CURRICULUM VITAE

1. Robert A. Pelcovits

Professor, Department of Physics

2. Education

1974 B.A. (Physics), M. S. (Physics), University of Pennsylvania
1978 Ph.D. (Physics), Harvard University

3. Professional Experience

1977 Summer Faculty Fellow, IBM Watson Research Center
1978-79 Research Associate, University of Illinois at Urbana-Champaign
1979-80 Research Associate, Brookhaven National Laboratory
1979 Scientific Consultant, IBM Watson Research Center
1979-86 Assistant Professor of Physics, Brown University
1983 Visiting Assistant Professor, Tel-Aviv University
1983 Visiting Scientist, NORDITA, Copenhagen, Denmark
1983 Visiting Scientist, Service de Physique Theorique, Saclay, France
1983-85 Visiting Scientist, Weizmann Institute of Science
1984-85 Visiting Scientist, Tel-Aviv University
1986-93 Associate Professor of Physics, Brown University
1987 Visiting Scientist, Brandeis University
1993- Professor of Physics, Brown University
1994 Visiting Scientist, Brandeis University
2001-04 Visiting Scientist, Brandeis University
2008-14 Visiting Scientist, Brandeis University
2008-11 Royce Family Professor in Teaching Excellence, Brown University
2013 Visiting Fellow, Isaac Newton Institute for Mathematical Sciences

4. Completed Research

- Book chapters

1. "Theory and Computation," in *Handbook of Liquid Crystals*, (Collings and Patel, eds.), Oxford U. Press, 1996.

2. "Tensor Visualization and Defect Detection for Nematic Liquid Crystals using Shape Characteristics," (T. J. Jankun-Kelly, Song Zhang, A. C. Callan-Jones, R. A. Pelcovits, V. A. Slavin and D. H. Laidlaw), in *Visualization and Processing of Tensor Fields",* (Laidlaw and Weickert, eds.), Springer, 2009.

- Refereed journal articles

1. "Bicritical Points in 2+ε Dimensions," (D. R. Nelson and R. A. Pelcovits), Phys. Letts. **57**A, 23 (1976).

2. "Theory of Bicritical Points in 2+ε Dimensions," (R. A. Pelcovits and D. R. Nelson), AIP Conf. Proc. **34**, 381 (1976).

3. "Momentum-Shell Recursion Relations, Anisotropic Spins, and Liquid Crystals in 2+ε Dimensions," (D. R. Nelson and R. A. Pelcovits), Phys. Rev. B **16**, 2191 (1977).

4. "Spin-Glass and Ferromagnetic Behavior Induced by Random Uniaxial Anisotropy," (R. A. Pelcovits, E. Pytte and J. Rudnick), Phys. Rev. Lett. **40**, 476 (1978).

5. "Two Dimensional Ferroelectric Liquid Crystals," (R. A. Pelcovits and B. I. Halperin), J. Appl. Phys. **50**, 1796 (1979).

6. "Low Temperature Renormalization Group Study of the Random-Axis Model," (R. A. Pelcovits), Phys. Rev. B **19**, 465 (1979).

7. "Two-Dimensional Ferroelectric Liquid Crystals," (R. A. Pelcovits and B. I. Halperin), Phys. Rev. B **19**, 4614 (1979).

8. "Spin-Spin Correlation Function in the High Temperature Villain Model,", (R. A. Pelcovits), J. Phys. A **14**, 1693 (1981).

9. "Anharmonic Effects in Bulk Smectic Liquid Crystals and Other `One-Dimensional Solids'," (G. Grinstein and R. A. Pelcovits), Phys. Rev. Lett. **47**, 856 (1981).

10. "Nonlinear Elastic Theory of Smectic Liquid Crystals," (G. Grinstein and R. A. Pelcovits), Phys. Rev. A **26**, 915 (1982).

11. "Smectic C-A Transition in Three Dimensions," (G. Grinstein and R. A. Pelcovits), Phys. Rev. A **26**, 2196 (1982).

12. "Anharmonic Effects and Gauge Transformations in Smectic Liquid Crystals," (T. C. Lubensky, G. Grinstein and R. A. Pelcovits), Phys. Rev. B **25**, 6022 (1982).

