sheets”, University of Colorado Boulder, Chemical Engineering, 3/8/19
151. “Soft ionic diodes formed at the interface of ionic liquid elastomers”, American Physical Society March Meeting, Boston, MA, 3/5/19
150. “Fabrication and assembly of shape-programmed polymer sheets”, Tufts University, Department of Physics, 2/8/19
149. “Fabrication and assembly of shape-programmed polymer sheets”, Rutgers University, Department of Chemistry, 1/29/19
148. “Formation of disordered co-continuous nanostructures in randomly end-linked copolymer networks”, Sukant Tripathy Memorial Symposium, UMass Lowell, 11/30/18
147. “Origomu: The geometry and mechanics of folding polymer plates and shells”, IMECE, Pittsburgh, PA 11/12/18
146. “Tuning domain connectivity in multi-component polymer materials”, University of Florida, Chemical Engineering, 11/5/18
145. “Shaping and reshaping polymer sheets with light” Edwards Symposium: New Horizons in Soft Matter, Cambridge, UK, 9/7/18
144. “Soft ionic and electronic conducting devices”, 4th International Workshop of Soft Machines and Mechanics, Xi’an, China, 6/15/18
143. “Formation of disordered co-continuous nanostructures by microphase separation of randomly end-linked copolymer networks ” PP’2018 Conference, Xi’an, China, 6/12/18
142. “Origomu: The geometry and mechanics of folding polymer plates and shells”, DYFP 2018, Kerkrade, Netherlands, 3/29/18 [Plenary “Snow” talk]
141. “Geometrically programmed buckling of polymer plates and shells”, CalTech, 3/1/18
140. “Tailoring structure, properties, and responsiveness of multicomponent polymer materials”, Arkema, King of Prussia, PA 1/25/18
139. “Geometrically programmed buckling of polymer plates and shells”, University of Illinois, 12/12/17
138. “Fabrication and (frustrated) assembly of shape programmed polymer sheets”, Princeton University Center for Theoretical Studies, 11/29/17
137. “Dynamic bio-inspired materials by buckling of polymer films and multilayers”, Harvard University, 11/7/17
136. “ Geometrically programmed buckling of polymer plates and shells”, University of Pittsburgh, 10/19/17

135. "Photothermally reprogrammable buckling of liquid crystal polymer films", ILCEC, Rice University, Houston, TX 10/16/17
134. "Driving shape changes and motion of responsive polymer nanocomposites", American Chemical Society Meeting, Washington, DC, 8/23/17
133. "Responsive polymer nanocomposites with optically reconfigurable 3D shapes", Optical Society of America Incubator on Photomechanical Materials, Washington, DC, 6/26/17
132. "Shaping and packing of continua by programming growth and bending", Aspen Center for Physics, 6/14/17
131. "Fabrication, reconfiguration, and assembly of shape-programmed polymer sheets", MRSEC Seminar, Brandeis University, 6/8/17
130. "Fabrication, reconfiguration, and assembly of shape-programmed polymer sheets", Chemical and Biomolecular Engineering, NYU, 5/5/17
129. "Shape morphing and motion of responsive hydrogel composites", American Physical Society March Meeting, New Orleans, LA, 3/13/17
128. "Tuning domain connectivity in multi-component polymer-based materials", PPSM Seminar, MIT, 12/14/16
127. "Crystallization driven assembly of conjugated organic nanostructures", Chemistry Department, Xi'an Jiaotong University, Xi'an, China, 11/2/16
126. "Folding gels and shells: Geometric design principles for reconfigurable materials", Civil and Environmental Engineering, UMass Amherst, 10/28/16
125. "Driving continuous shape reconfiguration and motion of polymer plates and shells", Keynote presentation, NEW.Mech workshop, Harvard University, 10/22/16
124. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Mechanical Engineering, Temple University, 9/16/16
123. "Dynamic bio-inspired materials by buckling of polymer films and multilayers" ACS Fall 2016 Meeting, Philadelphia, PA, 8/21/16
122. "Photothermally reprogrammable buckling of hydrogel and liquid crystal polymer films", International Conference on Liquid Crystals, Kent State University, 8/2/16
121. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", PMMH, ESPCI, Paris, 5/20/16
120. "Programmable buckling and assembly of responsive polymer films", SIMM, ESPCI, Paris, 5/19/16
119. "Buckling and folding of photo-patterned polymer films", IMTEK, University of Freiburg, Germany, 5/2/16
118. "Controlling structure in polymer nanocomposites and randomly crosslinked networks", Michelin Research Center, Clermont-Ferrand, France, 4/21/16
117. "Patterned buckling of hydrogel and liquid crystal polymer sheets" Workshop on Physics and Mechanics of Active Solids, ESPCI, Paris, 4/12/16
116. "Programming shape and structural color with polymer nanocomposites", Clarkson University, Chemistry & Biomolecular Science, 3/4/16
115. "Controlling solution crystallization of (and with) conjugated polymers", PACIFICHEM 2015, Polymer Interfaces: Design, Structure, Physical Properties and Applications, Honolulu, HI 12/17/15.
114. "Optically programmed buckling of polymer films and multilayers", PACIFICHEM 2015, Symposium on Mechanically Responsive Materials, Honolulu, HI 12/16/15.
113. "Photo-patterned deformation of responsive polymer networks", Pacific Polymer Conference, Polymer Physics and Processing: Networks and Gels, Kauai, HI 12/12/15.

112. "Geometrically-programmed deformation of polymer plates and shells", University of California, Santa Barbara, Chemical Engineering Department Seminar, 11/5/15.
111. "Crystallization-driven assembly of conjugated organic nanostructures", University of California, Santa Barbara, Materials Department Colloquium, 10/23/15.
110. "Crystallization-driven assembly of conjugated organic nanostructures", ACS Meeting, Boston, MA, 8/16/15
109. "Controlling solution crystallization of (and with) conjugated polymers", TSRC Workshop on Polymer Physics, Telluride, CO, 6/15
108. "Buckling of soft polymer surfaces: Creases, wrinkles, and beyond", Tianjin University, Department of Materials Science and Engineering, Tianjin, China, 6/4/15
107. "Defining reconfigurable 3D structures through buckling of polymer plates, shells, and multilayers", International Workshop on Pattern Formation in Soft Materials, Tianjin, China 6/2/15
106. "Defining reconfigurable 3D structures through buckling of polymer plates, shells, and multilayers", Xi'an Jiaotong University, 5/29/15
105. "Responsive and reconfigurable materials based on polymer nanocomposites", Dow Discussion Group on Interface Science, Dow Chemical, Midland, MI, 5/19/15
104. "Programming shape and structural color with photocrosslinkable polymer films", Center for Evolutionary Materials Symposium, UMass Amherst, 5/13/15
103. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Macromolecular Science and Engineering, Case Western Reserve University, 4/24/15
102. "Tuning dispersion of nanoparticles in polymer matrices", American Chemical Society, Division of Polymer Chemistry, 2015 Carl Marvel Creative Polymer Chemistry Award Symposium in honor of Todd Emrick, 3/24/15.
101. "Responsive photonic multilayers from photo-crosslinkable polymers and nanocomposites", American Chemical Society, Division of Polymer Chemistry, Symposium on Next Generation Smart Materials, 3/23/15.
100. "Optically programmed buckling of polymer nanocomposite gels", American Chemical Society, PMSE Division, Symposium on Stimulus-Responsive Assemblies and Materials, 3/22/15.
99. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Polymer Program, University of Connecticut, 2/13/14.
98. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Polymer Science, University of Akron, 2/6/14.
97. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Huazhong University of Science and Technology, Wuhan, China, 11/3/14.
96. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", Zhejiang University, Hangzhou, China, 10/30/14.
95. "Patterning, manipulating, and characterizing polymer gel sheets and multilayers with programmed 3D configurations using optical microscopes", New England Society of Microscopy Meeting, UMass Amherst, 10/2/14.
94. "Folding gels and shells: Designing reconfigurable 3D shapes and 'mechanical meta-materials'", NC State/Duke/UNC Triangle MRSEC Seminar Series, 9/25/14
93. "Swelling-driven shaping of responsive polymer sheets and multilayers", IUTAM Symposium on Soft Active Materials, Haifa, Israel, 5/14/14
92. "Tuning self-assembled structures in polymer blends, networks, and nanocomposites", Materials Science and Engineering, Rensselaer Polytechnic Institute, 4/30/14
91. "Tuning self-assembled structures in polymer heterojunctions and nanocomposites", Chemical Engineering, Princeton University, 4/19/14 (2014 Dudley A. Saville Lecture)

