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## PROFESSIONAL EXPERIENCE

<b>Associate Professor, Mechanical Engineering</b>	<b>2019 – Now</b>
<b>Assistant Professor, Mechanical Engineering</b>	<b>2014 – 2019</b>
Boston University, Boston, MA	
<b>Assistant Professor, Engineering Science &amp; Mechanics</b>	<b>2011 – 2014</b>
Virginia Tech, Blacksburg, VA	
<b>Postdoctoral Research Associate</b>	<b>2009 – 2011</b>
Princeton University, Princeton, NJ	Advisor – <i>Howard A. Stone</i>

## EDUCATION

<b>Ph.D. in Polymer Science &amp; Engineering</b>	Advisor – <i>Alfred J. Crosby</i>	<b>2009</b>
<b>M.S. in Polymer Science &amp; Engineering</b>		<b>2005</b>
University of Massachusetts, Amherst, MA		
<b>B.S. in Chemistry</b>		<b>2004</b>
University of New Hampshire, Durham, NH		

## SELECTED AWARDS &amp; HONORS

NSF CAREER Award – CMMI: Mechanics of Materials	<b>2015</b>
ASEE Ferdinand P. Beer and E. Russell Johnston, Jr. Outstanding New Mechanics Educator	<b>2013</b>

## VISITING PROFESSORSHIPS

University of Grenoble, Alpes, FR – <i>Professor</i>	<b>2018</b>
4U Summer School “Complex Motion in Fluids”, Copenhagen – <i>Lecturer</i>	<b>2015</b>
École Supérieure de Physique et de Chimie Industrielles (ESPCI), FR – <i>Professor</i>	<b>2015</b>
Aalto University, School of Science, FI – <i>Professor</i>	<b>2015</b>
Sapienza Università di Roma, IT – <i>Lecturer</i>	<b>2015</b>
University Pierre and Marie Curie, FR – <i>Professor</i>	<b>2013</b>
Oxford University – OCCAM, UK – <i>Scholar</i>	<b>2011, 2013</b>

## PUBLICATIONS

1. Y. Yang, K. Vella, and **D.P. Holmes**, “Delicate and Precise Grasping using Kirigami,” *Under Review*, (2019).
2. D.J. Schunter Jr., R.K. Czech, and **D.P. Holmes**, “Packing Transitions in the Elastogranular Confinement of a Slender Loop,” *Under Review*, (2019).
3. **D.P. Holmes**, J-H. Lee, H.S. Park, M. Pezzulla, “The nonlinear buckling behavior of a complete spherical shell under uniform external pressure and homogenous natural curvature,” *In Revisions*, (2019). (also: *arXiv:1810.04078*)
4. A.R. Mojdehi, **D.P. Holmes**, C.B. Williams, T.E. Long, D.A. Dillard, “The Effect of Normal Force and Rate on Kinetic Coefficient of Friction of Elastomeric Materials,” *In Revisions*, (2019).
5. D.J. Schunter Jr., M. Boucher, and **D.P. Holmes**, “Elastogranularity in Binary Granular Mixtures,” *Accepted: Granular Matter*, (2019).
6. **D.P. Holmes** and Y. Yang, “A Cut Above: Folding and Cutting Advanced Materials,” *Matter*, **1**, 788–800, (2019).
7. D.J. Schunter Jr., M. Boucher, and **D.P. Holmes**, “Elastogranularity in Binary Granular Mixtures,” *Accepted: Granular Matter*, (2019).
8. **D.P. Holmes** and Y. Yang, “A Cut Above: Folding and Cutting Advanced Materials,” *Matter*, **1**, 788–800, (2019).
9. A. Lee, D. Yan, M. Pezzulla, **D.P. Holmes**, and P.M. Reis, “Evolution of critical buckling conditions in imperfect bilayer shells through residual swelling,” *Soft Matter*, **15**, 6134–6144, (2019).
10. M. Curatolo, P. Nardinocchi, L. Teresi, and **D.P. Holmes**, “Swelling Effects on Localized Adhesion of an Elastic Ribbon,” *Proceedings of the Royal Society A*, **475**, 20190067, (2019).
11. **D.P. Holmes**, “Elasticity and Stability of Shape Changing Structures,” *Current Opinion in Colloid and Interface Science*, **40**:118–137, (2019). (also: *arXiv:1809.04620*)
12. L. Stein-Montalvo, P. Costa, M. Pezzulla, and **D.P. Holmes**, “Buckling of Geometrically Confined Shells,” *Soft Matter*, **15**(6), 1215–1222, (2019). (also: *arXiv:1810.04729*) (**Special Issue: Emerging Investigators – Front Cover**)
13. Y. Yang, M.A. Dias, and **D.P. Holmes**, “Architected Materials with Tunable Properties using Multistable Kirigami,” *Physical Review Materials*, **2**, 110601(R), (2018). (also: *arXiv:1807.06498*)

