Douglas P. Holmes — Curriculum Vitae

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Education & Professional Experience

Assistant Professor, Mechanical Engineering — **2014 – Present**
Boston University, Boston, MA

Assistant Professor, Engineering Science & Mechanics — **2011 – 2014**
Virginia Tech, Blacksburg, VA

Postdoctoral Research Associate — **2009 – 2011**
Princeton University, Princeton, NJ
Advisor – *Howard A. Stone*

Ph.D. in Polymer Science & Engineering — **2009**
University of Massachusetts, Amherst, MA
Advisor – *Alfred J. Crosby*

M.S. in Polymer Science & Engineering — **2005**
University of Massachusetts, Amherst, MA

B.S. in Chemistry — **2004**
University of New Hampshire, Durham, NH
Advisor – *Donald C. Sundberg*

Awards & Honors

NSF CAREER Award – CMMI: Mechanics of Materials — **2015**
ASEE Ferdinand P. Beer and E. Russell Johnston, Jr. Outstanding New Mechanics Educator — **2013**
Best Poster Prize at the *WE-Heraeus Seminar*, Bad Honnef, DE — **2010**
APS Padden Award Finalist — **2009**
Adhesion Society Peebles Award — **2009**
Distinguished Best Paper at the Adhesion Society — **2008**
UNH College of Engineering & Physical Sciences *Douglas R. Woodward Award* — **2004**
UNH College of Engineering & Physical Sciences *Wilfred F. Langelier Award* — **2004**
Summer Undergraduate Research Fellowship for Polymer Research at the University of Sydney, AU — **2003**
UNH Chemistry *Vernon Lerch Award* — **2001**

Visiting Positions

4U Summer School "Complex Motion in Fluids", Copenhagen – *Lecturer* — **2015**
École Supèrieure de Physique et de Chimie Industrielles (ESPCI) – *Professor* — **2015**
Aalto University, School of Science – *Professor* — **2015**
Sapienza Università di Roma – *Lecturer* — **2015**
University Pierre and Marie Curie – *Professor* — **2013**
Oxford University – OCCAM – *Scholar* — **2013**
Oxford University – OCCAM– *Scholar* — **2011**

Invited Workshops

Okinawa Institute of Science and Technology (OIST), Okinawa, Japan — **2016**
– *Geometry and Materials Sciences (GEMS) Workshop*
Kavli Institute for Theoretical Physics, Santa Barbara, CA — **2016**
– *Geometry, Elasticity, Fluctuations, and Order in 2D Soft Matter*
National Academy of Engineering – Frontiers of Engineering Education, Irvine, CA — **2015**
Organizer: New England Workshop on Mechanics (NEW.Mech) – Boston University, Boston, MA — **2015**
Designer Matter Workshop – AMOLF, The Netherlands — **2015**
Oxford University Collaborative Workshop Initiative (CWI) — **2011–2014**
Pan-American Congress of Applied Mechanics (PACAM) – NSF Travel Scholarship — **2013**
Dynamics in Soft Condensed Matter: Dynasoft 2010 – ICAM Scientist Travel Award, Corsica, FR — **2010**
Mechanics of Soft Materials: Short Course – NSF Travel Fellowship — **2010**

Publications & Patents

1. M. Pezzulla, N. Stoop, X. Jiang, and **D.P. Holmes**, "Curvature-Driven Morphing of Non-Euclidean Shells," *Under Review*, (2016). (also: *arXiv:1611.06563*)
2. A.R. Mojdehi, B. Tavakol, W. Royston, D.A. Dillard, and **D.P. Holmes**, "Buckling of an elastica partially embedded in a granular medium," *Extreme Mechanics Letters*, **9**, 237–244, (2016).
3. **D.P. Holmes**, P.–T. Brun, A. Pandey, and S. Protière, "Rising Beyond Elastocapillarity," *Soft Matter*, **12**, 4886, (2016). (**Front Cover**)
4. 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*)
5. 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)
6. 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**)
7. 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).
8. **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*)
9. 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).
10. 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*)
11. 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).
12. **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**)
13. A. Pandey and **D.P. Holmes**. "Swelling-Induced Deformations: A Materials-Defined Transition from Structural Instability to Surface Instability," *Soft Matter*, **9**, 5524, (2013).
14. 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).
15. **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).
16. **D.P. Holmes** and A.J. Crosby. "Draping Films: A Wrinkle to Fold Transition," *Physical Review Letters*, **105**, 038303, (2010).
17. **D.P. Holmes**, M. Ursiny and A.J. Crosby. "Crumpled Surface Structures," *Soft Matter*, **4**, 82-85 (2008).
18. **D.P. Holmes** and A.J. Crosby. "Snapping Surfaces," *Advanced Materials*, **19**, *21*, 3589-3593, (2007).