90. "Responsive materials by buckling of polymer sheets, surfaces, and multilayers", Chemistry, Southern Illinois University, 3/7/14
89. "Buckling instabilities of polymer multilayers", APS March Meeting, Denver, CO, 3/4/14 (Dillon Medal Award Lecture)
88. "Responsive materials by buckling of polymer sheets, surfaces, and multilayers", Chemical Engineering, The Ohio State University, 2/13/14
87. "Geometry and mechanics of responsive polymer sheets and multilayers", ESPCI/Ecole Polytechnique, Paris, France 1/28/14 (Invited 3 hr. tutorial lecture for graduate students)
86. "Responsive materials by buckling of polymer sheets and multilayers", Department of Chemistry, University of Toronto, 11/8/13
85. "Patterned sheets and multilayers of photo-crosslinkable polymers", American Institute of Chemical Engineers, San Francisco, CA, 11/5/13
84. "Harnessing Instabilities of oil/water interfaces to tailor structure and function of amphiphilic polymer assemblies", American Institute of Chemical Engineers, San Francisco, CA, 11/5/13
83. "Responsive Materials by Buckling of Soft Elastic Sheets", Engineering Science and Mechanics, Virginia Tech, 10/23/13
82. "Responsive Materials by Buckling of Soft Elastic Sheets", Physics Department, University of Pennsylvania, 10/2/13
81. "Responsive polymer sheets, multilayers, and nanocomposites", University of Colorado, Chemical and Biological Engineering, 9/17/13
80. "Photo-crosslinkable polymers for responsive gel sheets and multilayers", American Chemical Society Fall Meeting, Indianapolis, IN, 9/12/13
79. "Polymer networks for the design of soft active materials", American Chemical Society Fall Meeting, Indianapolis, IN 9/8/13 (Journal of Polymer Science Innovation Award Talk)
78. "Motion and aggregation of nanoparticles in polymer gels and composites", TSRC Workshop on Polymer Physics, Telluride, CO 6/16/13
77. "Organizing conjugated polymer heterostructures by solution crystallization", American Chemical Society Spring Meeting, New Orleans, LA 4/7/13
76. "Responsive Materials by Buckling of Soft Elastic Sheets", University of Minnesota, Chemical Engineering and Materials Science Seminar, 3/12/13.
75. "Photo-crosslinkable materials for responsive origami", Interdisciplinary Meeting on Adaptive Origami, Dayton, OH, 1/16/13
74. "Responsive Materials by Buckling of Soft Elastic Sheets", Materials Research Society Fall Meeting, Boston, MA 11/29/12
73. "Responsive Materials by Buckling of Soft Elastic Sheets", Massachusetts Institute of Technology, Mechanical Engineering micro/nano seminar, 11/7/12
72. "Kinetic pathways to organized polymer/nanoparticle assemblies", NIST/Industry Polymer Surface/Interface Consortium Meeting, 10/17/12
71. "Buckling Instabilities of Soft Polymer Sheets", Harvard Applied Mechanics Seminar, 9/12/12
70. "Patterned growth of photo-crosslinkable polymer sheets", Workshop: Modern Perspectives on Thin Sheets: Geometry, Elasticity, and Statistical Physics; Lorentz Center, Leiden, Netherlands, 9/5/12
69. "Crystallization-driven assembly of conjugated-polymer-based heterostructures", American Chemical Society Fall Meeting, Philadelphia, PA, 8/20/12
68. "Patterning growth with photo-crosslinkable copolymer films", Warwick 2012, Warwick, UK, 7/12/12
67. "Creasing instability of soft polymer surfaces", IUPAC World Polymer Congress, Blacksburg, VA, 6/25/12

66. "Controlling structure in heterogeneous polymer materials: Instabilities of soft gel layers and kinetic pathways to nanoscale assemblies", US Army Natick Soldier Research, Development and Engineering Center (NSRDEC), Natick, MA, 6/11/12
65. "Swelling-induced instabilities of constrained and patterned gel sheets", CooperVision, Pleasanton, CA, 4/11/12
64. "Creasing of soft polymer surfaces: Toward responsive nano-patterns", American Chemical Society Spring Meeting, San Diego, CA, 3/26/12
63. "Kinetic pathways to organized polymer/nanoparticle assemblies", American Chemical Society Spring Meeting, San Diego, CA, 3/26/12
62. "Photo-patterned growth of stimulus-responsive gel sheets", American Chemical Society Spring Meeting, San Diego, CA, 3/25/12
61. "Swelling-induced shaping of constrained and patterned hydrogel sheets", Materials Science & Engineering, University of California, Berkeley, 3/22/12
60. "Kinetic pathways to organized polymer/nanoparticle assemblies", American Physical Society March Meeting, Boston, MA, 3/1/12
59. "Swelling-induced shaping of constrained and patterned hydrogel sheets", Princeton University, PRISM/PCCM Seminar, 12/14/11
58. "Reversible folding of micro-patterned hydrogel sheets", Pacific Polymer Chemistry, Jeju Island, Korea, 11/15/11
57. "Rolling, Buckling, and Creasing of Constrained and Patterned Hydrogel Sheets", Materials Science and Engineering, Penn State University, 10/27/11
56. "Swelling of constrained and patterned hydrogel sheets: New approaches to active surfaces and polymer micro-devices", American Chemical Society Colloid and Surface Science Symposium, Montreal, CA, 6/21/11 (Unilever Award Plenary Lecture)
55. "Rolling, folding, and creasing of photo-patterned hydrogel sheets", MRSEC Spring Workshop, University of Massachusetts Amherst, 5/12/11
54. "Swelling of constrained and patterned hydrogel sheets: New approaches to active surfaces and polymer micro-devices", McMaster University, Brockhouse Institute for Materials Research, 4/11/11
53. "Swelling of constrained and patterned hydrogel sheets: New approaches to active surfaces and polymer micro-devices", Stanford University, Materials Science, 4/1/11
52. "Creasing instability of soft polymer materials under compression", American Chemical Society National Meeting, Anaheim, CA 3/29/11
51. "Crystallization-driven solution assembly and intraphase gelation: New pathways to functional nanomaterials", World Premier International Advanced Institute for Materials Research Annual Workshop, Tohoku University, Sendai, Japan, 2/23/11
50. "Controlling structure in heterogeneous polymer materials: Photo-patterned gels, phase selective aggregation, and co-crystallization", Gordon Research Conference: Macromolecular Materials, 1/13/11
49. "Swelling of constrained and micro-patterned hydrogel films", University of Massachusetts, Physics Department Condensed Matter Seminar, 11/18/10
48. "Swelling of constrained hydrogels: New approaches to active surfaces and micro-objects", University of Notre Dame, Chemical Engineering, 11/2/10
47. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nano-assemblies", Chemical Engineering, Yonsei University, 5/28/10
46. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nano-assemblies", Engineering, Ulsan National Institute for Science & Technology, 5/27/10

45. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nano-assemblies", Chemical Engineering, Pohang University of Science & Technology, 5/26/10
44. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nano-assemblies", Chemical Engineering, Korea Advanced Institute for Science & Technology, 5/25/10
43. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nano-assemblies", Chemical Engineering, Seoul National University, 5/24/10
42. "Swelling of constrained hydrogels: new approaches to active surfaces and micro-objects", North Carolina ACS Polymer Group, 4/8/10
41. "Swelling of constrained hydrogels: new approaches to active surfaces and micro-objects", Program in Polymer Science and Technology, Massachusetts Institute of Technology, 3/31/10
40. "Active gel surfaces: Using an elastic instability to create dynamic biomolecular patterns", American Chemical Society Meeting, San Francisco, CA 3/10
39. "Swelling of constrained hydrogels: New approaches to active polymer microstructures", Physics Department, Amherst College, 2/25/10
38. "Instabilities of polymers at interfaces: New routes to responsive and nanostructured materials", Materials Science and Engineering Colloquium, University of Illinois, Urbana Champaign, 1/25/10
37. "An elastic creasing instability of soft polymer surfaces", Applied Mechanics Colloquium, Harvard University, 12/9/09
36. "Instabilities of polymers at interfaces: New routes to responsive surfaces and nanostructured materials", Soft Matter Seminar, Yale University, 12/8/09
35. "An elastic creasing instability of soft polymer surfaces", Computation in Science Seminar, University of Chicago, 12/2/09
34. "Instabilities of polymers at interfaces: New routes to responsive and nano-structured materials", School of Polymer, Textile and Fiber Engineering, Georgia Tech, 10/12/09
33. "Swelling of constrained hydrogels: New approaches to active polymer microstructures", Department of Chemistry, Mt. Holyoke College, 10/8/09
32. "An elastic creasing instability of surface-attached polymer gels", Workshop on Strong Gels, Woods Hole, MA 8/14/09
31. "Creasing instability of solvent-swelled polymer films", American Physical Society Meeting, DPOLY, Pittsburgh, PA 3/09
30. "Assembling amphiphilic block copolymers through instabilities of liquid interfaces", American Chemical Society Meeting, PMSE, Salt Lake City, UT 3/22/09
29. "Formation of multi-vesicular polymer capsules through instabilities of liquid interfaces", American Chemical Society Meeting, Division of Colloid & Surface Chemistry, Salt Lake City, UT 3/23/09
28. "Instabilities of polymers at interfaces: New routes to complex and responsive (bio-) materials", Gordon Research Conference: Macromolecular Materials, Ventura, CA (1/15/09)
27. "Instabilities of polymers at interfaces: New routes to complex and responsive materials", Department of Chemistry, Rensselaer Polytechnic Institute (12/9/08)
26. "Instabilities of polymers at interfaces: New routes to complex and responsive materials", Department of Chemistry, University of Massachusetts, Lowell, MA (11/13/08)
25. "Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies", Polymer Program, University of Connecticut, Storrs, CT (10/17/08).
24. "Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies", Department of Physics, Condensed Matter Seminar, University of Massachusetts, Amherst, MA (10/09/08).

23. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, Department of Chemical and Biomedical Engineering, University of South Florida, Tampa, FL (10/03/08).
22. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD (9/18/08).
21. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, Department of Chemical Engineering, City College of New York (9/15/08).
20. “Creasing of surface-attached hydrogels: Harnessing an elastic instability to create active surfaces”, Division of Engineering and Applied Sciences, Harvard University, Cambridge, MA, (7/9/08).
19. “Instabilities of polymers at interfaces: New methods for creating complex and responsive materials”, Chemistry Department, Wellesley College (6/25/08).
18. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, Dept. of Inorganic, Structural and Physical Chemistry, Stockholm University, Sweden (6/16/08)
17. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, YKI—Institute for Surface Chemistry, Stockholm, Sweden (6/12/08)
16. “Instabilities of polymers at interfaces: Creasing of hydrogel surfaces and spontaneous generation of amphiphilic assemblies”, Dept. of Physics, Ecole Normale Superieure, Paris, France (6/11/08)
15. “Creasing of hydrogels under compression: Harnessing an elastic instability to create active surfaces”, ACS Spring Meeting, New Orleans, LA (4/7/08)
14. “Instabilities of polymers at interfaces: spontaneous generation of folded surfaces and amphiphilic polymer assemblies”, College of Nanoscale Science and Engineering, SUNY, Albany, NY (10/5/07)
13. “Instabilities of polymers at interfaces: responsive surface structures and nano-/micro-particle preparation”, Abbott Vascular, Santa Clara, CA (9/21/07)
12. “Instabilities of polymers at interfaces”, Procter & Gamble, Cincinnati, OH (8/30/07)
11. “Surfaces with responsive topography: creasing of soft materials under compression”, ACS Spring Meeting, Chicago, IL (3/25/07)
10. “Surface wrinkling of hydrogels”, International Center for Materials Research (ICMR) US-Taiwan symposium, Taipei (1/4/07)
9. “Polymer vesicles from double emulsions”, Drexel University, Chemical and Biological Engineering, Philadelphia, PA (12/8/06)
8. “Morphological instabilities of polymers at interfaces”, Eastman-Kodak, Rochester, NY (12/5/06)
7. “Mechanical instabilities in confined hydrogels: nano-scale materials synthesis and micro-scale surface patterning” UMass CUMIRP Spring lecture series, Amherst, MA (5/10/05)
6. “Templated thin films of nanostructured inorganic oxides” Squishy Physics seminar, Harvard University, Cambridge, MA (4/28/04)
5. “Templated thin films of nanostructured inorganic oxides” Rowland Institute at Harvard, Cambridge, MA (4/26/04)
4. “Templated thin films of nanostructured inorganic oxides” Northeastern University, Chemical Engineering, Boston, MA (4/15/04)
3. “Templated thin films of nanostructured inorganic oxides” University of Texas, Chemical Engineering, Austin, TX (3/30/04)
2. “Templated thin films of nanostructured inorganic oxides” UMass Chemical Engineering, Amherst, MA (3/11/04)

1. “Block copolymer thin films as templates for nanostructured silica and titania” UMass Polymer Science & Engineering, Amherst, MA (3/9/04)

Contributed Lectures:

16. “Disordered bicontinuous nanostructures from randomly end-linked copolymer networks”, APS 2017 March Meeting, New Orleans, LA 3/14/17
15. “Nanoporous materials from randomly end-linked copolymer networks”, ACS Fall 2016 Meeting, Philadelphia, PA 8/22/16
14. “Creasing of multilayer polymer films”, Symposium XX: Shape Programmable Materials, MRS Meeting, San Francisco, CA (4/23/14).
13. “Assembly of conjugated-polymer-based nanostructures driven by solution-state crystallization”, APS Meeting, Dallas, TX (3/22/11)
12. “Creasing instability of hydrogel surfaces: Nucleation, growth dynamics, and hysteresis”, APS Meeting, Portland, OR (3/18/10)
11. “Hydrogel surfaces with dynamic biomolecular patterns”, ACS Meeting, Salt Lake City, UT (3/25/09)
10. “Creasing instability of surface-attached hydrogels”, APS Meeting, New Orleans, LA (3/12/08).
9. “Creasing of soft surfaces under compression”, APS Meeting, Denver, CO (3/6/07).
8. “Polymer vesicles from double emulsions”, ACS Colloids and Surfaces, Boulder, CO (6/20/06).
7. “Dewetting instability during formation of polymersomes from block copolymer-stabilized double emulsions”, APS Meeting, Baltimore, MD (3/14/06).
6. “Templating with crosslinked block copolymer thin films”, MRS Meeting, Boston, MA (11/29/04).
5. “Block copolymer thin films as templates for nanostructured silica and titania”, APS Meeting, Montreal, CA (3/04).
4. “Thin films of bicontinuous cubic nanostructured silica”, AIChE Meeting, San Francisco, CA (11/03)
3. “Templated thin films of bicontinuous cubic nanostructured silica”, APS Meeting, Austin, TX (3/03)
2. “Control of nanoscale ordering in templated metal oxide thin films”, APS Meeting, Indianapolis, IN (3/02)
1. “Rational control of phase in thin films of nanostructured metal oxides templated by amphiphilic block copolymers”, MRS Meeting, Boston, MA (12/01)

Research Funding

(*Indicates projects where I am PI or co-PI)

Current:

Funding Agency and Project Title	Period Covered	Amount (Total costs)
National Science Foundation DMR Polymers* “Ionoelastomer heterojunctions on the micro- and nano-scale” (DMR- 2104892)	9/1/2021 - 8/31/2024	\$460,657
Office of Naval Research* (PI: G. Grason, UMass) “MURI: Photomechanical material systems—from molecules to devices” (N00014-18-1-2624)	6/2018 – 5/2023	\$720,000 (to CU)

Department of Energy, BES Materials Chemistry* “Self-assembly of cocontinuous nanostructured copolymer templates with compositional and architectural dispersity” (DE-SC0020982)	8/1/2020 – 1/31/2023	\$300,517
National Science Foundation* (PI: J. W. Medlin, CU) “EFRI E3P: Hydrogenolysis for upcycling of polyesters and mixed plastics” (EFMA-2132033)	9/1/2021 - 8/31/2025	\$2,000,000 (total)
Army Research Office* (co-PI: C. Santangelo, Syracuse) “Soft Mechanical Logic” (W911NF-21-1-0068)	2/2021 – 1/2023	\$349,213
National Science Foundation* (PI: J. Pikul, UPenn) “EFRI C3 SoRo: 3-D surface control for object manipulation with stretchable materials” (EFRI-1935294)	1/1/2020 – 12/31/2024	\$475,064 (to CU)
ACS Petroleum Research Fund* (co-PI: D. Schwartz, CU Boulder) “Monitoring dynamics during polymer crystallization by single molecule FRET” (62507-ND7)	09/01/2021 - 08/31/2023	\$110,000
National Science Foundation (PI: S. Fraden, Brandeis) “Bioinspired Soft Materials MRSEC” (DMR-2011846)	09/01/2020 – 08/31/2026	\$591,913
Office of Naval Research* DURIP (senior personnel/effective co-PI; PI: M. Toney, CU Boulder) “Small- and Wide-angle X-ray Scattering to Probe Functional Organic Materials” (ONR N00014-22-1-2361)	06/01/2022 - 05/30/2023	\$699,088
Department of Energy* (PI: Arthi Jayaraman, University of Delaware) “Understanding Structure, Phase Behavior, and Physical Properties of Polysulfamides and Polysulfamates using Simulations, Experiments, and Machine Learning” (DE-SC0023264)	08/15/2022 - 08/14/2025	\$1,014,866
Minnesota Mining and Manufacturing Company (3M Company)* (PI: T. White, CU) “Local Control of Adhesion Via Voxelated Liquid Crystalline Elastomers” (MRA 19-08-0180 TO07)	12/05/2022 - 12/05/2024	\$232,000

Past:

Funding Agency and Project Title	Period Covered	Total Costs
Office of Naval Research* DURIP “Micromechanical characterization of photomechanical materials” (N00014-21-1-2836)	8/17/2021 - 8/16/2022	\$197,333
Department of Energy, BES Materials Chemistry* (PI: A. Jayaraman, UDel) “Predictive Coarse-Grained Modeling of Morphologies in Polymer Nanocomposites with Specific Interactions” (DE-SC0017753)	8/1/2020 – 1/31/2022	\$28,062
NSF DMR Polymers*	11/1/2020 – 8/31/2021	\$106,058

“Shape Morphing Polymer Networks Based on Ion Gels” (DMR-2105825)		
Photopolymerizations IUCRC Seed Award*	03/01/2020 -- 12/31/2020	\$15,000 (direct)
At UMass Amherst		
Army Research Office* (co-PI: C. Santangelo, Syracuse) “Soft Mechanical Logic” (W911NF-19-1-0348; 3-year award; transferred to CU Boulder)	6/1/2019 – 5/31/2020	\$165,496
Office of Naval Research* (co-PIs: Bardeen, Bhattacharya, Martinez, Palfy-Muhoray, Read de Alaniz) “MURI: “Photomechanical material systems—from molecules to devices” (ONR N00014-18-1-2624)	6/2018 – 5/2023	\$490,000
Department of Energy, BES Materials Chemistry* “Self-assembly of cocontinuous nanostructured copolymer templates with compositional and architectural dispersity” (DE-SC0016208; 3-year award; transferred to CU Boulder)	08/01/2019 - 07/31/2020	\$149,483
National Science Foundation (PI: S. Fraden, Brandeis) “Bioinspired Soft Materials MRSEC”	11/01/2017--08/31/2 020	\$124,250
Department of Energy, BES Materials Chemistry* (PI: A. Jayaraman, UDel) “Predictive Coarse-Grained Modeling of Morphologies in Polymer Nanocomposites with Specific Interactions” (DE-SC0017753)	8/1/2017 – 7/31/2020	\$63,468
NSF DMR Polymers* “Shape Morphing Polymer Networks Based on Ion Gels” (DMR-1609972; 3-year award + 2-year special creativity extension, transferred to CU Boulder)	9/1/2016 – 8/31/2021	\$573,942
Department of Energy, BES Materials Chemistry* “Targeted design of co-continuous nanostructures in randomly end-linked copolymer networks”	8/1/2016 – 7/31/2019	\$450,000
National Institutes of Health* (co-PI: S. Peyton, UMass) “R21: Rapid micro-patterned stretching platform to study cell behaviors during atherosclerosis”	9/1/2016 – 6/30/2019	\$239,250
Army Research Office* “Chemo-mechanical polymer constructs for feedback, homeostasis, and oscillation”	4/15/2016 – 4/14/2019	\$395,000
Azimuth Corporation (AFRL Prime)* “Dynamic shaping and optical response of plasmonic nanocomposite liquid crystal elastomers”	9/20/2016 – 9/19/2018	\$100,000
Defense Threat Reduction Agency* “Switchable Surface Instabilities for Controlled Permeation and Sensing”	12/23/2014-12/22/20 18	\$589,949
NSF EFRI* (PI: Mark Kuzyk, Washington State)	08/01/2013-07/31/20 18	\$430,438
BASF Corporation* (co-PI: Todd Emrick) “Functional Polyamides for Gradient Interfaces”	1/1/2017 - 12/31/2017	\$132,900

