22 April 2025

VITA

Thomas R. Powers

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Positions Held

2012–	Professor of Engineering and Professor of Physics, Brown University
2011–2012	Associate Professor of Engineering and Associate Professor of Physics, Brown University
2009–2011	Associate Professor of Engineering, School of Engineering, Brown University
2006–2008	James R. Rice Associate Professor of Solid Mechanics and Associate Professor of Engineering, Division of Engineering, Brown University
2000–2006	James R. Rice Assistant Professor of Solid Mechanics and Assistant Professor of Engineering, Division of Engineering, Brown University
1998–2000	Postdoctoral Fellow, Division of Engineering and Applied Sciences, Harvard University (supervisor: Prof. H. Stone)
1996–1998	Postdoctoral Research Associate, Dept. of Physics, University of Arizona (supervisor: Prof. R. Goldstein)
1995–1996	Postdoctoral Research Associate, Dept. of Physics, Princeton University (supervisor: Prof. R. Goldstein)

Visiting Positions and Consulting

2020–	Associate Editor for Fluid, Geometric, and Solid Mechanics, *Reviews of Modern Physics*
2009–2014	Associate Editor for Biological Physics, *Reviews of Modern Physics*
Jan 2020–May 2020	Visiting Research Scientist, Department of Physics, Brandeis University
May 2014–Dec 2014	Visiting Research Scholar, Department of Physics, Brandeis University
Spring 2011	Visiting Associate Professor, Department of Civil and Environmental Engineering, Massachusetts Institute of Technology
Fall 2006	Visiting Scholar, Department of Mechanical Engineering, Massachusetts Institute of Technology
Spring 1997	Visiting Assistant Professor, Department of Physics and Astronomy, Dartmouth College
1995–1996	Consultant, NEC Research Institute, Princeton NJ

Education

1995	Ph.D., University of Pennsylvania (Physics) Thesis: "Fluctuating Bilayer Membranes" Thesis advisor: Professor P. Nelson
1989	S.B., Massachusetts Institute of Technology (Physics)
1989	S.B., Massachusetts Institute of Technology (Mathematics)

Awards and Honors

Fellow, American Physical Society (Division of Fluid Dynamics)
James R. Rice Term Chair, Brown University, 2000–2008
CAREER Award, National Science Foundation, 2001–2006
2001 T. Francis Ogilvie Young Investigator Lectureship, Ocean Engineering, MIT

Research Interests

Soft matter: Membranes, polymers, gels, colloids, and liquid crystals. Active matter.
Biological physics: Motility. Biological materials.
Mechanics: Low-Reynolds number hydrodynamics. Elasticity of rods, plates, and shells. Fluid-structure interactions.

Peer-reviewed Publications and Submissions

1. J. H. Dickie, T. Weng, Y.-C. Chen, Y. He, S. Saxena, R. A. Pelcovits, T. R. Powers, and K.-T. Wu, "Confinement geometry governs the impact of external shear stress on active stress-driven flows in microtubule-kinesin active fluids," submitted 2025.
2. R. Adkins, J. Robaszewski, S. Shin, F. Brauns, L. Jia, A. Khanra, P. Sharma, R. Pelcovits, T. R. Powers, Z. Dogic, "Topology and kinetic pathways of colloidosome assembly and disassembly," submitted 2024.
3. A. Trevino, T. R. Powers, R. Zenit, and M. Rodriguez, Jr., "Low Reynolds number pumping near an elastic half space," accepted, Phys. Rev. Fluids (2025).
4. T. J. Picou, H. Luo, R.J. Polackwich, B. B. Gabilondo, R. G. McAllister, D. A. Gagnon, T. R. Powers, H. G. Elmendorf, and J. S. Urbach, "A novel mechanism of microbial attachment: the flagellar pump of *Giardia lamblia*," PNAS Nexus **3** (2024) pgae545.
5. A. G. Prabhune, A. S. Garcia-Gordillo, I. S. Aranson, T. R. Powers, and N. Figueroa-Morales, "Bacteria navigate anisotropic media using a flagellar tug-of-oars," PRX Life **2** (2024) 033004.
6. W. Luo, A. Baskaran, R. A. Pelcovits, and T. R. Powers, "Flow states of two dimensional active gels driven by external shear," Soft Matter **20** (2024) 738. Inside front cover article.
7. L. Ding, R. A. Pelcovits, and T. R. Powers, "Chiral fluid membranes with orientational order and multiple edges," Soft Matter **19** (2023) 8453.
8. A. Khanra, L. L. Jia, N. P. Mitchell, A. Balchunas, R. A. Pelcovits, T. R. Powers, Z. Dogic, and P. Sharma, "Controlling the shape and topology of two-component colloidal membranes," Proc. Natl. Acad. Sci. (USA) **119** (2022) e2204453119.
9. A. H. Kumar, S. J. Thomson, T. R. Powers, and D. M. Harris, "Taylor dispersion of elongated rods," Phys. Rev. Fluids **6** (2021) 094501. Editor's Selection.
10. L. L. Jia, S. Pei, R. A. Pelcovits, and T. R. Powers, "Axisymmetric membranes with edges under external force: buckling, minimal surfaces, and tethers," Soft Matter **17** (2021) 7268. Cover article.
11. L. Ding, R. A. Pelcovits, and T. R. Powers, "Deformation and orientational order of chiral membranes with free edges," Soft Matter **17** (2021) 6580.
12. C. Alas, T. R. Powers, and T. Kuriabova, "Swimming of microorganisms in quasi-two-dimensional membranes," J. Fluid Mech. **911** (2021) 35.
13. L. Ding, R. A. Pelcovits, and T. R. Powers, "Shapes of fluid membranes with chiral edges," Phys. Rev. E **102** (2020) 032608.

14. A. Balchunas, L. L. Jia, M. Zakhary, J. Robaszewski, T. Gibaud, Z. Dogic, R. A. Pelcovits, and T. R. Powers, "Force-induced formation of twisted chiral ribbons," Phys. Rev. Lett. **125** (2020) 018002.

15. G. Duclos, R. Adkins, D. Banerjee, M. S. E. Peterson, M. Varghese, I. Kolvin, A. Baskaran, R. A. Pelcovits, T. R. Powers, A. Baskaran, F. Toschi, M. F. Hagan, S. J. Streichan, V. Vitelli, D. A. Beller, and Z. Dogic, "Topological structure and dynamics of three dimensional active nematics," Science **367** (2020) 1120. Cover article.

16. M. S. Krieger, S. E. Spagnolie, and T. R. Powers, "Swimming with small and large amplitude waves in a confined liquid crystal," J. Non-Newtonian Fluid Mech. **273** (2019) 104185.

17. H. Soni, W. Luo, R. A. Pelcovits, and T. R. Powers, "Stability of the interface of an isotropic active fluid," Soft Matter **15** (2019) 6318.

18. H. Soni, R. A. Pelcovits, and T. R. Powers, "Enhancement of microorganism swimming speed in active matter," Phys. Rev. Lett. **121** (2018) 178002.

19. J. Shi and T. R. Powers, "Swimming in an anisotropic fluid: How speed depends on angle," Phys. Rev. Fluids **2** (2017) 123102.

20. L. L. Jia, M. J. Zakhary, Z. Dogic, R. A. Pelcovits, and T. R. Powers, "Chiral edge fluctuations of colloidal membranes," Phys. Rev E **95** (2017) 060701(R).

21. T. Gibaud, C. N. Kaplan, P. Sharma, M. J. Zakhary, A. Ward, R. Oldenbourg, R. B. Meyer, R. D. Kamien, T. R. Powers, and Z. Dogic, "Achiral symmetry breaking and positive Gaussian modulus lead to scalloped colloidal membranes," Proc. Natl. Acad. Sci., USA **114** (2017) E3376.

22. Z. Qi, K. Ferguson, Y. Sechrest, T. Munsat, C. S. Park, M. A. Glaser, J. E. Maclennan, N. A. Clark, T. Kuriabova, and T. R. Powers, "Active microrheology of smectic membranes," Phys. Rev. E **95** (2017) 022702.

23. T. Kuriabova, T. R. Powers, Z. Qi, A. Goldfain, C. S. Park, M. A. Glaser, J. E. Maclennan, and N. A. Clark, "Hydrodynamic interactions in freely suspended liquid crystal films," Phys. Rev. E **94** (2016) 052701.

24. H. Soni, R. A. Pelcovits, and T. R. Powers, "Wrinkling of a thin film on a nematic liquid crystal elastomer," Phys. Rev. E **94** (2016) 012701.

25. M. S. Krieger, S. E. Spagnolie, and T. R. Powers, "Microscale locomotion in a nematic liquid crystal," Soft Matter **11** (2015) 9115.

26. M. S. Krieger, M. A. Dias, and T. R. Powers, "Minimal model for transient swimming in a liquid crystal," Eur. Phys. J. E **38** (2015) 94.

27. M. S. Krieger, S. E. Spagnolie, and T. R. Powers, "Locomotion and transport in a hexatic liquid crystal," Phys. Rev. E **90** (2014) 052503.

28. Z. Qi, Z. H. Nguyen, C. S. Park, M. A. Glaser, J. E. Maclennan, N. A. Clark, T. Kuriabova, and T. R. Powers, "Mutual diffusion of inclusions in freely suspended smectic liquid crystal films," Phys. Rev. Lett. **113** (2014) 128304.

29. B. Liu, M. Gulino, M. Morse, J. X. Tang, T. R. Powers, and K. S. Breuer, "Helical motion of the cell body enhances *Caulobacter crescentus* motility," Proc. Natl. Acad. Sci. (USA) **111** (2014) 11252.