14. X. Jiang, M. Pezzulla, H. Shao, T.K. Ghosh, T.K. Ghosh, and **D.P. Holmes**, “Snapping of Bistable, Prestressed Cylindrical Shells,” *EPL (Europhysics Letters)*, **122**, 6,(2018).
15. S. Wei, H. Shao, X. Jiang, **D.P. Holmes**, and T.K. Ghosh, “Bioinspired Electrically Activated Soft Bistable Actuators,” *Advanced Functional Materials*, 1802999, (2018).
16. M. Taffetani, X. Jiang, **D.P. Holmes**, and D. Vella, “Static Bistability of Spherical Caps,” *Proceedings of the Royal Society A*, **474**, 0910, (2018).
17. D.J. Schunter Jr., M. Brandenbourger, S. Perriseau, and **D.P. Holmes**, “Elastogranular Mechanics: Buckling, Jamming, and Structure Formation,” *Physical Review Letters*, **120**, 078002, (2018). (**Front Cover**)
18. M. Pezzulla, N. Stoop, M.P. Steranka, A.J. Bade, and **D.P. Holmes**, “Curvature-Induced Instabilities of Shells,” *Physical Review Letters*, **120**, 048002, (2018). (also: *arXiv:1706.03888*)
19. M.A. Dias, M.P. McCarron, D. Rayneau-Kirkhope, P.Z. Hanakata, D.K. Campbell, H.S. Park, and **D.P. Holmes**, “Kirigami Actuators,” *Soft Matter*, **13**, 9087–9092, (2017). (also: *arXiv:1707.05477*) (**Back Cover**)
20. A.R. Mojdehi, **D.P. Holmes**, and D.A. Dillard, “Revisiting the Generalized Scaling Law for Adhesion: Role of Compliance and Extension to Progressive Failure,” *Soft Matter*, **13**, 7529–7536, (2017).
21. B. Tavakol, G. Froehlicher, **D.P. Holmes**, and H.A. Stone. “Extended Lubrication Theory: Estimation of Fluid Flow in Channels with Variable Geometry,” *Proceedings of the Royal Society A*, **473**(0234), (2017). (also: *arXiv:1403.2343*)
22. A.R. Mojdehi, **D.P. Holmes**, and D.A. Dillard, “Friction of Extensible Strips: An Extended Shear Lag Model with Experimental Evaluation,” *International Journal of Solids and Structures*, **124**, 125–134, (2017).
23. M. Pezzulla, N. Stoop, X. Jiang, and **D.P. Holmes**, “Curvature-Driven Morphing of Non-Euclidean Shells,” *Proceedings of the Royal Society A*, **473**(2201), (2017). (also: *arXiv:1611.06563*)
24. A.R. Mojdehi, B. Tavakol, W. Royston, D.A. Dillard, and **D.P. Holmes**, “Buckling of elastic beams embedded in granular media,” *Extreme Mechanics Letters*, **9**, 237–244, (2016).
25. **D.P. Holmes**, P.-T. Brun, A. Pandey, and S. Protière, “Rising Beyond Elastocapillarity,” *Soft Matter*, **12**, 4886, (2016). (**Front Cover**)
26. M. Pezzulla, G.P. Smith, P. Nardinocchi, and **D.P. Holmes**, “Geometry and Mechanics of Thin Growing Bilayers,” *Soft Matter*, **12**, 4435, (2016). (also: *arXiv:1509.05259*)
27. B. Tavakol and **D.P. Holmes**, “Voltage-Induced Buckling of Dielectric Films using Fluid Electrodes,” *Applied Physics Letters*, **108**, 112901, (2016). (also: *arXiv:1601.02866*)
28. M. Pezzulla, S.A. Shillig, P. Nardinocchi, and **D.P. Holmes**, “Morphing of Geometric Composites via Residual Swelling,” *Soft Matter*, **11**, 5812–5820, (2015). (also: *arXiv:1504.03010*) (**Inside Front Cover**)
29. R.H. Plaut, A.D. Borum, **D.P. Holmes**, and D.A. Dillard, “Falling vertical chain of oscillators, including collisions, damping, and pretensioning,” *Journal of Sound and Vibration*, **349**, 195–205, (2015).
30. **D.P. Holmes**, A. Borum, B. F. Moore III, D. A. Dillard, R. H. Plaut, “Equilibria and Instabilities of a Slinky: Discrete Model,” *International Journal of Non-Linear Mechanics*, **65**, 236–244, (2014). (also: *arXiv:1403.6809*)
31. B. Tavakol, M. Bozlar, G. Froehlicher, H.A. Stone, I.A. Aksay, and **D.P. Holmes**, “Buckling Instability of Dielectric Elastomeric Plates for Flexible Microfluidic Pumps,” *Soft Matter*, **10**(27), 4789–4794, (2014).
32. A. Pandey, D. Moulton, D. Vella, and **D.P. Holmes**. “Dynamics of snapping beams and jumping poppers” *EPL (Europhysics Letters)*, **105**, 24001, (2014). (also: *arXiv:1310.3703*)
33. **D.P. Holmes**, B. Tavakol, G. Froehlicher, and H.A. Stone. “Control and Manipulation of Microfluidic Flow via Elastic Deformations,” *Soft Matter*, **9**, 7049, (2013). (**Special Issue: Emerging Investigators**)
34. A. Pandey and **D.P. Holmes**. “Swelling-Induced Deformations: A Materials-Defined Transition from Structural Instability to Surface Instability,” *Soft Matter*, **9**, 5524, (2013).
35. M. Staykova, **D.P. Holmes**, C. Read, and H.A. Stone. “Mechanics of Surface Area Regulation of Cell Membranes,” *Proceedings of the National Academy of Sciences*, **108**, 22, 9084, (2011).
36. **D.P. Holmes**, M. Roché, T. Sinha, and H.A. Stone. “Bending and Twisting of Soft Materials by Non-Homogenous Swelling,” *Soft Matter*, **7**, 5188, (2011).
37. **D.P. Holmes**, A.J. Crosby. “Draping Films: A Wrinkle to Fold Transition,” *Physical Review Letters*, **105**, 038303, (2010).
38. **D.P. Holmes**, M. Ursiny and A.J. Crosby. “Crumpled Surface Structures,” *Soft Matter*, **4**, 82-85 (2008).
39. **D.P. Holmes** and A.J. Crosby. “Snapping Surfaces,” *Advanced Materials*, **19**, 21, 3589-3593, (2007).