NSF EFRI* (PI: Christian Santangelo) “ODISSEI: Mechanical Meta-Materials from Self-Folding Polymer Sheets”	08/01/2012 – 07/31/2017	\$519,000
NSF DMR Polymers* “Beyond wrinkles and creases”	09/01/2013-08/31/20 16	\$336,000
DOE Early Career Award* “Crystallization-driven hierarchical organization of conjugated polymer based nanostructures”	07/15/2011 – 07/14/2016	\$750,000
Army Research Office* “PECASE: Active Microstructured Polymer Systems”	02/22/2011 – 02/21/2016	\$1,000,000
CUMIRP Research Grants* “Cluster N: Nanostructured Materials”	2008 - 2016	\$105,000
BASF Corporation* “Anisotropic porous polymer materials”	12/16/2014 – 12/15/2015	\$90,000
Defense Threat Reduction Agency* “Polymer multilayer photonic films: A new platform for low-cost robust sensors”	10/15/2010 – 10/14/2015	\$500,000
CooperVision Seedling Award*	11/01/2013-12/31/20 14	\$100,000
NSF CAREER Award (DMR)* “CAREER: Creasing of surface-attached polymer gels”	04/2008 – 08/2013	\$475,000
NSF (CBET)* “Using instabilities of fluid interfaces to assemble amphiphilic block copolymers”	07/2009 – 07/2012	\$282,010
ACS Petroleum Research Fund* “Supramolecular assembly of polymers at interfaces”	09/2009 - 08/2011	\$100,000
Center for Excellence in Apoptosis Research Pilot Grant*	11/2009 – 10/2010	\$26,000
Army Research Office STIR Award* “STIR: Active polymer micro-constructs	09/2008 – 06/2009	\$50,000
Eastman-Kodak* Support of graduate student (Ian Henderson)	01/2007 – 12/2009	\$76,200
NSF Small Grant for Exploratory Research (CBET)* “Design of nano- and micro-particles by controlled micro-scale fluid flows”	09/2007 – 08/2008	\$50,000
University of Massachusetts Faculty Research Grant* “Surface wrinkling of hydrogel films”	06/2006 - 05/2007	\$30,000
DOE Energy Frontier Research Center (PI: Tom Russell) “ERG 2: Controlled assemblies and morphologies	08/2009 – 07/2014	\$250,000
NSF MRSEC on Polymers (PI-Tom Russell, Todd Emrick)	09/2008 – 08/2014	\$230,000
NSF MRSEC on Polymers (PI-Tom Russell)	05/2006 - 08/2008	\$59,000
NSF Chemical Bonding Center/Center for Chemical Innovation: Fueling the Future (PI: S. Thayumanavan)	09/2007 – 08/2010	\$120,000
MassCrest Army Green Energy Center (PIs: E. Bryan Coughlin, S. Thayumanavan)	09/2008 – 08/2011	\$70,000
3M Nontenured Faculty Award* “Responsive polymer surfaces”	2009 – 2011	\$45,000

Classroom Teaching Record

Course No.	Course Title	Credits	Enrollment	Team Taught?
2005-06 Academic Year				
<i>-Spring Term-</i>				
PSE 897J	Interfacial Polymer Assemblies	1	1	N
2006-07 Academic Year				
<i>-Fall Term-</i>				
PSE 608	Physical Chemistry of Polymers I	3	31	Y
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	24	Y
PSE 897J	Interfacial Polymer Assemblies	1	3	N
2007-08 Academic Year				
<i>-Fall Term-</i>				
PSE 608	Physical Chemistry of Polymers I	3	35	Y
PSE 897J	Interfacial Polymer Assemblies	1	2	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	27	Y
PSE 797KK	Wetting, Capillarity and Liquid Interfaces	1	11	N
PSE 897J	Interfacial Polymer Assemblies	1	4	N
2008-09 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	30	Y
PSE 897J	Interfacial Polymer Assemblies	1	5	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	25	Y
PSE 797NN	Introduction to Scientific Teaching	1	17	Y
PSE 897J	Interfacial Polymer Assemblies	1	7	N
2009-10 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	22	Y
PSE 897J	Interfacial Polymer Assemblies	1	7	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	16	Y
PSE 797PI	Polymer Interfaces and Thin Films	2	18	Y
PSE 897J	Interfacial Polymer Assemblies	1	8	N
2010-11 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	31	Y
PSE 797NN	Introduction to Scientific Teaching	1	14	Y
PSE 897J	Interfacial Polymer Assemblies	1	8	N

<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	28	Y
PSE 897J	Interfacial Polymer Assemblies	1	11	N
2011-12 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	19	Y
PSE 897J	Interfacial Polymer Assemblies	1	8	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	15	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
2012-13 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	26	Y
PSE 797NN	Introduction to Scientific Teaching	1	14	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	21	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
2013-14 Academic Year				
<i>-Fall Term-</i>				
PSE 797PI	Polymer Interfaces and Thin Films	2	14	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
<i>-Spring Term-</i>				
PSE 789	Physical Chemistry of Polymers II	3	23	Y
PSE 897J	Interfacial Polymer Assemblies	1	11	N
2014-15 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	16	Y
PSE 897J	Interfacial Polymer Assemblies	1	9	N
<i>-Spring Term-</i>				
PSE 501	Introduction to Polymer Science and Engineering	3	65	Y
PSE 897J	Interfacial Polymer Assemblies	1	11	N
2015-16 Academic Year				
<i>-Fall Term: On Sabbatical Leave-</i>				
<i>-Spring Term-</i>				
PSE 501	Introduction to Polymer Science and Engineering	3	81	Y
PSE 897J	Interfacial Polymer Assemblies	1	11	N
2016-17 Academic Year				
<i>-Fall Term-</i>				

PSE 602	Polymer Characterization Laboratory	3	20	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
<i>-Spring Term-</i>				
PSE 501	Introduction to Polymer Science and Engineering	3	51	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
2017-18 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	23	Y
PSE 897J	Interfacial Polymer Assemblies	1	9	N
<i>-Spring Term-</i>				
PSE 501	Introduction to Polymer Science and Engineering	3	76	Y
PSE 897J	Interfacial Polymer Assemblies	1	10	N
2018-19 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	15	Y
PSE 897J	Interfacial Polymer Assemblies	1	8	N
<i>-Spring Term-</i>				
PSE 501	Introduction to Polymer Science and Engineering	3	47	Y
PSE 897J	Interfacial Polymer Assemblies	1	9	N
2019-20 Academic Year				
<i>-Fall Term-</i>				
PSE 602	Polymer Characterization Laboratory	3	17	Y
PSE 897J	Interfacial Polymer Assemblies	1	7	N
<i>-Spring Term-</i>				
PSE 797TF	Polymer Thin Films and Interfaces	1	9	N
2020-21 Academic Year				
<i>-Fall Term: Teaching Release-</i>				
<i>-Spring Term-</i>				
CHEN 4460/5460	Polymer Engineering	3	26/21	N
2021-22 Academic Year				
<i>-Fall Term-</i>				
CHEN 5838	Polymer Thin Films and Interfaces	2	20	N
<i>-Spring Term: Teaching Release-</i>				
2022-23 Academic Year				
<i>-Fall Term-</i>				
CHEN 4460/5460	Polymer Engineering	3	13/19	N

- PSE797 KK: *Wetting, Capillarity and Liquid Interfaces* is a 1-credit course that I developed and taught in Spring 2008. Elements of the course related to surface energy and wetting of polymers were combined with new course material I developed on characterization and mechanics of thin films, and incorporated into PSE 797PI: *Polymer Interfaces and Thin Films* (co-taught with Al Crosby in Spring 2010 and Fall 2013).
- PSE 797NN: *Introduction to Scientific Teaching* is a course that I developed with Dr. Mathew Ouellett, Director of the UMass Center for Teaching, and taught in Spring 2009, Fall 2010, and Fall 2012.