30. I. Jung, T. R. Powers, J. M. Valles, Jr., "Evidence for two extremes of ciliary motor response in a single swimming microorganism," Biophys. J. **106** (2014) 106.

31. B. Liu, K. S. Breuer, and T. R. Powers, "Propulsion by a helical flagellum in a capillary tube," Phys. Fluids **26** (2014) 011701.

32. M. A. Dias and T. R. Powers, "Swimming near deformable membranes at low Reynolds number," Phys. Fluids **25** (2013) 101901.

33. S. E. Spagnolie, B. Liu, and T. R. Powers, "Locomotion of helical bodies in viscoelastic fluids: enhanced swimming at large helical amplitude," Phys. Rev. Lett. **111** (2013) 068101.

34. B. Liu, K. S. Breuer, and T. R. Powers, "Helical swimming in Stokes flow using a novel boundary-element method," Phys. Fluids **25** (2013) 061902.

35. M. Dasgupta, B. Liu, H. C. Fu, M. Berhanu, K. S. Breuer, T. R. Powers, A. Kudrolli, "Speed of a swimming sheet in Newtonian and viscoelastic fluids," Phys. Rev. E **87** (2013) 013015.

36. Y. Hyon, Marcos, T. R. Powers, R. Stocker, and H. C. Fu, "The wiggling trajectories of bacteria," J. Fluid Mech. **705** (2012) 58.

37. Marcos, H.C. Fu, T. R. Powers, and R. Stocker, "Bacterial rheotaxis," Proc. Natl. Acad. Sci. (USA) **109** (2012) 4780.

38. B. Liu, T. R. Powers, and K. S. Breuer, "Force-free swimming of a model helical flagellum in viscoelastic fluids," Proc. Natl. Acad. Sci. (USA) **108** (2011) 19516.

39. A. A. Demidenko, J. Lee, T. R. Powers, and M. L. Nibert, "Effects of viscogens on RNA transcription inside reovirus particles," J. Biol. Chem. **286** (2011) 29521.

40. H. C. Fu, V. B. Shenoy, and T. R. Powers, "Low-Reynolds-number swimming in gels," EPL **91** (2010) 24002.

41. T. R. Powers, "Dynamics of filaments and membranes in a viscous fluid," Rev. Mod. Phys. **82** (2010) 1607.

42. B. Qian, H. Jiang, D. A. Gagnon, K. S. Breuer, and T. R. Powers, "Minimal model for synchronization induced by hydrodynamic interactions," Phys. Rev. E **80** (2009) 061919.

43. E. Lauga and T. R. Powers, "The hydrodynamics of swimming microorganisms," Rep. Prog. Phys. **72** (2009) 096601. Selected by the Editorial Board of the journal as a highlight of 2009 (`iopscience.iop.org/0034-4885/page/Highlights of 2009`).

44. Marcos, H. C. Fu, T. R. Powers, R. Stocker, "Separation of microscale chiral objects by flow," Phys. Rev. Lett. **102** (2009) 158103.

45. H. C. Fu, C. W. Wolgemuth, and T. R. Powers, "Swimming speeds of filaments in nonlinearly viscoelastic fluids," Phys. Fluids **21** (2009) 033102.

46. H. C. Fu, V. B. Shenoy, and T. R. Powers, "Role of slip between a probe particle and a gel in microrheology," Phys. Rev. E **78** (2008) 061503.

47. H. C. Fu, C. W. Wolgemuth, and T. R. Powers, "Beating patterns of filaments in viscoelastic fluids," Phys. Rev. E **78** (2008) 041913.

48. H. Jiang and T. R. Powers, "Curvature-driven lipid sorting in a membrane tubule," Phys. Rev. Lett. **101** (2008) 018103.

49. B. Qian, T. R. Powers, and K. S. Breuer, "Shape transition and propulsive force of an elastic rod rotating in a viscous fluid," Phys. Rev. Lett. **100** (2008) 078101 (selected as "editor's suggestion").

50. H. C. Fu, T. R. Powers, and C. W. Wolgemuth, "Theory of swimming filaments in viscoelastic media," Phys. Rev. Lett. **99** (2007) 258101.

51. H. Jiang, G. Huber, R. A. Pelcovits, and T. R. Powers, "Vesicle shape, molecular tilt, and the suppression of necks," Phys. Rev. E **76** (2007) 031908.

52. M. B. Short, C. A. Solari, S. Ganguly, T. R. Powers, J. O. Kessler, and R. E. Goldstein, "Flows driven by flagella of multicellular organisms enhance long-range molecular transport," Proc. Natl. Acad. Sci. (USA) **103** (2006) 8315.

53. E. Alipour-Assiabi, G. Li, T. R. Powers, and J. X. Tang, "Fluctuation analysis of *Caulobacter crescentus* adhesion," Biophys. J. **90** (2006) 2206.

54. S. V. Srigiriraju and T. R. Powers, "Model for polymorphic transitions in bacterial flagella," Phys. Rev. E **73** (2006) 011902. Featured in Internet Journal Club for Condensed Matter Physics, September 2005; `condmatjournalclub.org`.

55. S. V. Srigiriraju and T. R. Powers, "Continuum model for bacterial flagellar polymorphism," Phys. Rev. Lett. **94** (2005) 248101. Featured in Internet Journal Club for Condensed Matter Physics, September 2005; `condmatjournalclub.org`.

56. M. J. Kim and T. R. Powers, "Deformation of a helical filament by flow and electric or magnetic fields," Phys. Rev. E **71** (2005) 021914.

57. R. E. Goldstein, P. Nelson, and T. R. Powers, "Teaching biological physics," Physics Today, March 2005.

58. M. J. Kim, M. J. Kim, J. Park, T. R. Powers, and K. S. Breuer, "Particle image velocimetry experiments on a macro-scale model for bacterial flagellar bundling," Experiments in Fluids, **37** (2004) 782.

59. M. J. Kim and T. R. Powers, "Hydrodynamic interactions between rotating helices," Phys. Rev. E **69** (2004) 061910.

60. C. W. Wolgemuth, R. E. Goldstein, and T. R. Powers, "Dynamic supercoiling bifurcations of growing elastic filaments," Physica D **190** (2004) 266.

61. M. J. Kim, J. C. Bird, A. J. Van Parys, K. S. Breuer, and T. R. Powers, "A macroscopic scale model of bacterial flagellar bundling," Proc. Natl. Acad. Sci. USA **100** (2003) 15481.

62. T. R. Powers, G. Huber, and R. E. Goldstein, "Fluid-membrane tethers: Minimal surfaces and elastic boundary layers," Phys. Rev. E. **65** (2002) 041901.

63. T. R. Powers, "The role of body rotation in bacterial flagellar bundling," Phys. Rev. E **65** (2002) 040903(R).

64. S. A. Koehler and T. R. Powers, "Twirling elastica: kinks, viscous drag, and torsional stress," Phys. Rev. Lett. **85** (2000) 4827.

65. C. W. Wolgemuth, T. R. Powers, R. E. Goldstein, "Twirling and whirling: viscous instabilities of rotating elastica," Phys. Rev. Lett. **84** (2000) 1623.

66. R. E. Goldstein, T. R. Powers, and C. H. Wiggins, "Viscous nonlinear dynamics of twist and writhe," Phys. Rev. Lett. **80** (1998) 5232.

67. T. R. Powers, D. Zhang, R. E. Goldstein, and H. A. Stone, "Propagation of a topological transition: the Rayleigh instability," Phys. Fluids **10** (1998) 1052.

68. R. D. Kamien and T. R. Powers, "Determining the anchoring strength of a capillary using topological defects," Liq. Cryst. **23** (1997) 213.

69. T. R. Powers and R. E. Goldstein, "Pearling and pinching: propagating Rayleigh instabilities," Phys. Rev. Lett. **78** (1997) 2555.

70. R. E. Goldstein, P. Nelson, T. R. Powers, and U. Seifert, "Front propagation in the pearling instability of tubular vesicles," J. Phys. France II **6** (1996) 767.
71. T. Powers and P. Nelson, "Fluctuating membranes with tilt order," J. Phys. France II **5** (1995) 1671.
72. P. Nelson, U. Seifert, and T. Powers, "Dynamic theory of pearling instability in cylindrical vesicles," Phys. Rev. Lett. **74** (1995) 3384.
73. W. Cai, T. C. Lubensky, P. Nelson, and T. Powers, "Measure factors, tension, and correlations of fluid membranes," J. Phys. France II **4** (1994) 931.
74. P. Nelson and T. Powers, "Renormalization of chiral couplings in tilted bilayer membranes," J. Phys. France II **3** (1993) 1535.
75. P. Nelson and T. Powers, "Rigid chiral membranes," Phys. Rev. Lett. **69** (1992) 3409.

Conference Proceedings

1. T. R. Powers, R. E. Goldstein, and C. H. Wiggins, "Supercoiling bacterial filaments," in *Biological Physics: Third International Symposium*, H. Frauenfelder, G. Hummer, and R. Garcia, eds. (American Institute of Physics, Woodbury, New York 1999) p. 271. (refereed)

Book Reviews

1. T. R. Powers, "Livin' la Vida Micro," American Scientist **98** (2010) 86.
2. T. R. Powers, "Review of *A gallery of fluid motion*," American Journal of Physics **72** (2004) 1262.

Chapters in Books

1. T. R. Powers, "Mechanics of lipid bilayer membranes," *The handbook of materials modeling*, S. Yip, ed. (Springer, Dordrecht, 2005) 2631–2643.