13. "Nonuniform Long-Range Order in Certain Random Systems," (R. A. Pelcovits and J. M. Kosterlitz), J. Phys. A **16**, L763 (1983).

14. "Exact Solution of a One-Dimensional XY Model in a Random Field," (R. A. Pelcovits and D. Mukamel), Phys. Rev. (RC) B **28**, 5374 (1983).

15. "The Smectic C*-Smectic A Transition in Variable Thickness Liquid Crystals Films," (S. Heinekamp, R. A. Pelcovits, E. Fontes, E. Chen, R. Pindak and R. B. Meyer), Phys. Rev. Lett. **52**, 1017(1984).

16. "Lower Bounds for the Width of Domain Walls in the Random Field Ising Model," (B. J. Minchau and R. A. Pelcovits), Phys. Rev. B **29**, 6059 (1984).

17. "Dynamics of Charge Density Waves Pinned by Impurities," (D. Mukamel and R. A. Pelcovits), Phys. Rev. (RC) B **29**, 5972 (1984).

18. "Glauber Dynamics for One-Dimensional Spin Models with Random Fields," (G. Forgacs, D. Mukamel and R. A. Pelcovits), Phys. Rev. B **30**, 205 (1984).

19. "Structure Factor for Dilute Magnetic Systems," (R. A. Pelcovits and A. Aharony), Phys. Rev. B **31**, 350 (1985).

20. "Spin Correlation Function for the Two-Dimensional XY Model," (S. Heinekamp and R. A. Pelcovits), Phys. Rev. B **32**, 4528 (1985).

21. "Two-Dimensional XY Model in a Uniaxial Random Field," (B. J. Minchau and R. A. Pelcovits), Phys. Rev. B **32**, 3081 (1985).

22. "Dynamics of the Smectic C-A Transition in Freely Suspended Thin Films," (S. Heinekamp and R. A. Pelcovits), Phys. Rev. A **32**, 2506 (1985).

23. "Linear Elasticity Theory for Pentagonal Quasicrystals," (P. De and R. A. Pelcovits), Phys. Rev. B **35**, 8609 (1987).

24. "Disclinations in Pentagonal Quasicrystals," (P. De and R. A. Pelcovits), Phys. Rev. (RC) B **37**, 9304 (1987).

25. "Modulated Phases in Thin Ferroelectric Liquid-Crystal Films," (G. A. Hinshaw, R. G. Petschek and R. A. Pelcovits), Phys. Rev. Lett. **60**, 1864 (1988).

26. "Interaction Energy of Disclinations in Pentagonal Quasicrystals," (P. De and R. A. Pelcovits), Phys. Rev. B **38**, 5042 (1988).

27. "Melting of Pentagonal Quasicrystals," (P. De and R. A. Pelcovits), J. Phys. A **22**, 1167 (1989).

28. "Flux Lattice Melting in High-T_c Superconductors," (A. Houghton, R. A. Pelcovits and A. Sudbø), Phys. Rev. B **40**, 6763 (1989). Work profiled in *The Scientist*, March 1991.

29. "Elastic Modes, Phase Fluctuations and Long-Range Order in Type II Superconductors," (A. Houghton, R. A. Pelcovits and A. Sudbø), Phys. Rev. B **42**, 906 (1990).

30. "Nonlinear Elasticity Theory of Polymeric Liquid Crystals," (W. S. Lo and R. A. Pelcovits), Phys. Rev. A **42**, 4756 (1990).

31. "Ising Model in a Time-Dependent Magnetic Field," (W. S. Lo and R. A. Pelcovits), Phys. Rev. A **42**, 7471 (1990).

32. "Dynamical Behavior of Thin Ferroelectric Liquid Crystal Films in AC Electric Fields," (W. S. Lo, R. A. Pelcovits, R. Pindak and G. Srajer), Phys. Rev. A **42**, 3630 (1990).

33. "Translational and Orientational Order of the Flux Line Lattice of a High T_c Superconductor," (A. Houghton, R. A. Pelcovits and A. Sudbø), J. Phys. Cond. Mat. **3**, 7527 (1991).