Student Advising

Post-Doctoral Researchers (17):

Post-doctoral fellow	Department	Period
Dr. Jintao Zhu	Polymer Science	12/2006 - 06/2009
Dr. Jinhwan Yoon	Polymer Science	09/2008 – 02/2011
Dr. Eunji Lee	Polymer Science	02/2010 – 02/2011
Dr. Myunghwan Byun	Polymer Science	02/2011 – 08/2013
Dr. Bin Xu	Polymer Science	07/2011 – 05/2013
Dr. Laju Bu	Polymer Science	08/2011 – 7/2014
Dr. Kyuyoung Heo	Polymer Science	10/2011 – 10/2014
Dr. Junhee Na	Polymer Science	12/2012 – 5/2015
Dr. Weiguo Huang	Polymer Science	09/2014 – 09/2017
Dr. Seog-Jin Jeon	Polymer Science	10/2014 – 08/2017
Dr. Soonyong So	Polymer Science	8/2015 – 09/2016
Dr. Ji-Hwan Kang	Polymer Science	04/2017 – 07/2020
Dr. Hyeongjun Kim	Polymer Science	04/2017 – 05/2020
Dr. Wenwen Xu	Polymer Science/Chemical Engineering	12/2018 – 07/2022
Dr. Matthew McBride	Polymer Science/Chemical Engineering	09/2019 - 03/2022
Dr. Elayne Thomas	Polymer Science	01/2020 - 03/2022
Dr. Nabila Tanjeem	Polymer Science/Chemical Engineering	03/2020 – 07/2022

Graduate Students (36):

Student	Department	Thesis	Period
Genevieve L. Tucker	Polymer Science	MS	11/2005-12/2006
Jungwook Kim	Polymer Science	PhD	11/2006-05/2011

Le Li (co-advised: Russell)	Polymer Science	PhD	11/2006-11/2011
Ian Henderson	Polymer Science	PhD	11/2006-05/2012
Felicia Bokel	Polymer Science	PhD	11/2007-01/2013
Scott Christensen	Polymer Science	PhD	11/2007-04/2013
Dayong Chen	Polymer Science	PhD	09/2008-02/2014
Cheol Hee Lee (co-advised: Emrick, Crosby)	Polymer Science	PhD	11/2008-02/2014
Maria Chiappelli	Polymer Science	PhD	11/2009-12/2014
Jinhye Bae	Polymer Science	PhD	11/2009-12/2014
Kyle Bryson (co-advised: Russell)	Polymer Science	PhD	11/2010-12/2015
Anesia Auguste	Polymer Science	PhD	11/2010-3/2016
Rachel Letteri (co-advised: Emrick)	Polymer Science	PhD	11/2010-4/2016
Daniel Acevedo	Polymer Science	PhD	11/2011-05/2017
Nakul Bende	Polymer Science	PhD	11/2011-04/2017
Adam Hauser	Polymer Science	PhD	11/2012-03/2017
Ying Zhou	Polymer Science	PhD	11/2012-06/2018
Di Zeng	Polymer Science	PhD	11/2013-09/2018
Testu Ouchi	Polymer Science	PhD	11/2013-02/2019
Qi Lu	Polymer Science	PhD	11/2014-03/2020
Hyunki Kim (co-advised: Emrick)	Polymer Science	PhD	11/2014-05/2020
Alexa Kuenstler	Polymer Science	PhD	11/2015-08/2020
Carolyn Zhao	Polymer Science	MS	11/2015-04/2019
Minjung Lee	Polymer Science	PhD	11/2016-01/2022
David Limberg	Polymer Science	PhD	11/2016-03/2022
Jaechul Ju	Chemical Engineering	PhD	11/2017-Present
Hantao Zhou	Polymer Science	PhD	11/2018-Present
Montana Minnis	Chemical Engineering	PhD	11/2019-Present
Matthew Ticknor	Materials Science and Engineering	PhD	11/2019-Present
Owen Lee	Materials Science and Engineering	PhD	11/2019-Present
Alexander Osterbaan (co-advised: Bowman)	Chemical Engineering	PhD	11/2020-11/2022
Joe Roback	Chemical Engineering	PhD	11/2020-Present
Rishabh Tennankore	Materials Science and Engineering	PhD	11/2020-Present
Paula Pranda (co-advised: White)	Chemical Engineering	PhD	11/21-Present

Kate Crossett (co-advised: White)	Chemical Engineering	PhD	11/21-6/22
Samantha Eyolfson (co-advised: Schwartz)	Chemistry	PhD	11/22 - Present

Undergraduate Students (50):

Student	Department	University	Period
Emine Memis	Chemistry	Bilkent	06/2006-08/2006
Anesia Burns (PhD, UMass Amherst)	Materials	Florida	06/2007-08/2007
Farhana Momin (MS, Georgia Tech)	Chemistry/ Chem. Eng.	Mt. Holyoke /UMass	01/2008-06/2009
Antonio Castillo	Mechanical Eng.	Wisconsin, Green Bay	06/2008-08/2008
Nangelie Ferrer	Engineering Tech.	Springfield Tech. CC	06/2008-08/2008
Kathryn Arpino (PhD student, Johns Hopkins)	Chemical Physics	Hamilton College	06/2009-08/2009
Jesse Tzeng	Materials Science	Michigan	06/2009-08/2009
Anna Melker (Fulbright fellow, NSF GRFP Fellow, PhD, UCSB)	Chemistry	Bryn Mawr	06/2010-08/2010
Aimee Khan	Chemical Eng.	UMass	06/2010-08/2010
Alyssa McKenna (NSF GRFP Fellow, PhD, UMn)	Physics	Mt. Holyoke	06/2010-08/2010
Matthew Gurney	Chemical Eng.	UMass	02/2011-05/2013
Sarah-Beth Loder	Chemistry	College of Wooster	06/2011- 08/2011
Heather Leask	Chemical Eng.	UConn	06/2011-05/2013
Elena Stachew	Macromolecular Science & Eng.	Case Western	06/2011-08/2011
Danielle Grolman (PhD, UAkron)	Chemical Eng.	UMass	09/2011-05/2012
Evan Gennis	Chemical Eng.	UMass	09/2011-05/2012
Trenton Dawson	Chemistry	Texas A&M	06/2012-08/2012
Thao Do Vy Le (PhD student, Vanderbilt)	Interdisciplinary Science	Hampshire College	05/2012-05/2014
Emily Dubuc	Biomedical Engineering	W. New England	06/2012-08/2012
Min-Jae Byun	Chemical Eng.	UMass	09/2012-05/2013
Christopher Cueto	Chemistry	Juniata	06/2013-08/2013
Sarah Innes-Gold (PhD, UCSB)	Chemical Physics	Tufts	06/2013-08/2013
Elvira Trabanino	Chemical Eng./Env. Biol.	Cal Poly Pomona	06/2013-08/2013
Cyprian Gyamfi	Chemical Eng.	UMass	11/2013-05/2014
Luis Marin	Mechanical Eng.	UMass	11/2013-05/2014