On-line Journal Club for Condensed Matter Physics Commentaries

1. T. R. Powers, Commentary on "Theory of liquid crystal elastomers and polymer networks: connection between neoclassical theory and differential geometry," by Nguyen and J. Selinger, `www.condmatjclub.org` (July 2018).
2. T. R. Powers, Commentary on "Squirmers in nematic liquid crystals: Guiding microswimmers by an anisotropic medium," by Lintuvuori, Würger, and Stratford, `condmatjournalclub.org` (June 2017).
3. T. R. Powers, Commentary on "Stacked endoplasmic reticulum sheets are connected by helicoidal membrane motifs" by Terasaki et al.; and "Terasaki spiral ramps in the rough endoplasmic reticulum," by Guven, Huber, and Valencia, `www.condmatjclub.org` (December 2014).
4. T. R. Powers, Commentary on "Waving transport and propulsion in a generalized Newtonian fluid," by J. Rodrigo-Vélez-Cordero and E. Lauga; and "Physics of rheologically enhanced propulsion: Different strokes in generalized Stokes," by T. D. Montenegro-Johnson, D. J. Smith, and D. Loghin, `www.condmatjclub.org` (December 2013).
5. T. R. Powers, Commentary on "Flagellar synchronization independent of hydrodynamic interactions," by Friedrich and Jülicher, `www.condmatjclub.org` (October 2012).
6. T. R. Powers, Commentary on "Undulatory swimming in viscoelastic fluids," by Shen and Arratia, `www.condmatjclub.org` (June 2011).

7. T. R. Powers, Commentary on "Entropic driven self-assembly of nonamphiphilic colloidal membranes," by Barry and Dogic, `www.condmatjclub.org` (August 2010).
8. T. R. Powers, Commentary on "Cooperativity and frustration in protein-mediated parallel actin bundles," by Shin, Drew, Bartles, Wong, and Grason, `www.condmatjclub.org` (December 2009).
9. T. R. Powers, Commentary on "Controlled propulsion of artificial magnetic nanostructured propellers," by Ghosh and Fisher, `www.condmatjclub.org` (May 2009).

Invited Presentations (including upcoming talks)

1. **Invited Talk**, The Many Faces of Active Mechanics, Kavli Institute for Theoretical Physics, University of California, Santa Barbara (October 2024).
2. **Invited Lecturer** (three lectures), Boulder School for Condensed Matter and Materials Physics: Hydrodynamics Across Scales, Boulder, CO (July 2022).
3. **Invited Talk**, Mechanics of Life Workshop, Flatiron Institute (May 2022).
4. **Invited Talk**, Program on Numerical Methods and New Perspectives for Extended Liquid Crystalline Systems, ICERM, Brown University (December 2019).
5. **Invited Talk**, Growth, Form, and Self-organization Follow-on Meeting, Isaac Newton Institute for Mathematical Science, University of Cambridge, UK (March 2019).
6. **Lecture**, Microswimmer Lecture Series, School of Science, Technische Universität Dresden (January 2019).
7. **Invited Talk**, Dynamics Days Europe 2018, Dynamics of Active Matter Minisymposium, Loughborough University, UK (September 2018).
8. **Invited Talk**, Banff International Research Station for Mathematical Innovation and Discovery, Workshop on Complex Fluids in Biological Systems, Banff, Canada (July 2018).
9. **Invited Talk**, Geometry of Soft Matter Workshop, Natal, Brazil (May 2018).
10. **Invited Speaker**, Conference on Modeling Complex Fluids and Gels for Biological Applications, University of Utah (May 2017).
11. **Minisymposium speaker**, Frontiers in Applied & Computational Mathematics, New Jersey Institute of Technology, Newark, NJ (June 2015).
12. **Invited Speaker**, APS March Meeting, GSOFT Focus Session on Swimmers, San Antonio, TX (March 2015).
13. **Invited Talk**, Greater Boston Area Statistical Mechanics Meeting, Brandeis University, (October 2014).
14. **Invited Speaker**, Session on Hydrodynamics of Swimming Microorganisms, 50th Annual Technical Meeting of the Society of Engineering Science, Providence, RI (July 2013).
15. **Invited Speaker**, Minisymposium: Mechanics of biomolecular complexes and cell motility, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA (June 2013).
16. **Invited Lecturer**, (two lectures) Forces and Flow in Biological Systems, physics summer school sponsored by German Physical Society, Bonn, Germany (September 2012).

17. **Invited Speaker**, Biological Complex Fluids, summer school, Cargése, Corsica Island, France (July 2012).
18. **Invited Lecturer**, (four lectures) Soft Solids and Complex Fluids, summer school, UMass Amherst, Amherst, MA (June 2012).
19. **Invited Speaker**, American Physical Society March Meeting, Invited Session on Physical Mechanisms of Collective Microbial Dynamics, Boston, MA (March 2012).
20. **Invited Speaker**, Jülich Soft Matter Days, Gustav-Stresemann-Institut, Bonn, Germany (November 2011).
21. **Invited Lecturer** (four lectures), Workshop on Mechanics of Soft and Biological Matter, Abdus Salam International Center for Theoretical Physics, Trieste, Italy (May 2011).
22. **Seminar**, Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution (July 2010).
23. **Guest Lecturer**, "Exploring the Interface of Nanotechnology and Biology," Summer at Brown Program for high school students (July 2010).
24. **Invited Speaker**, US National Congress on Theoretical and Applied Mechanics, symposium on Mechanics of Locomotion in Fluids, Penn State University (June 2010).
25. **Invited Speaker**, Minisymposium: Coarse-grained Stochastic Models in Soft Condensed Matter, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA (May 2010).
26. **Keynote Speaker**, Minisymposium: Modeling and Computational Methods for the Mechanics of Biological Systems, IV European Conference on Computational Mechanics, Paris, France (May 2010).
27. **Invited Speaker**, Workshop: "Driven Microfluidic Systems," Atlantic Centre for Atomistic Modeling, University College Dublin, Ireland (May 2009).
28. **Invited Speaker**, mini-workshop, "Geometry, Topology and Nonlinearity in Biophysics: conformations of DNA, Polymers and Such," Université de Cergy-Pontoise, France (March 2009).
29. **Invited Speaker**, Minisymposium: Complex fluids in biological systems, SIAM Life Sciences 2008, Montreal, Canada (August, 2008).
30. **Invited Speaker**, Minisymposium: Mathematical modeling and simulation of biological membranes, SIAM Annual Meeting 2008, San Diego, CA (July, 2008).
31. **Invited Lecturer**, Nanomechanics: From Cells to Solids, Summer School, Caltech (July 2007).
32. **Invited Speaker**, BIOWorkshop 2007, "Physics Inspired by Biology," Fine Theoretical Physics Institute, University of Minnesota (May 2007).
33. **Invited Speaker**, Minisymposium: Stochastic Modeling of Biological Systems, 2006 SIAM Annual Meeting, Boston, MA (July 2006).
34. **Guest Lecturer**, New Directions Short Course: Biophysical Fluid Dynamics, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, MN (June 2006).
35. **Invited Speaker**, American Physical Society March Meeting, Invited Session on Bacterial flagellar dynamics, polymorphism, and conformational spread, Baltimore, MD (March 2006).

36. **Keynote Speaker**, International Conference on Computational & Experimental Engineering and Sciences, Symposium on Mechanics and Biology, Chennai, India (December 2005).
37. **Invited Speaker**, SIAM Annual Meeting, Minisymposium on Geometry of Materials, New Orleans, LA (July 2005).
38. **Invited Speaker**, Fourth IMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena, Theory and Computation, Session on solitary waves and nonlinear patterns on compact spaces, Athens, GA (April 2005).
39. **Invited Speaker**, Workshop on Opportunities in Materials Theory, National Science Foundation, Arlington, VA (October 2004).
40. **Invited Speaker**, 228th National Meeting of the American Chemical Society, Session on Complex Fluids Philadelphia, PA (August 2004).
41. **Invited Speaker**, 21st International Congress of Theoretical and Applied Mechanics, Minisymposium on Tissue, Cellular, and Molecular Biomechanics, Warsaw, Poland (August 2004).
42. **Invited Speaker**, Minisymposium on Quantitative Approaches to Biology, SIAM Conference on Mathematical Aspects of Materials Science, Los Angeles, CA (May 2004).
43. **Invited Speaker**, American Physical Society March Meeting, Invited Session on Mechanics of Self-assembled Structures, Montreal, Canada (March 2004).
44. **Invited Speaker**, Mathematical Aspects of Material Science: Discrete and Continuum Descriptions of Matter, Castle Ringberg, Germany (February 2004).
45. **Invited Speaker**, Joint Mathematics Meeting (American Mathematical Society and Mathematical Association of America), Minisymposium on Nonlinear Elasticity, Phoenix, AZ (January 2004).
46. **Invited Speaker**, Symposium on Molecular and Cellular Biomechanics, 40th Annual Technical Meeting of the Society of Engineering Science, Ann Arbor, MI (October 2003).
47. **Invited Speaker**, Paris-Institut Henri Poincaré Workshop on Dynamics, Growth, and Singularities of Continuous Media, Paris, France (July 2003)
48. **Invited Speaker**, Society for Industrial and Applied Mathematics Conference on Applications of Dynamical Systems (DS03); Minisymposium on Elastic Growth and Morphogenesis: Theory and applications, Snowbird, UT (May 2003)
49. **Invited Speaker**, 14th New England Workshop on Complex Fluids (March 2003).
50. **Invited Lecturer** (four lectures), Boulder School for Condensed Matter and Materials Physics: Physics of Soft Condensed Matter, Boulder, CO (July 2002).
51. **Invited Speaker**, 2002 Society for Industrial and Applied Mathematics 50th Anniversary and Annual Meeting, Session on Geometry in Soft Matter and Biological Physics, Philadelphia, PA (July 2002).
52. **Invited Speaker**, Dynamics Days 2002, Baltimore, MD (January 2002).
53. **Invited Lecture**, Seventh Annual T. Francis Ogilvie Young Investigator Lectureship in Ocean Engineering, Department of Ocean Engineering, MIT (October 2001).
54. **Invited Speaker**, Workshop on Atomistic to Continuum Models for Long Molecules and Thin Films, Ascona, Switzerland (July 2001).