## BOOKS & BOOK CHAPTERS

1. **D.P. Holmes**, “Growing and Morphing Shapes,” *Active Matter*. Ed. Skylar Tibbits. Boston: MIT Press, (2017).

## PATENTS

1. **D.P. Holmes**, Y. Yang, P. Zink. *Novel Elastic Gripper and Uses Thereof*, Provisional Patent Application No. 62/850,715, (2019).
2. A.J. Crosby, **D.P. Holmes**, K. Kalaitzdou, E.P. Chan, C.J. Rand. *Stimuli-Responsive Surfaces and Related Methods of Use*, Patent No. 8906283, (2014).

## INVITED SEMINARS

1. *Upcoming*: MIT, MMEC (Mechanics: Modeling, Experimentation, Computation), *Functional Kirigami Mechanical Metamaterials for Actuators, Muscles, and Grippers*, (2020).
2. *Upcoming*: Gordon Research Conference, Colloidal, Macromolecular, and Polyelectrolyte Solutions, *Shape-Shifting Structures*, (2020).
3. SES Conference, Mechanical Metamaterials Symposium, *Functional Kirigami Mechanical Metamaterials for Actuators, Muscles, and Grippers*, (2019).
4. Brandeis University, MRSEC Seminar Series, *Functional Kirigami Mechanical Metamaterials for Actuators, Muscles, and Grippers*, (2019).
5. University of Massachusetts, Amherst, Civil Engineering, *Elastogranular Mechanics in Fragile Matter*, (2019).
6. MIT, Design of Soft Green Materials Workshop, *Shape-Shifting Slender Structures*, (2018).
7. Northeastern University, Department of Mechanical Engineering, *Shaping Slender Structures*, (2018).
8. Harvard University, Widely Applied Mathematics (WAM) Seminar Series, *Shaping Slender Structures*, (2018).
9. APS March Meeting, Focus Session: *Soft Interface Mechanics*, Invited: *Soft Adhesion & Friction: Compliance, Hysteresis, and Swelling*, (2018).
10. University of Massachusetts, Amherst, Mechanical Engineering, *Swelling and Shaping of Soft Structures*, (2017).
11. University of Connecticut, Department of Mechanical Engineering, *Swelling and Shaping of Soft Structures*, (2017).
12. WORKSHOP: *Form and Deformation in Solid and Fluid Mechanics*, Isaac Newton Institute, Cambridge, UK, *Swelling and Shaping of Soft Structures*, (2017).
13. Boston Museum of Science, Research Presentation, *Break It 'Til You Make It: Engineering Shapes & Patterns*, (2017).
14. Laboratoire Interdisciplinaire de Physique, Université Grenoble Alpes, *Swelling and Shaping of Soft Structures*, (2017).
15. Purdue University, School of Material Engineering, *Elastogranular Mechanics in Fragile Matter*, (2017).
16. Clark University, Department of Physics, *Swelling and Shaping of Soft Structures*, (2017).
17. WPI, Department of Mechanical Engineering, *Swelling and Shaping of Soft Structures*, (2017).
18. US Army – NSRDEC, Natick, MA, Sigma Xi Seminar Series, *Swelling and Shaping of Soft Structures*, (2016).
19. Harvard University, “Squishy Physics” Seminar Series, *Swelling and Shaping of Soft Structures*, (2016).
20. WORKSHOP: *Geometry and Materials Sciences (GEMS)*, Okinawa Institute of Science and Technology (OIST), Okinawa, Japan, *Swelling and Growth of Thin Structures*, (2016).
21. WORKSHOP: *Geometry, Elasticity, Fluctuations, and Order in 2D Soft Matter*, Kavli Institute for Theoretical Physics, Santa Barbara, CA, *Swelling and Growth of Thin Structures*, (2016).
22. University of Virginia, Department of Mechanical Engineering, *Swelling and Growth of Thin Structures*, (2016).