Nivedita Sharma	Polymer Science	IIT Roorkee	05/2014-08/2014
Kevin Djatcha	Biochemistry	UMass	10/2014-5/2015
Jordan Kornfeld (MS, UWashington)	Physics	UMass	01/2015-12/2015
Aude Duhamel		ESPCI	5/2015-7/2015
Raymond Bartolucci	Chemical Engineering	Princeton	6/2015-8/2015
Autumn Phaneuf (MS, UMass)	Mathematics	Hoyoke CC	1/2016-12/2017
Jake Heinlein	Chemical Engineering	Brown	6/2016-8/2016
Phuong Bui (PhD student, Drexel)	Chemical Engineering	UMass	6/2016 – 5/2019
Igor Kheyfets	Chemical Engineering	UMass	4/2016 – 8/2016
Olivia Czubarow	Chemical Engineering	UMass	10/2016 – 5/2018
Timothy Braunsdorf	Chemical Engineering	UMass	4/2017 – 5/2018
Mayuri Porwal (PhD student, UMn)		ICT Mumbai	6/2017 – 8/2017
Lindsay Paquin	Chemical Engineering	UMass	9/2017 – 5/2019
Kevin Sanchez	Chemical Engineering	UMass	1/2018 – 5/2018
Yihan Gao	Physics	UMass	2/2018 – 05/2018
Enora LeRoux	Chemical Engineering	ENSCMu	5/2018 – 8/2018
Christina Hemmingsen	Chemistry	Case Western	6/2018 – 8/2018
Meghal Keskar	Chemical Engineering	UMass	9/2018 - 5/2019
Josh Okon	Chemical Engineering	UMass	2/2018 - 5/2019
Finn Mackin	Chemistry	Stonybrook	6/2019-8/2019
Cruz Montoya	Chemical Engineering	CU Boulder	9/2021 - present
Cindy Li	Chemical Engineering	CU Boulder	9/2021 - 5/2022
Dylan Simone	Chemical Engineering	CU Boulder	9/2021 - 5/2022
Luis Caspari-Thiele	Materials Science and Engineering	Purdue University	6/2022 - 8/2022
Joshua Sharpes	Chemical Engineering	CU Boulder	9/2022 - present

Visiting and post-baccalaureate students (8):

Student	Department	Position	Period
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Veronica Trujillo	Polymer Science	Post-bac	04/2006 – 04/2007
Kwanyeol Paek	Polymer Science	Visiting PhD student, KAIST	02/2011 – 11/2011
Hyeongjun Kim	Polymer Science	Visiting PhD student, KAIST	02/2014 – 03/2015
Satoru Matsushima	Polymer Science	Visiting PhD student, Nagoya University	08/2014 – 10/2014
Chih-Ying Liu	Chemical Engineering	Visiting PhD student, National Tsing Hua University	05/2017 – 04/2018
Ming-Hsiang Cheng	Applied Chemistry	National Chiao Tung University	04/2018 – 01/2019
Ji-Won Kim	Chemical and Biomolecular Engineering	Visiting PhD student, KAIST	06/2019 – 12/2019
Yong-Jae Kim	Chemical and Biomolecular Engineering	KAIST	10/2019 - 03/2020

Service on Other PhD Committees:

At CU Boulder

Chemical Engineering (10): Hayden Fowler, Brian Radka, Alina Martinez, Nicholas Bongiardina, Tayler Hebner, Grant Bauman, Jeremy Herman, Kristin Lewis, Nathanael Schwindt, Talaial Alina

Mechanical Engineering (1): Kristin Calahan

At UMass Amherst

Polymer Science and Engineering (37): John Harner, Derek Breid, Katrina Kratz, Wei Chen, Ji Xu, Shilpi Sanghi, Xinyu Wei, Samantha McRae, Chelsea Davis, Yuri Ebata, Jimmy Lawrence, Kathleen McEnnis, Liz Sterner, Sahas Rathi, Wei Zhao, Tsung-Han Tsai, Catherine Walker, Byoung-Jin Jeon, Isaac Bruss, Pirlil Ertem, Sami Fakhouri, WenXu Zhang, Xiabo Shen, Yinyong Li, Yu-Cheng Chen, Matt Skinner, Haomiao Yuan, Joel Sarapas, Michael Leaf, Soeun Kim, Marcus Cole, Kelly McLeod, Hyeyoung Kim, Ashlin Sathyan, Cristiam Santa, Doug Hall, Yongjin Kim

Chemistry (10): Sompit Wanwong, Michael Lartey, Amarnath Bheemaraju, Nagamani Chikkannagari, Jinhong Kim, Andrea Della Pelle, Jeffrey Lucas, Jing Guo, Morgan Baima, Kwang-Won Park

Physics (6): Jiangshui Huang, Xuan Ding, Jiansheng Feng, Nesrin Senbil, Carlos Duque, Sabin Adhikari

Chemical Engineering (5): Thuy Nyugen, Tyler Martin (CU Boulder), Hyeongjun Kim (KAIST), Wesley Viola, Li-Wei Chang

Food Science (2): Bicheng Wu, Yanqi Qu

Civil and Environmental Engineering (1): Panos Pantidis

Service Contributions

To the External Professional Community:

Reviews of Publications and Proposals:

Proposals

Ad hoc, panel, and site visit reviewer, National Science Foundation.

Ad hoc reviewer, US Army Research Office

Ad hoc reviewer, Department of Energy

Ad hoc reviewer, ACS Petroleum Research Fund

Ad hoc reviewer, Stanford Synchrotron Radiation Lightsource

Ad hoc reviewer, French National Research Agency (ANR)

Ad hoc reviewer, US Army Corps of Engineers, ERDC

Journals (Listed approximately in descending order of frequency)

Macromolecules, Soft Matter, ACS Applied Materials and Interfaces, Advanced Materials, Advanced Functional Materials, Science Advances, Journal of the American Chemical Society, Langmuir, Chemistry of Materials, Physical Review Letters, Nature Materials, Angewandte Chemie International Edition, Proceedings of the National Academy of Sciences, Materials Horizons, Journal of Polymer Science (A&B), Nature Communications, Biomacromolecules, Journal of Materials Chemistry, Journal of Chemical Physics, Science, ACS Macro Letters, Physical Chemistry and Chemical Physics, Journal of Colloid and Interface Science, Materials Research Bulletin

External Educational and Professional Activities:

1. Membership Committee, American Chemical Society, Division of Polymer Chemistry, 2007 – 2009.
2. Session Chair, “Hybrid Organic/Inorganic Nanomaterials: Synthesis, Assembly, and Applications II”, Division of Polymer Chemistry/Division of Polymeric Materials: Science and Engineering, American Chemical Society Meeting, Chicago, IL, 3/07.
3. Session Chair, “Responsive Surfaces, Interfaces and Films”, Division of Polymer Physics, American Physical Society, March Meeting, Denver, CO, 3/07.
4. Session Chair for “Block Copolymers in Solution and Blends”, Division of Polymer Physics, American Physical Society March Meeting, New Orleans, LA 3/08
5. Invited Speaker, Northeast Section of the American Chemical Society 15th Annual Undergraduate Day, Boston, MA, 11/1/08
6. Session Organizer and (Co-)Chair, “Stimuli Responsive Polymers” and “Colloidal Assembly and Fabrication”, American Institute of Chemical Engineers, Fall Meeting, Philadelphia, PA, 11/08
7. Poster session judge, Materials Science and Engineering Division, American Institute of Chemical Engineers Fall Meeting, Philadelphia, PA 11/08.
8. Publicity Committee, American Physical Society, Division of Polymer Physics, 2009 – 2013.
9. Discussion leader, “Advanced Polymer Nanoscience and Technology”, Gordon Research Conference: Macromolecular Materials, Ventura, CA 1/14/09