55. **Invited Speaker**, 21st Annual International Conference, Los Alamos National Laboratory Center for Nonlinear Studies: Principles of Soft Matter, Santa Fe, NM (May 2001).
56. **Invited Lecturer** (two lectures), Biophysics Winter School, Korea Institute of Advanced Studies, Seoul, Korea (February 2001).
57. **Invited Speaker**, California Coordinating Committee for Nonlinear Science (CCC-NLS) workshop, "Soft matter as a nonlinear science," Newport Beach, CA (February 2001).
58. **Invited Speaker**, Society for Engineering Sciences, Symposium on Mechanics at the Nanoscale, Columbia, SC (October 2000).
59. **Invited Lecturer** (four lectures), Santa Fe Institute, Complex Systems Summer School (June 2000).
60. **Invited Speaker**, Third Society for Industrial and Applied Mathematics Conference on Mathematical Aspects of Materials Science, Philadelphia, PA (May 2000).
61. **Invited Speaker**, American Physical Society March Meeting, Symposium on Dynamics of DNA and Other Microscopic Rods, Atlanta, GA (March 1999).
62. **Invited Speaker**, 1997 Materials Research Society Meeting, Session on Complex Fluids and Biomaterials, Boston, MA (December 1997).

Seminars (including upcoming talks)

1. **Seminar**, Laboratoire d'Hydrodynamique de l'Ecole polytechnique (LadHyX), Palaiseau, France (June 2024).
2. **Seminar**, Center for Mathematical Biology, University of Pennsylvania, (October 2023).
3. **Seminar**, Physics and Astronomy Complex Systems Seminar, Northwestern University, (June 2023).
4. **Seminar**, InterDisciplinary made EAsy seminar, Brown Center for Theoretical Physics, Brown University (April 2023).
5. **Short Talk**, Brandeis MRSEC Winter School, Crawford Notch, NH (February 2023).
6. **Seminar**, Mechanical Engineering, Michigan State University, (September 2022).
7. **Seminar**, Applied and Computational Mathematics Seminar, Department of Mathematics, University of Wisconsin, Madison (April 2022).
8. **Graduate Research Seminar**, Physics Department, University of Texas, San Antonio (March 2022).
9. **Short Talk**, Brandeis MRSEC Winter School, Chittenden, VT (February 2022).
10. **Virtual Colloquium**, Physics Department, Cal Poly San Luis Obispo (April 2021).
11. **Virtual Seminar**, Bioactive fluids virtual seminar series, UK Biofluids Special Interest Group (December 2020).
12. **Virtual Seminar**, Fluids at Brown Seminar Series, Brown University (April 2020).
13. **Short Talk**, Brandeis MRSEC Winter School, Crawford Notch, NH (February 2020).
14. **Seminar**, Complex Systems Seminar Series, Department of Physics and Astronomy, Northwestern University (November 2019).

15. **Seminar**, Mathematical Biology, University of Birmingham, UK (January 2019).
16. **Seminar**, Biological & Soft Matter Seminar, Center for Physics and Chemistry of Living Systems, Tel Aviv University (December 2018).
17. **Seminar**, Mechanical Engineering and Materials Science Seminar Series, Yale University (October 2018).
18. **Seminar**, Mechanics Journal Club, Department of Engineering—Mechanical Engineering, Aarhus University, Aarhus, Denmark (December 2017).
19. **Seminar**, Mechanics Seminar, Department of Mechanical and Industrial Engineering, Northeastern University (October 2017).
20. **Seminar**, Programme on Growth, Form, and Self-Organization, Newton Institute for Mathematical Sciences, University of Cambridge, UK (August 2017).
21. **Talk**, Brandeis Materials Research Science and Engineering Center Retreat (November 2016).
22. **Colloquium**, Department of Physics, Indiana University (September 2016).
23. **Seminar**, Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution (July 2016).
24. **Seminar**, Biolunch Seminar, Division of Applied Mathematics and Theoretical Physics, University of Cambridge, UK (May 2016).
25. **Colloquium**, Department of Physics, Brandeis University (November 2015).
26. **Seminar**, Applied and Computational Mathematics Seminar, Department of Mathematics, University of Wisconsin-Madison (April 2015).
27. **Seminar**, Department of Mechanical Engineering, University of Houston (September 2014).
28. **Colloquium**, Department of Physics, Wesleyan University (April 2014).
29. **Seminar**, Material Research Science and Engineering Center, Brandeis University (November 2013).
30. **Seminar**, Engineering Science and Mechanics Department, Virginia Polytechnic Institute and State University (November 2013).
31. **Seminar**, Center for Advanced Materials Research, Brown University (January 2013).
32. **Seminar**, Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania (December 2012).
33. **Seminar**, Lefschetz Center for Dynamical Systems, Division of Applied Mathematics, Brown University (November 2012).
34. **Seminar**, Laboratoire Matiére et Systémes Complexes, University of Paris Diderot (July 2012).
35. **Seminar**, Mathematical Biology Seminar, Department of Mathematics, UC Davis (April 2012).
36. **Seminar**, Joint Boston University/Brown University PDE seminar; Division of Applied Mathematics, Brown University (November 2011).
37. **Seminar**, G. N. Bisanar Frontiers of Science Series; Department of Physics, Georgia Tech (October 2011).

38. **Seminar**, Mechanics: Modeling, Experimentation, Computation; Department of Mechanical Engineering, MIT (April 2011).
39. **Seminar**, Soft Matter Seminar, Department of Physics, Georgetown University (February 2011).
40. **Seminar**, Widely Applied Mathematics Seminar, School of Engineering and Applied Sciences, Harvard University (January 2011).
41. **Seminar**, Condensed-matter Physics, Brown University (November 2010).
42. **Colloquium**, American Physical Society Editorial Offices, Ridge, NY (September 2010).
43. **Seminar**, Geophysical Fluid Dynamics Program, Woods Hole Oceanographic Institution (July 2010).
44. **Seminar**, Mechanical Engineering Department, Boston University (May 2010).
45. **Seminar**, Institut Jean le Rond d'Alembert, Université Paris VI, Paris, France (May 2010).
46. **Seminar**, Applied Math Lab, Courant Institute, New York University (April 2010).
47. **Colloquium**, Department of Physics, Clark University (April 2010).
48. **Seminar**, Department of Physics, Worcester Polytechnic Institute (April 2010).
49. **Seminar**, Department of Mechanical and Industrial Engineering, Northeastern University (April 2010).
50. **Seminar**, Quantitative and Computational Biology Seminar Series, Lewis-Sigler Institute for Integrative Genomics, Princeton University (April 2010).
51. **Seminar**, Mechanical Engineering Seminar Series, Johns Hopkins University (April 2010).
52. **Colloquium**, Materials Science and Engineering, Boston University (March 2010).
53. **Seminar**, Physics Department, University of Massachusetts, Amherst (November 2009).
54. **Seminar**, Aspen Center for Physics, Workshop on Filamentous Assemblies: Complex Ordering from Biopolymers to Nano-rods (August 2009).
55. **Guest Lecturer**, "Exploring the Interface of Nanotechnology and Biology," Summer at Brown Program for high school students (July 2009).
56. **Seminar**, Physics Department, Technische Universität München, Garching, Germany (April 2009).
57. **Seminar**, Laboratoire de Physique et Mécanique des Milieux Hétérogènes, École Supérieure de Physique et de Chimie Industrielles, Paris, France (March 2009).
58. **Seminar**, Laboratoire Physico-Chimie Curie, Institut Curie, Paris, France (March 2009).
59. **Seminar**, Department of Mechanical Engineering, Yale University (March 2009).
60. **Colloquium**, Department of Physics, Worcester Polytechnic Institute (December 2008).
61. **Seminar**, Department of Mechanical Science and Engineering, University of Illinois, Urbana-Champaign (December 2008).