23. University of Illinois, Urbana–Champaign, Aerospace Engineering, *Swelling and Growth of Thin Structures*, (2015).
24. Northeastern University, Physics, *Toy Mechanics: Popping Poppers & Slinking Slinkys*, (2015).
25. Clemson University, Chemical & Biomolecular Engineering, *Swelling and Growth of Thin Structures*, (2015).
26. MIT, Physical Mathematics Seminar, *Morphing of Slender Structures by Swelling*, (2015).
27. ACS PSE50 Symposium – American Chemical Society Fall Meeting, *Swelling-Induced Curling of Elastic Fibers Wet by Elastocapillary Rise*, (2015).
28. École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI – ParisTech), Laboratoire PMMH, *Swelling and Growth of Thin Structures*, (2015).
29. Institute of the Foundation for Fundamental Research on Matter (AMOLF) – Amsterdam, The Netherlands, Designer Matter Workshop, *Morphable Structures by Coupling Swelling and Geometry*, 2015.
30. Aalto University Science Institute, Espoo, FI, *Morphing of Slender Structures by Swelling*, (2015).
31. University of California, Santa Barbara, Mechanical Engineering, *Morphing of Slender Structures by Swelling*, (2015).
32. National Institute for Standards and Technologies (NIST), *Morphing of Slender Structures by Swelling*, (2015).
33. Purdue University, Center for Materials Processing and Tribology, *Morphing of Slender Structures by Swelling*, (2015).
34. Harvard University, SEAS Applied Mechanics Colloquia, *Morphing of Slender Structures by Swelling*, (2014).
35. Boston University, Mechanical Engineering, *Buckling and Snapping Structures for Advanced Functionality*, (2014).

36. Boston University, Mechanical Engineering, *Morphing of Slender Structures by Swelling*, (2013).
37. Brown University, Applied Mathematics, *Morphing of Slender Structures by Swelling*, (2013).
38. James Madison University, Physics and Astronomy, *Toy Mechanics: Popping Poppers and Slinking Slinkys*, (2013).
39. University Pierre and Marie Curie, *Toy Mechanics: Popping Poppers and Slinking Slinkys*, (2013).
40. APS March Meeting, Focus Session: *Soft Matter, Biology, & Bioinspiration*, Invited: *Swelling Structures*, (2013).
41. New England Complex Fluids Workshop, Yale University - New Haven, CT, *Using Thin Films of Rubber to Move Thin Films of Fluid*, (2013).
42. Princeton University, CWI Seminar, *Mechanics and Dynamics of Snapping Structures*, (2013).
43. California Institute of Technology, GALCIT Seminar - Pasadena, CA, *Swelling Structures: Bending, Twisting, and Snapping to Functionality*, (2012).
44. Oxford University, OCCAM Seminar, *Control and Manipulation of Fluid Flow using Elastic Deformations*, (2012).
45. Oxford University, OCCAM Seminar, *Dancing Discs: Bending and Twisting of Soft Materials by Non-Homogenous Swelling*, (2011).
46. Virginia Tech, Engineering Science & Mechanics, *Mechanics of Soft Materials*, (2011).
47. Princeton University, Mechanical and Aerospace Engineering, *Crumpling, Folding, and Snapping Films*, (2009).
48. Padden Award Symposium, APS March Meeting, Pittsburgh, PA, *Responsive Polymer Surfaces: Crumpling, Folding, and Snapping Films*, (2009).
49. Peebles Award Talk, Adhesion Society, Savannah, GA, *Responsive Polymer Surfaces*, (2009).