10. Invited Focus Session Organizer and Chair, “Responsive Gels at Surfaces and in the Bulk”; Session Chair, “Elastomers and Gels II” Division of Polymer Physics, American Physical Society March Meeting, Pittsburgh, PA 3/09
11. Symposium Co-organizer, “Active and Responsive Surfaces”, Division of Polymer Chemistry, American Chemical Society Spring Meeting, Salt Lake City, UT, 4/09
12. Discussion leader, “Wetting”, Gordon Research Conference: Science of Adhesion, New London, NH, 7/09.
13. Initial stage judge for Siemens Competition in Math, Science, and Technology, 10/09
14. Co-organizer of Invited Focus Session “Kinetic pathways to assembly of polymers, particles and biomolecules” and Focus Session “Kinetic control of solution assemblies”, Division of Polymer Physics, American Physical Society March Meeting, Dallas, TX 3/11
15. Invited participant, US-China Workshop on Nanomaterials for Energy, Environment and Healthcare, San Francisco, CA 4/28-29/11
16. Invited participant, Discussion Co-leader for section on “Structure and Assembly Processes”, DOE workshop on “Current Challenges and Emerging Areas in Soft Matter”, Oak Ridge, TN, 7/21-22/11
17. Poster session judge, New England Workshop on the Mechanics of Materials and Structures, Cambridge, MA 10/1/11
18. Invited participant, “Important Areas for Future Biomaterials Investments”, National Science Foundation, Arlington, VA 6/19-20/12.
19. PMSE Member at Large, ACS PMSE Division; 1/13 – 12/18.
20. ACS Macro Letters, Associate Editor 7/13 – present.
21. Co-organizer, Symposium on “Nanoparticle-based hybrid materials in photo-induced processes and solar cells”, Fall 2013 ACS Meeting, Indianapolis, IN 9/13.
22. Member, APS DPOLY Programming Committee 3/14 – 3/18
23. Co-organizer, “Symposium XX: Shape Morphing Materials”, Spring 2014 MRS Meeting, San Francisco, CA, 4/14.
24. Co-organizer, New England Workshop on the Mechanics of Materials and Structures, Amherst, MA, 10/18/14
25. International Advisory Board: "Stimuli Responsive and Multifunctional Polymers: Progress in Materials and Applications", CIMTEC 2016, Perugia, Italy.
26. Symposium co-organizer, “Recent Developments in Nanomaterials”, 2016 ACS Colloids and Surface Science Symposium, Harvard University, Cambridge, MA, 6/5-7/16
27. Invited participant “Frontiers in Polymer Science and Engineering”, National Science Foundation Workshop, Arlington, VA 8/17-18/16.
28. DPOLY Program Co-chair and poster session organizer, 2017 APS March Meeting, New Orleans, LA
29. DPOLY Program Chair, 2018 APS March Meeting, Los Angeles, CA
30. Member of Editorial Board, *Mechanics of Soft Materials* (2018 – present)
31. Member of International Advisory Board, CIMTEC 2020 (postponed until 2022) Symposium on Stimuli responsive and Multifunctional Polymers : Progress in Materials and Applications

32. Member of Editorial Advisory Board, *Journal of Polymer Science* (2019 - present)
33. Member of Executive Editorial Board, *Giant* (2020 - present)
34. APS DPOLY Vice President (2021 - 2022)
35. Member of Editorial Advisory Board, *ACS Polymers Au* (2021 - present)
36. Member of External Advisory Board, University of Chicago MRSEC (2021 - present)

To the College and University - at UMass Amherst:

1. Materials Research Science and Engineering Center (MRSEC): Associate Director for Education and Diversity (2009 – 2014), faculty participant (2006-2014), annual symposium co-organizer (2007). The Center coordinated collaborative polymer research efforts on campus under a multi-investigator NSF grant. Our group conducts research on instabilities of polymer interfaces and assembly of polymer/nanoparticle hybrid materials. In May, 2007 I co-organized the Center’s annual symposium on “Active Surfaces”. From 2009-2014 I oversaw the education, outreach, and diversity efforts of the Center, a role which continued through the PSE department from 2014 - 2019..
2. Center for UMass-Industry Research on Polymers (CUMIRP): Co-Leader of Cluster N (2010-2019), faculty participant (2006-2019), Poster Session organizer (2006-2007). This center coordinates interactions and research agreements between the University and industrial partners. I participated in the on-campus reviews held twice annually, and organized the fall poster session in 2006 and 2007. From 2010-2019, I served as Co-Leader of Cluster N, focused on Nanotechnology.
3. Northeast Alliance for Graduate Education and the Professoriate and UMass STEM Diversity Institute: participant (2006 – 2017), Diversity Team member (2007-2008). UMass was the central campus for an NSF-sponsored alliance focused on increasing involvement of under-represented minorities in the sciences. I participated in panels and gave tours during on-campus recruiting events, and traveled to off-campus events each year, including the HBCU-undergraduate research conference, the New York Louis Stokes Alliance for Minority Participation, and meetings at Northeast Alliance partner schools including University of Puerto Rico Mayaguez and Bennett College.
4. Energy Frontier Research Center (EFRC): faculty participant (2009-2015), Member of Facility Director Search Committee (2009-2010). The EFRC was a DOE-funded center focused on polymer-based materials for harvesting solar energy. I served on a search committee that resulted in the hiring of Dr. Volodymyr Duzhko to direct the EFRC facilities.
5. Invited Panelist, Workshop on New Faculty Funding, UMass Office of Research Development, 12/2/11
6. Invited Panelist, Workshop on NSF Graduate Research Fellowships, UMass Graduate School 9/20/12.
7. Advisory Board, Center for the Integration of Research, Teaching, and Learning (CIRTL) at UMass, 9/2013- present.
8. Advisory Board, UMass Graduate School Office of Professional Development, 9/2013 – present.
9. Faculty presenter, Graduate Women in STEM “Situation Room” meeting 10/30/13.
10. Member, Chemical Engineering Faculty Search Committee, 2016-2017
11. Member, Search Committee for X-ray Scattering Facility Director, 2018

12. Member, NSM & CNS Scholarship Committee (2006-2010)
13. Member, CNS Research Review Council (2017 – 2018)
14. Departmental representative to College Personnel Committee (2017 – 2019)

At CU Boulder

1. Member, COSINC Equipment Committee (2021 - present)
2. Member, JSCBB Basement Renovation Working/Planning Committee (2021 - present)
3. Faculty mentor, STEM Routes Uplift Program (2021 - present)
4. Discussion leader on “Soft Matter” at MRSEC@CU Kickoff and Ideation Workshop, 8/20/21

To the Polymer Science & Engineering Department - UMass Amherst:

1. Website/Publicity Committee Member (2006-2019), Chair (2013-2019)
2. Seminar Coordinator (2007-2008, 2014-2016). I coordinated the weekly seminar schedule for the Polymer Science & Engineering Department. Speakers included prominent nationally and internationally recognized scientists in the field of polymers and soft materials science.
3. Member, Graduate Curriculum Committee (2006-2019). This committee is responsible for overseeing the graduate curriculum, and increasing the number and quality of applicants to, and accepted students in, Polymer Science & Engineering.
4. Member, Finance Committee (2008-2010, 2013-2019).
5. Member, Department Head Search Committee (2009-2010)
6. Member, Department Head Review Committee (2016)
7. Member, Faculty Search Committee (2016-2017)

To the Chemical & Biological Engineering Department - University of Colorado Boulder:

1. Diversity, Equity, and Inclusion Committee Member (2020 - present)
2. Faculty Committee Member (2020 - present)
3. Faculty Search Committee Member (2020-2021)
4. Faculty Associate Chair (2021 - present)
5. Faculty Search Committee Chair (2021-2022)
6. Participant in panel on graduate fellowship opportunities, 9/16/21