62. **Seminar**, Division of Physical Chemistry, University of California, Los Angeles (November 2008).
63. **Seminar**, Department of Physics and Astronomy, University of Pennsylvania (October 2008).
64. **Seminar**, Departmental Undergraduate Group, Brown University(October 2008).
65. **Seminar**, Department of Mechanical and Aerospace Engineering, University of California, San Diego (October 2008).
66. **Guest Lecturer**, "Exploring the Interface of Nanotechnology and Biology," Summer at Brown Program for high school students (July 2008).
67. **Colloquium**, Department of Physics, University of Oregon (May 2008).
68. **Colloquium**, Department of Physics, Amherst College (April 2008).
69. **Colloquium**, Department of Mathematical Sciences, New Jersey Institute of Technology (March 2008).
70. **Colloquium**, Department of Physics, Dartmouth College (Novermber 2007).
71. **Guest Lecturer**, "Exploring the Interface of Nanotechnology and Biology," Summer at Brown Program for high school students (July 2007).
72. **Seminar**, Orthopaedics Research Noon Meeting, Department of Orthopaedics, Brown Medical School (May 2007).
73. **Seminar**, Mechanics: Modeling, Experimentation, Computation; Department of Mechanical Engineering, MIT (March 2007).
74. **Seminar**, Joint Biophysics and Condensed-matter Seminar, Boston University (December 2006).
75. **Seminar**, Machines and Organisms: Locomotion and Manipulation seminar series, Cornell University (December 2006).
76. **Colloquium**, Physics Department, Brandeis University (December 2006).
77. **Seminar**, Center for Cell Analysis and Modeling Friday Lab Meeting, University of Connecticut Health Center (November 2006).
78. **Seminar**, Summer Research Program, Science Center, Wellesley College (August 2006).
79. **Seminar**, Brown University MRSEC Research Experience for Teachers (August 2006).
80. **Seminar**, Theoretical Physics Group, The Institute of Mathematical Sciences, C.I.T. Campus, Chennai, India (December 2005).
81. **Group Meeting Presentation**, Raman Research Institute, Bangalore, India (December 2005).
82. **Seminar**, Applied Math Seminar, Courant Institute, New York University (October 2005).
83. **Seminar**, Hatsopoulos Microfluids Seminar Series, MIT (September 2005).
84. **Seminar**, The Biocomplexity Institute, Indiana University (September 2005).
85. **Invited Speaker**, SIAM Annual Meeting, Minisymposium on Geometry of Materials, New Orleans, LA (July 2005).

86. **Seminar**, Brown University MRSEC Research Experience for Teachers (July 2005).
87. **Presentation** (2 lectures/demonstrations), Brown University MRSEC Teacher's Institute (April 2005).
88. **Seminar**, Solid Mechanics and Materials Science Seminar, Brown University (December 2004).
89. **Presentation**, Geometry and Materials Physics Workshop, Aspen Center for Physics, Aspen, CO (June 2004)
90. **Seminar**, Theoretical and Applied Mechanics, University of Illinois at Urbana-Champaign (February, 2004).
91. **Seminar**, Department of Mechanical Engineering, Columbia University (December 2003).
92. **Seminar**, Department of Physics, Clark University (October 2003).
93. **Seminar**, Mathematical Biosciences Institute, Ohio State University (October 2003).
94. **Colloquium**, Department of Mechanical and Aerospace Engineering, Rutgers University (September 2003).
95. **Presentations** (2 lectures/demonstrations), Brown University MRSEC Teacher's Institute (May 2003).
96. **Seminar**, Computational Biology Seminar Series, Department of Biomathematics, UCLA Medical Center (April 2003).
97. **Seminar**, Rowland Institute at Harvard (March 2003).
98. **Seminar**, Brown University MRSEC (January 2003).
99. **Seminar**, Physics Department, University of Massachusetts, Amherst (October 2002).
100. **Seminar**, Computation in Science Seminar, University of Chicago (September 2002).
101. **Colloquium**, Applied Mathematics, University of Arizona (September 2002).
102. **Presentation** (four lectures), R. Phillips and X.-G. Zhang group meetings, Engineering and Applied Science, California Institute of Technology (September 2002).
103. **Seminar**, Mechanical Engineering, University of Rhode Island (April 2002).
104. **Colloquium**, Applied Mechanics, Harvard University (February 2002).
105. **Presentation**, H. Berg group meeting at Harvard University, Molecular and Cellular Biology (October 2001).
106. **Seminar**, Applied Mathematics Lab, Courant Institute, New York University (October 2001).
107. **Seminar**, Joint Solid Mechanics and HKS seminar, Brown University (September 2001).
108. **Seminar**, Physics Department, Clark University (June 2001).
109. **Seminar**, Condensed-matter Physics, Brown University (April 2001).
110. **Seminar**, Biomedical Engineering Seminar Series, Brown University (November 2000).
111. **Colloquium**, Program in Applied and Computational Mathematics, Princeton University (November 2000).

112. **Department Seminar**, Department of Aerospace Engineering and Mechanics, University of Minnesota (October 2000).
113. **Colloquium**, Department of Physics, University of Michigan (September 2000).
114. **Colloquium**, Los Alamos National Laboratory, Center for Nonlinear Studies (August 2000).
115. **Seminar**, Center for Interdisciplinary Research on Complex Systems, Northeastern University (May 2000).
116. **Colloquium**, Physics Department, Washington University, St. Louis (April 2000).
117. **Seminar**, Department of Physics, Brandeis University (April 2000).
118. **Seminar**, Solid Mechanics Group, Division of Engineering, Brown University (March 2000).
119. **Seminar**, Applied Mathematics, Penn State University (March 2000).
120. **Seminar**, Department of Physics, George Washington University (March 2000).
121. **Seminar**, Department of Mechanical Engineering, Northwestern University (February 2000).
122. **Seminar**, Department of Chemical Engineering, Northeastern University (February 2000).
123. **Seminar**, Department of Physics, City College of CUNY, (February 2000).
124. **Seminar**, Levich Institute, City College of CUNY (February 2000).
125. **Seminar**, Department of Physics, University of Minnesota (February 2000).
126. **Seminar**, Center for Bio-Dynamics, Boston University (January 2000).
127. **Seminar**, Courant Institute of Mathematical Sciences, New York University (December 1999).
128. **Seminar**, Exxon Research and Engineering, Annandale, NJ (November 1999).
129. **Seminar**, Mechanical Engineering Department, Massachusetts Institute of Technology (June 1999).
130. **Seminar**, Mechanical Engineering Department, Yale University (April 1999).
131. **Seminar**, Chemical Engineering Department, Tufts University (March 1999).
132. **Colloquium**, Physics Department, Worcester Polytechnic Institute(March 1999).
133. **Seminar**, Condensed-matter Physics, Princeton University (October 1998).
134. **Seminar**, Physics Department, University of Chicago (July 1998).
135. **Colloquium**, Physics Department, University of Missouri (April 1998).
136. **Seminar**, Applied Mathematics, Massachusetts Institute of Technology (December 1997).
137. **Seminar**, Center for Interdisciplinary Research on Complex Systems, Northeastern University (December 1997).
138. **Seminar** Physics Department, Clark University, (October 1997).
139. **Seminar**, Condensed-matter Physics, Boston University (September 1997).

140. **Seminar**, Condensed-matter Physics, Brown University (September 1997).
141. **Colloquium**, Physics Department, Dartmouth College, (April 1997).
142. **Seminar**, Condensed-matter Physics, Case Western Reserve University, (January 1997).
143. **Seminar**, Aspen Center for Physics, Session on Defects in Soft Condensed Matter Physics, Aspen, CO (August, 1996).
144. **Seminar**, High-energy Physics, Syracuse University (April 1996).
145. **Seminar**, Condensed-matter Physics, Princeton University, (November 1995).
146. **Seminar**, Condensed-matter Physics, Cornell University (February 1995).
147. **Seminar**, Exxon Research and Engineering, Annandale, NJ (February 1995).
148. **Seminar**, Les Houches Summer School on Fluctuating Geometries in Statistical Mechanics and Field Theory, Les Houches, France (August 1994).
149. **Seminar**, Institute for Advanced Study, Princeton, NJ (April 1994).
150. **Seminar**, Center for Bio/Molecular Science and Engineering, Naval Research Lab, Washington, D.C. (January 1994).

Contributed Talks and Posters

1. **Contributed Talk**, Fluid & Elasticity 2024, Arcachon, France (June 2024).
2. **Contributed Talk**, APS Division of Fluid Dynamics Meeting, Session: Biofluids: Large Vessels and Arteries III, Washington, D. C. (November 2023).
3. **Contributed Talk**, APS Division of Fluid Dynamics Meeting, Session: Active Matter IV: Active Gels, Drops, and Particles, Indianapolis (November 2022).
4. **Contributed Talk**, APS Division of Fluid Dynamics Meeting, Session on Surface Tension Effects: Interfacial Phenomena I, Atlanta (November 2018).
5. **Contributed Talk**, APS March Meeting, Session on Soft Interface Mechanics, Los Angeles (March 2018).
6. **Contributed Talk**, APS March Meeting, Session on Bio-inspired Materials, New Orleans (March 2017).
7. **Contributed Talk**, American Physical Society Division of Fluid Dynamics Meeting, Boston, MA (November 2015).
8. **Contributed Talk**, Fluid & Elasticity 2015, Biarritz, France (June 2015).
9. **Contributed Talk**, Society of Rheology Meeting, Session on Biomaterials and Biological Systems, Philadelphia, PA (October 2014).
10. **Contributed Talk**, American Physical Society March Meeting, Session on Biophysical Dynamics and Locomotion, Denver, CO (March 2014).
11. **Contributed Talk**, American Physical Society Division of Fluid Dynamics Meeting, Session on Biofluids: Locomotion—non-Newtonian fluids, Pittsburgh, PA (November 2013).
12. **Contributed Talk**, American Physical Society Division of Fluid Dynamics Meeting, Session on Bio-Fluids: Cellular: Vesicles. Baltimore, MD (November 2011).
13. **Contributed Talk**, American Physical Society March Meeting, Session on Lipid Bilayers and Biological Membranes: Dynamics and Thermodynamics, Dallas, TX (March

2011).