Invited Seminars

1. *Upcoming:* Purdue University, School of Material Engineering, (2017).
2. *Upcoming:* Worcester Polytechnic Institute, Department of Mechanical Engineering, (2017).
3. US Army – NSRDEC, Natick, MA, Sigma Xi Seminar Series, (2016).
4. Harvard University, "Squishy Physics" Seminar Series, *Swelling and Shaping of Soft Structures*, (2016).
5. Geometry and Materials Sciences (GEMS) Workshop, Okinawa Institute of Science and Technology (OIST), Okinawa, Japan, *Swelling and Growth of Thin Structures*, (2016).
6. Kavli Institute for Theoretical Physics, Santa Barbara, CA, *Swelling and Growth of Thin Structures*, (2016).
7. University of Virginia, Department of Mechanical Engineering, *Swelling and Growth of Thin Structures*, (2016).
8. University of Illinois, Urbana–Champaign, Department of Aerospace Engineering, *Swelling and Growth of Thin Structures*, (2015).

9. Northeastern University, Physics, *Toy Mechanics: Popping Poppers & Slinking Slinkys*, (2015).
10. Clemson University, Department of Chemical and Biomolecular Engineering, *Swelling and Growth of Thin Structures*, (2015).
11. Massachusetts Institute of Technology, Physical Mathematics Seminar, *Morphing of Slender Structures by Swelling*, (2015).
12. ACS PSE50 Symposium – American Chemical Society Fall Meeting, *Swelling-Induced Curling of Elastic Fibers Wet by Elastocapillary Rise*, (2015).
13. École Supérieure de Physique et de Chimie Industrielles de la Ville de Paris (ESPCI – ParisTech), Laboratoire PMMH, *Swelling and Growth of Thin Structures*, (2015).
14. Institute of the Foundation for Fundamental Research on Matter (AMOLF) – Amsterdam, The Netherlands, Designer Matter Workshop, *Morphable Structures by Coupling Swelling and Geometry*, 2015.
15. Aalto University Science Institute, Espoo, FI, *Morphing of Slender Structures by Swelling*, (2015).
16. University of California, Santa Barbara, Mechanical Engineering, *Morphing of Slender Structures by Swelling*, (2015).
17. National Institute for Standards and Technologies (NIST), *Morphing of Slender Structures by Swelling*, (2015).
18. Purdue University, Center for Materials Processing and Tribology, *Morphing of Slender Structures by Swelling*, (2015).
19. Harvard University, SEAS Applied Mechanics Colloquia, *Morphing of Slender Structures by Swelling*, (2014).
20. Boston University, Mechanical Engineering, *Buckling and Snapping Structures for Advanced Functionality*, (2014).
21. Boston University, Mechanical Engineering, *Morphing of Slender Structures by Swelling*, (2013).
22. Brown University, Applied Mathematics, *Morphing of Slender Structures by Swelling*, (2013).
23. James Madison University, Physics and Astronomy, *Toy Mechanics: Popping Poppers and Slinking Slinkys*, (2013).
24. University Pierre and Marie Curie, *Toy Mechanics: Popping Poppers and Slinking Slinkys*, (2013).
25. APS March Meeting, Focus Session: *Soft Matter, Biology, & Bioinspiration* - Baltimore, MD, *Swelling Structures*, (2013).
26. New England Complex Fluids Workshop, Yale University - New Haven, CT, *Using Thin Films of Rubber to Move Thin Films of Fluid*, (2013).
27. Princeton University, CWI Seminar, *Mechanics and Dynamics of Snapping Structures*, (2013).
28. California Institute of Technology, GALCIT Seminar - Pasadena, CA, *Swelling Structures: Bending, Twisting, and Snapping to Functionality*, (2012).
29. Oxford University, OCCAM Seminar, *Control and Manipulation of Fluid Flow using Elastic Deformations*, (2012).
30. Oxford University, OCCAM Seminar, *Dancing Discs: Bending and Twisting of Soft Materials by Non-Homogenous Swelling*, (2011).
31. Virginia Tech, Engineering Science & Mechanics, *Mechanics of Soft Materials: Elasticity, Dynamics, and Geometry*, (2011).
32. Princeton University, Mechanical and Aerospace Engineering, *Crumpling, Folding, and Snapping Films*, (2009).
33. Padden Award Symposium, APS March Meeting, Pittsburgh, PA, *Responsive Polymer Surfaces: Crumpling, Folding, and Snapping Films*, (2009).
34. Peebles Award Talk, Adhesion Society, Savannah, GA, *Responsive Polymer Surfaces*, (2009).