14. **Contributed Talk**, American Physical Society March Meeting, Focus Session: Nonlinear Hydrodynamics of Swimming Cells, Portland, OR (March 2010).
15. **Contributed Talk**, American Physical Society Division of Fluid Dynamics Meeting, Session on Bio-Fluids: Wakes and Mixing II, San Antonio, TX (November 2008).
16. **Contributed Talk**, American Physical Society March Meeting, Session on Bacterial Flagella, Cellular Motion, and Chemotaxis, Austin, TX (March 2003).
17. **Contributed Talk**, American Physical Society March Meeting, Session on Polymer-cell Interactions, Indianapolis, IN (March 2002).
18. **Contributed Talk**, American Physical Society Division of Fluid Mechanics Meeting, Session on Bio-fluid Dynamics, San Diego, CA (November 2001).
19. **Contributed Talk**, American Physical Society Division of Fluid Mechanics Meeting, Session on Bio-fluid Dynamics, New Orleans, LA (November 1999).
20. **Contributed Talk**, American Physical Society Division of Fluid Mechanics Meeting, Session on Bio-fluid Dynamics, Philadephia, PA (November 1998).
21. **Contributed Talk**, American Institute for Chemical Engineering meeting, session on Fundamental Research in Fluid Mechanics, Miami Beach, FL (November 1998).
22. **Contributed Talk**, 3rd International Symposium on Biological Physics, Santa Fe, NM (September 1998).
23. **Contributed Talk**, March Meeting of the American Physical Society, Session on Nonlinear Phenomena, Los Angeles, CA, Session on Pattern Formation/Topology Change (March 1998).
24. **Poster**, 1997 Materials Research Society Meeting, Session on Complex Fluids and Biomaterials, Boston, MA (December 1997).
25. **Poster**, Biomaterials and Complex Fluids Workshop, Brandeis University, (October 1997).
26. **Poster**, Liquid Crystals Gordon Research Conference, Tilton, NH (June, 1997).
27. **Contributed Talk**, March Meeting of the American Physical Society, Session on Nonlinear Phenomena, Kansas City, MO (March 1997).
28. **Contributed Talk**, American Physical Society Division of Fluid Mechanics Meeting, Session on Drop Formation and Breakup, Syracuse, NY (November 1996).
29. **Poster**, Collective Phenomenon in Physics Conference, London, Ontario (June 1996).
30. **Contributed Talk**, March Meeting of the APS, Session on Membranes and Lipid Physics, St. Louis, MO (March 1996).
31. **Contributed Talk**, Materials Research Society Fall Meeting, Complex Fluids Session (talk 1) (December 1995).
32. **Contributed Talk**, Materials Research Society Fall Meeting, Complex Fluids Session (talk 2) (December 1995).
33. **Contributed Talk**, March Meeting of the APS, Session on Membranes and Lipid Physics, San Jose, CA (March 1995).
34. **Poster**, March Meeting of the American Physical Society, Pittsburgh, PA (March 1994).

35. **Contributed Talk**, 1993 Materials Research Society Meeting, Session on Complex Fluids, Boston, MA (November 1993).

Current Support

- Hazeltine Innovation Award, *The flow of cerebrospinal fluid in the glymphatic system* (co-PI with PI R. Zenit and co-PI M. Rodriguez; one-year no-cost extension to 6/30/25); 7/1/23–6/30/24.
- NSF CBET-2227361, *Active fluids in externally driven flows* (PI with co-PI R. Pelcovits); 9/1/22–8/31/25.
- NSF DMR-MRSEC 2011486, *Brandeis center for bioinspired soft materials*; (subaward to Brown University) 9/1/20–8/31/26.

Past Support

- NSF CMMI-2020098, *Shape and deformation of colloidal membranes* (PI with co-PI R. Pelcovits); 9/1/20–8/31/24.
- NSF MRSEC DMR-1420382, *Brandeis center for bioinspired soft materials*; (subaward to Brown University with K. Breuer, R. Oldenbourg, and R. Pelcovits); 11/1/14–10/31/21.
- NSF CMMI-1634552, *Mechanics of colloidal membranes* (PI with co-PI R. Pelcovits); 9/1/16–8/31/20.
- NSF CBET-1437195, *Locomotion and transport in a liquid crystal*; 9/1/14–8/31/19.
- NSF CBET-1336638, *Pushing & pulling, bending & buckling; viscosity and elasticity in flagellar swimming*; (with K. Breuer (PI)); 9/1/13–8/31/17.
- NSF CBET-0854108, *Collaborative Research: Fundamental principles of swimming in viscoelastic media*; (PI with co-PIs K. Breuer at Brown University and A. Kudrolli at Clark University); 9/1/09–8/31/13.
- COBRE Pilot Project, *Role of fluid flow in nutrient transport in 3d chondrocyte culture*; (with V. Shenoy); 12/1/08–7/31/09.
- NSF DMS-0615919, *Mathematical models for swimming in a viscoelastic fluid*; 9/1/06–8/31/09.
- NSF CTS NIRT-0404031, *NIRT: Theoretical nanomechanics: from cells to solids*; (with M. Geller (PI), University of Georgia; M. Blencowe, Dartmouth College; and R. Phillips, Caltech); 7/01/04–6/30/09.
- NSF DMR-0320676, *Acquisition of a Scanning Probe Microscope for Studies of Biomolecules and Nanoscale Materials and Devices* (with Jay X. Tang (PI), Gang Xiao, James M. Valles, and Xinsheng Sean Ling); 9/1/03–8/31/04.
- Brown University Research Seed Funding Award, *Seed Funds in the Area of Biomaterials* (with C. Briant (PI), K. Breuer, D. Hoffmann-Kim, J. Morgan, and T. Palmore); 1/1/03–12/31/03.
- DARPA Biomolecular Motors, *Engineered bacterial transportation systems*, with K. Breuer (PI), H. Berg, G. Huber, and L. Turner; 6/1/02–12/31/03.
- NSF CAREER grant CMS-0093658, *Growth and form in biological systems: a micromechanical approach*, 6/1/01–5/31/07.
- *Mechanics of self-assembled biological microstructures: membrane tethers*, Brown Division of Engineering MRSEC seed funding, 2001–2003.

- Brown University startup.

Teaching

a. Brown University

- (Spring 2025, 2024, 2012, 2006, 2005, 2004) **ENGN 0040** *Engineering Statics and Dynamics* (before 2024: *Dynamics and Vibrations*). (Undergraduate) Second-semester, first-year introductory course in engineering, covering statics kinematics, Newton's laws, and energy methods. (Before 2025: rigid-body dynamics and vibrations.) Design projects.
- (Fall 2023, Fall 2021) **ENGN 2912J** *Asymptotic and Perturbation Theory.* (Graduate). In this introductory course to perturbation methods, topics covered are inspired by problems in solid mechanics (e.g. ridges and kinks in thin plates) and fluid mechanics (e.g. viscous boundary layers), and include regular and singular perturbations, methods of strained coordinates, multiple scales, averaging, WKB, Laplace's method and the method of steepest descent for approximating integrals, and solutions of partial differential equations.
- (Spring 2023 as **ENGN 2912F**, Spring 2019, Fall 2015, Fall 2008) **ENGN 2470** (formerly **ENGN 2912F**) *Soft Matter* (Cross-listed as **PHYS 2470** *Advanced Statistical Mechanics* in 2015 and 2021). (Graduate) An advanced course on soft matter, including polymers, liquid crystals, surfactants, and colloids.
- (Fall 2022) **ENGN 2810** *Fluid Mechanics I.* (Graduate) Formulation of the basic conservation laws for a viscous, heat conducting, compressible fluid. Molecular basis for thermodynamic and transport properties. Kinematics of vorticity and its transport and diffusion. Introduction to potential flow theory. Viscous flow theory; the application of dimensional analysis and scaling to obtain low and high Reynolds number limits.
- (Spring 2022, Spring 2014, Spring 2013) **PHYS 2140** *Statistical Mechanics.* (Graduate) Thermodynamics. Probability. Kinetic theory of gases. Microcanonical, canonical, and grand canonical ensemble. Dilute gas and the van der Waals equation. Quantum statistical mechanics. Ideal quantum gases.
- (Spring 2021) **PHYS 2470** *Advanced Statistical Mechanics* (Cross-listed as **ENGN2470**) (Graduate) Phase transitions, elastic soft matter, liquid crystals, polymers and the renormalization group.
- (Fall 2020, 2019, 2010, 2002, 2001) **ENGN 0810** *Fluid Mechanics.* (Undergraduate) Junior-level fluid mechanics course, covering hydrostatics; mass, momentum, and energy conservation; control volume analysis; Navier-Stokes equations; boundary layers; compressible flow; and open-channel flows. Laboratory and computational project.
- (Fall 2018) **ENGN 2912H** *Interfacial Phenomena.* (Graduate) An introduction to mechanics of material interfaces. Particular cases considered are liquid surfaces, lipid membranes, and thin elastic plates and shells. The course will cover detailed analyses of statics and dynamics of these interfaces.
- (Fall 2017) **PHYS 2030** *Classical Theoretical Physics I.* (Graduate) Central forces, Lagrangian and Hamiltonian mechanics, systems with constraints, vibrations, rigid-body dynamics, Hamilton-Jacobi theory, action-angle variables. Introduction to continuum mechanics.
- (Spring 2018, 2017, 2016, 2015, 2014) **ENGN 1210** *Biomechanics.* (Undergraduate) Stress and strain, mechanical properties of bone and tissue. Elastic rods as models for bones: stretching, bending, twisting, and buckling. Fluid mechanics of blood flow. Viscoelasticity.
- (Fall 2016) **PHYS 1530** *Thermodynamics and Statistical Mechanics.* (Undergraduate) The laws of thermodynamics and heat transfer. Atomic interpretation in terms

of kinetic theory and elementary statistical mechanics. Applications to physical problems.

- (Fall 2012) **ENGN 0310** *Mechanics of Solids and Structures.* (Undergraduate) Mechanical behavior of materials and analysis of stress and deformation in engineering structures. Stress and strain; the elastic, plastic, and time-dependent response of materials; principles of structural analysis and application to simple bar structures, beam theory, instability and buckling, torsion of shafts; general three-dimensional states of stress; Mohr's circle; stress concentrations.
- (Fall 2011) **PHYS 2610E/ENGN 2912I** *Selected Topics in Physics of Locomotion.* (Graduate) Physical processes involved in locomotion at small scales in fluids.
- (Spring 2010, 2009, 2008) **ENGN 1370** *Advanced Engineering Mechanics.* (Undergraduate) A unified study of the dynamics of particles, rigid bodies, and deformable continua. Generalized coordinates and Lagrange's equations; variational principles; stability of equilibrium; vibrations of discrete systems and of elastic continua, and wave propagation.
- (Fall 2009, 2007) **ENGN 1930R** *Molecular and Cell Biology for Engineers.* (Undergraduate) Introduction to systems biology for advanced undergraduates and beginning graduate students. Regulation of transcriptional networks, robustness, and constrained evolutionary optimization.
- (Spring 2007) **ENGN 2020** *Mathematical Methods in Engineering and Physics II.* (Graduate) An introduction for graduate students to probability theory, eigenvalue problems, the calculus of variations, wave propagation and other partial differential equations of motion.
- (Fall 2005, 2004; Spring 2003, 2002, 2001) **EN 194 S03** *Solid Biomechanics*; renamed *Molecular and Cell Biology for Engineers* in 2005. (Undergraduate) Advanced undergraduate/beginning graduate course on the physics and mechanics of molecular and cell biology. Basic probability, random walks, basic statistical mechanics, polymers, membranes, self-assembly, and molecular motors.
- (Fall 2003, 2000) **EN 291 S28** *Molecular and Cellular Biomechanics.* (Graduate) Cellular physiology: enzyme kinetics, binding and saturation, oxygen transport, electrostatics in solution, electrochemical aspects of the cell, the Hodgkin-Huxley model of nerve impulse propagation, and the Huxley model of muscle contraction.

b. University of Arizona

- Spring 1998 **Math 697B** *Applied Mathematics Laboratory* (Graduate, co-taught with M. Tabor and J. Lega). Combination laboratory and lecture course on pattern formation in liquid crystals for advanced graduate students in applied mathematics, engineering, and physics.

c. Dartmouth College

- Spring 1997 **Physics 73** *Solid-state Physics.* (Undergraduate) A course for advanced undergraduates covering the basics of structure, scattering, elasticity, elementary excitations near $T = 0$, and electrons in a periodic potential.

Advising

a. Ph.D. Theses

- Myles (MunJu) Kim; Division of Engineering; Fluids, Chemical, and Thermal Processes group. Ph.D. May, 2004. Upon graduation, Munju became a Scott Visiting Assistant Professor at the Department of Mathematics of the University of Utah. He is currently data scientist at the Carter Immunology Center at the University of Virginia.

- Srikanth Srigiriraju, Division of Engineering, Mechanics of Solids and Structures group. Ph.D. May, 2006. Upon graduating, Srikanth became a research engineer at SIMULIA HQ, which is part of Dassault Systèmes. He is currently Director of Software Technical Services at Virtual Integrated Analytics Solutions.
- Elnaz Baum-Snow, Department of Physics. Ph.D. May, 2007. Upon graduation Elnaz became a postdoctoral fellow at Northwestern University in the Department of Physics & Astronomy and the Department of Biochemistry, Molecular Biology & Cell Biology. She was also a postdoctoral researcher in the Department of Cell Biology at the University of Connecticut Health Center.
- Hongyuan Jiang, Division of Engineering, Mechanics of Solids and Structures group. Ph.D. May, 2010. Upon graduation, Hongyuan became a postdoctoral associate in the Department of Mechanical Engineering at Johns Hopkins University. He is currently a professor in the Department of Modern Mechanics at the University of Science and Technology of China in Hefei, Anhui.
- Madison 'Ski' Krieger, School of Engineering, Fluids and Thermal Processes group. Ph.D. May, 2016. Upon graduating, Ski became a postdoctoral associate in the Department of Organismic and Evolutionary Biology at Harvard University. He is currently co-founder and Chief Data Scientist at Marble Therapeutics.
- Leroy Jia (co-advised with R. Pelcovits), Division of Applied Mathematics. Ph.D. May, 2018. Upon graduateion, Leroy became a postdoctoral association in the Computational Biology group at the Flatiron Institute. Leroy is currently a Mathematician at the National Institute of Standards and Technology.
- Lijie Ding (co-advised with R. Pelcovits), Department of Physics. Ph.D. June, 2022. Upon graduation, Lijie became a quantitative analyst at Goldman Sachs. Lijie is currently a postdoctoral research associate at Oak Ridge National Laboratory.
- Wan Luo (co-advised with R. Pelcovits), School of Engineering. Fluids and Thermal Processes group. Ph.D. June, 2023. Wan is currently a Product Engineer at Lam Research Corporation
- Federico Cao (co-advised with R. Pelcovits), School of Engineering, Fluids and Thermal Processes group. Ph. D. expected May, 2026.
- Zifei Liu (co-advised with R. Pelcovits), Department of Physics, Ph. D. expected May, 2026.
- Pranay Sampat (co-advised with R. Pelcovits), Department of Physics, Ph. D. expected May, 2026.
- I regularly serve as an examiner for graduate oral qualifying exams in the School of Engineering as well as a Ph. D. thesis committee member for students in engineering, applied mathematics, and physics.

b. Postdoctoral Associates

- 2006–2010: Henry Fu, Division of Engineering. Henry earned his Ph. D. in condensed-matter physics at the University of California, Berkeley. Henry is currently a professor in the Department of Mechanical Engineering at the University of Utah.
- 2010–2013: Bin Liu (co-advised with K. Breuer), School of Engineering. Bin has worked in fluid mechanics, applied mathematics, and physics at New York University, where he earned his Ph. D. and did his previous postdoctoral work. Bin is currently an associate professor in the School of Natural Sciences at the University of California, Merced.
- 2011–2013: Tatiana Kuriabova (co-advised with P. Vlahovska), School of Engineering. Tatiana earned her Ph. D. in condensed-matter physics at the University of California, Los Angeles, and did postdoctoral work in statistical physics and liquid crystals at the University of Colorado at Boulder. Tatiana is currently an associate professor in the Physics Department at Cal Poly San Luis Obispo.
- 2011–2012: Saverio Spagnolie, School of Engineering. Saverio earned his Ph. D. in applied mathematics at New York University, and did postdoctoral work in fluid me-

chanics and locomotion at the University of California, San Diego. Saverio is currently a professor at the University of Wisconsin-Madison in the Department of Mathematics.

- 2012–2014: Marcelo Dias, School of Engineering. Marcelo earned his Ph. D. in theoretical physics at the University of Massachusetts, Amherst, where he studied the elasticity and geometry of soft materials. Marcelo is Reader in Structural Engineering at the University of Edinburgh.
- 2015–2018: Harsh Soni (co-advised with R. Pelcovits), School of Engineering. Harsh earned his Ph. D. in theoretical physics at the Indian Institute of Science, Bangalore, where he studied the physics of active matter and non-equilibrium systems. He has also studied at the Tata Institute of Fundamental Research, Hyderabad. He is currently an assistant professor at the Indian Institute of Technology, Mandi.
- 2017–2018: Daniel Beller, School of Engineering. Dan earned his Ph. D. in theoretical physics at the University of Pennsylvania where he studied liquid crystal physics. Before coming to Brown he was a George Carrier Post-Doctoral Fellow at the School of Engineering and Applied Sciences at Harvard University. He is currently an assistant professor in the Department of Physics and Astronomy at Johns Hopkins University.
- 2019–2020: Guillaume Durey, School of Engineering (co-advised with K. Breuer). Guillaume earned his Ph. D. at Université PSL (Paris Science & Lettres) where he studied liquid crystal physics. He created the Lutetium Project, a YouTube science outreach channel. He is currently Solvay Online Content Developer and Student Camp Organizer at CERN.

c. Masters Theses

- 2018: Juan Shi, Fluids and Thermal Sciences group: *Swimming in an anisotropic fluid: how speed depends on angle.* Juan is currently pursuing a Ph. D. in mathematics at University of North Carolina, Chapel, Hill.
- 2020 Ajay Kumar (co-advised with Dan Harris): *Taylor-Aris dispersion with anisotropic particles.* Ajay is currently pursuing at Ph. D. in chemical engineering at Purdue University.
- 2023: Yutian He, Physics Department (co-advised with Bob Pelcovits). Yutian is currently pursuing a Ph. D. in physics at University of Massachusetts, Amherst.
- 2024: Gabriel Yerger, Physics Department (co-advised with Bob Pelcovits). Gabriel won the best Sc. M. Thesis award from the Physics Department in 2024. He is currently employed as a structural analysis engineer at Viking Systems International.

d. Honors Theses

- 2001: AnneMarie Van Parys, Mechanical Engineering '01; *Macroscopic model of flagellated bacterial swimming.* After graduation, Van Parys went to industry.
- 2003: James C. Bird, Mechanical Engineering '03 (co-advisor with K. Breuer) *Macroscale modeling and characterization of bacterial flagellar bundling.* After graduation, Jacy went to graduate school at James Cook University and then Harvard University. Jacy completed an NSF Postdoctoral Fellow in the Department of Mathematics at MIT and is currently an Associate Professor in the Department of Mechanical Engineering at Boston University.
- 2016: Kei Nishimura-Gasparian, Physics '16; *Stokes flow in a hexatic liquid crystal.*

e. Independent Studies and Summer Research Programs

- Nicola Costanzino, Applied Math (2001); MunJu Kim, Engineering (2001–2004), Elnaz Alipour-Assiabi, Physics (2002–2005); Srikanth Srigiriraju, Engineering (2002–2005); Tongsik Lee, Physics (2003)
- UTRA advisor for Jacy Bird, Mechanical Engineering '03 (2002).
- Advisor for Benjamin Herschenfeld, Physics '08, MRSEC REU program (2005)
- UTRA advisor for Steven Pei, Physics '19 (2017).

- Advisor for James Saslow, San Jose State University, Physics '22, Leadership Alliance Summer Research Early Identification Program (2020)
- Research advisor for Jasper Chen, Applied Mathematics and Physics '24.
- UTRA advisor for Raphael Benamran, Physics '25.

f. Undergraduate Advising

- Freshman advisor (2001, 2002, 2004, 2005, 2007, 2008, 2011–2014, 2015–2019, 2022–present)
- Sophomore advisor (2002, 2004, 2005, 2007–2009, 2012–2014, 2015–present)
- Concentration advisor for Mechanical Engineering, 2015–2020

University and Departmental Service

- Graduate Representative, Fluids and Thermal Sciences doctoral program, School of Engineering (Spring 2015–Fall 2019, Fall 2023)
- Graduate Representative, Masters in Mechanical Engineering and Applied Mechanics, School of Engineering (Fall 2023)
- Fluids and Thermal Sciences Group Representative on Engineering Executive Committee (AY 2022-23, AY 2023–24)
- Member, School of Engineering Target of Opportunity Committee (Fall 2022–Spring 2023)
- Member, School of Engineering ad hoc Target Committee (Spring 2022)
- Search Committee, Dean of Engineering (2021)
- Tenure, Promotions and Appointments Committee (July 1, 2019 to December 31, 2019; July 1, 2020 to June 30, 2022—the gap is due to sabbatical leave)
- Target of opportunity recruitment sub-committee chair, School of Engineering, Spring 2021
- Member, School of Engineering Target of Opportunity Committee (Fall 2017–Spring 2019)
- Search Committee, School of Engineering Fluids and Thermal Sciences faculty position (2018–2019; 2016–2017)
- Member of tenure or promotion committees [Engineering 2023–2024 (chair); Engineering 2022–2023; Engineering 2021–2022; Physics 2021–2022; Engineering 2018 (chair); Engineering 2017–2018; Engineering 2016–2017 (chair); Engineering 2013–2014; Engineering, 2012–2013; and Physics, 2014–2015]
- Ad-hoc Curriculum Committee, School of Engineering, (July 2016–December 2017)
- Contributor of Questions for PhD Physics Qualifying Exam (2014–2016, 2018, 2019, 2021–2023); member of physics comprehensive exam committees—2024 (2)
- Director of Graduate Programs, School of Engineering (2011–2014)
- 5-Year Integrated Masters' Program Advisor, School of Engineering (2011–2014)
- Solid Mechanics Group Representative on Engineering Executive Committee (Spring 2013)
- Search Committee, solid mechanics faculty position (2012–2013)
- Search Committee, biomedical engineering faculty position (2012–2013)
- Search Committee, neuroengineering biomedical engineering faculty position (2012–2013)
- Departmental Faculty Liaison to the Sheridan for Teaching and Learning (2010–2012)

- Research Advisory Board at the Office of Vice-President for Research (2008–2011)
- Search Committee, nanoengineering faculty position (2009–2010)
- Ad hoc committee on computing and life sciences in the undergraduate engineering core (2009)
- Committee on the Residential Experience (fall 2007–spring 2008)
- Graduate representative of the Division of Engineering for Biomedical Engineering (2004–2006; 2007–2009)
- Organizer of Biomedical Engineering Seminar Series, September 2000–December 2005
- Soft Materials Faculty Search Advisory Board (2003–2004)
- Committee on Prizes and Premiums, July 2001–June 2003.
- Search Committee, Fluids, Chemical, and Thermal Processes group faculty position (2002–2003)
- Obtained a *Women in Physics Travel Grant* from the American Physical Society to support travel costs of women speakers in the Condensed Matter Physics Seminar (2002).
- Co-organizer (with E. Chason) of Joint Mechanics and Materials Seminar, January 2002–December 2002
- Panelist, Sheridan Center Advanced Graduate Seminar, "Presenting Yourself in Writing: Cover Letters and CV's," (2002)
- Search Committee, Orthopaedics/Bioengineering faculty position (2001)
- Folder reader (engineering students) for admissions office (2000, 2003)

Professional Activities

- Life Member, American Physical Society.
- Life Member, American Physical Society Division of Soft Matter
- Visitor, Kavli Institute for Theoretical Physics, Active Solids: from Metamaterials to Biological Tissues, UCSB, December 2024.
- Panelist, National Science Foundation (2022; 2015; 2011; twice in 2010; 2007; 2006; 2005; 2003)
- Participant, Kavli Institute for Theoretical Physics, The Physics of Elastic Films: from Biological Membranes to Extreme Mechanics, UCSB (remote), May–June 2021.
- Visitor, Isaac Newton Institute for Mathematical Sciences, program on Growth, Form, and Self-Organization, University of Cambridge, fall 2017.
- Co-organizer (with Pelcovits, Stein, and Tang) of 2017 Tony and Pat Houghton Conference on Non-Equilibrium Statistical Mechanics held in May 2017 at Brown University
- Member of Local Organizing Committee for American Physical Society Division of Fluid Dynamics Meeting, Boston 2015
- General Member, Aspen Center for Physics, 2009–2014.
- American Physical Society Soft Matter Working Group, APS Headquarters, College Park, MD, November 2014.
- Corresponding Member, Journal Club for Condensed Matter Physics, 2009–2018 (`www.condmatjournalclub.org`).
- Participant, Aspen Center for Physics Summer Workshops: 2012, 2010, 2009, 2008, 2007, 2006, 2004, 1996, 1993.
- Co-organizer, Minisymposium "Hydrodynamics and microstructure: from single self-propelled particles to active soft matter," APS March Meeting, Boston, MA, (March 2012)

- Co-organizer, 2011 Aspen Center for Physics Winter School, "Physical microenvironments modulating biological interactions in the ocean" (January 2011).
- Ad hoc Divisional Associate Editor for *Physical Review Letters* (2010).
- Co-organizer, Minisymposium "Complex material properties in biological locomotion," *SIAM Conference on Mathematical Aspects of Materials Science*, Philadelphia, PA (May 2010)
- Panelist, National Cancer Institute, Physical Science-Oncology Centers (June 2009).
- Co-organizer of Aspen Center for Physics Summer Workshop, "Notions of Locomotion (June 2007).
- Co-organizer, 2007 NSF Nanoscience Summer School, Caltech.
- Co-organizer, Boulder School for Condensed-Matter and Materials Physics 2006 Summer School, "Physics of Soft Matter: Complex Fluids and Biological Materials."
- Co-organizer, Minisymposium "Materials Geometry," *SIAM Annual Meeting*, New Orleans, LA, (July 2005)
- Co-organizer, Aspen Center for Physics Summer Workshop,"Geometry and Materials Physics," Aspen, CO, (June 2004)
- Panelist, NSF Workshop "The Role of Theory in Biological Physics and Materials," Tempe, AZ. (May 2004).
- Co-organizer, *18th New England Workshop on Complex Fluids*, held at Brown University, 3/19/04
- Organizer, Symposium "Molecular and Cellular Biomechanics," *Society of Engineering Science Meeting*, Ann Arbor, MI, (October 2003)
- Organizer and chair, Minisymposium "Geometry in Soft Matter and Biological Physics," *SIAM 50th Anniversary and Annual Meeting*, Philadelphia, PA, (July 2002)
- Co-organizer, *7th New England Workshop on Complex Fluids*, held at Brown University, 6/15/01
- Organizer and chair, Minisymposium "Propulsion at low Reynolds number," *6th SIAM Conference on Applications of Dynamical Systems*, Snowbird, UT, (May 2001)
- I often referee for *Physical Review E*, *Physical Review Letters*, *Physical Review Fluids*, *Proceedings of the National Academy of Science USA*, and *Soft Matter*.
- I have also served as a referee for *Biophysical Chemistry*, *Biophysical Journal*, Cambridge University Press, *Current Biology*, *European Journal of Applied Mathematics*, *European Physical Journal E*, *Europhysics Letters*, *Fluid Dynamics Research*, Garland Science, Israel Science Foundation, *Journal of Applied Mechanics*, *Journal of Chemical Physics*, *Journal of Elasticity*, *The Journal of Experimental Biology*, *Journal of Fluid Mechanics*, *Journal of Mathematical Biology*, *Journal of Mechanics and Physics of Solids*, *Journal of Physics Communications*, *Journal of the Royal Society Interface*, *Mathematical & Computer Modelling*, Nanyang Technological University (Singapore) Academic Research Fund, National Science Foundation, *Nature Communications*, *New Journal of Physics*, Oxford Centre for Collaborative Applied Mathematics, *Physical Biology*, *Physics of Fluids*, *Physical Review X*, *Proceedings of the Royal Society*, *Reviews of Modern Physics*, *Science*, *Scientific Reports*, WH Freeman & Co, and the Wellcome Trust/DBT India Alliance.