34. "Dynamics and Thermal Fluctuations in High T_c Superconductors," (G. Vecris and R. A. Pelcovits), Phys. Rev. B **44**, 2767 (1991).

35. "Effects of Random Fields on Bicritical Phase Diagrams in Two and Three Dimensions," (R. J. Birgeneau, A. Aharony, R. A. Cowley, J. P. Hill, R. A. Pelcovits, G. Shirane and T. R. Thurston), Physica **177**, 58 (1991).

36. "The Supercooling of a Nematic Liquid Crystal," (P. De, R. A. Pelcovits, E. Vogel and J. Vogel), Phys. Rev. E **47**, 1824 (1993).

37. "The Bicritical Phase Diagram of Two-Dimensional Antiferromagnets with and without Random Fields," (R. A. Cowley, A. Aharony, R. J. Birgeneau, R. A. Pelcovits, G. Shirane and T. R. Thurston), Z. Phys. B **93**, 5 (1993).

38. "Piezoelectricity of Cholesteric Elastomers," (R. A. Pelcovits and R. B. Meyer) J. de Phys. II **5**, 877 (1995).

39. "Viscosities of the Gay-Berne Nematic Liquid Crystal," (A. M. Smondyrev, R. A. Pelcovits, and G. B. Loriot), Phys. Rev. Lett. **75**, 2340 (1995).

40. "Cholesteric Pitch of Rigid and Semiflexible Chiral Liquid Crystals," (R. A. Pelcovits) Liq. Cryst. **21**, 361 (1996).

41. "Glass Formation in the Gay-Berne Nematic Liquid Crystal," (A. M. Smondyrev and R. A. Pelcovits), Liq. Cryst. **23**, 205 (1997).

42. "Simulations of Liquid Crystals," (J. Billeter and R. A. Pelcovits), invited article, Computers in Physics, **12**, 440 (1998).

43. "Nematic Structures in Cylindrical Cavities," (A. M. Smondyrev and R. A. Pelcovits), Liq. Cryst. **26**, 235 (1999).

44. "Phase-Ordering Dynamics of the Gay-Berne Nematic Liquid Crystal," (J. Billeter, A. M. Smondyrev, G. B. Loriot and R. A. Pelcovits), Phys. Rev. E **60**, 6831 (1999).

45. "Molecular Shape and Flexoelectricity," (J. Billeter and R. A. Pelcovits), Liq. Cryst. **27**, 1151 (2000).

46. "Defect Configurations and Dynamical Behavior in a Gay-Berne Nematic Emulsion," (J. Billeter and R. A. Pelcovits), Phys. Rev. E **62**, 711 (2000).

47. "Surface Extrapolation Length and Director Structures in Confined Nematics," (N. Priezjev and R. A. Pelcovits), Phys. Rev. E **62**, 6734 (2000).

48. "Cluster Monte Carlo Simulations of the Nematic-Isotropic Transition," (N. Priezjev and R. A. Pelcovits), Phys. Rev. E **63,** 062702 (2001).

49. "Disclination Loop Behavior near the Nematic-Isotropic Transition," (N. Priezjev and R. A. Pelcovits), Phys. Rev. E **64,** 031710 (2001).

50. "Topological Defect Behavior in a Quenched Nematic Liquid Crystal," (R. A. Pelcovits, J. L. Billeter, A. M. Smondyrev and G. B. Loriot), in *Defects in Liquid Crystals: Computer Simulations, Theory and Experiments*, O. D. Lavrentovich, P. Pasini, C. Zannoni, and S. Zumer, eds., Kluwer, Dordrecht, 2001.

51. "The Electroclinic Effect and Modulated Phases in Smectic Liquid Crystals," (R. B. Meyer and R. A. Pelcovits), Phys. Rev. E **65,** 061704 (2002).

52. "The Isotropic-Cholesteric Transition in Liquid-Crystalline Gels," (R. A. Pelcovits and R. B. Meyer), Phys. Rev. E **66,** 031706 (2002).

53. "Virtual Surfaces, Director Domains and the Fréedericksz Transition in Polymer Stabilized Nematic Liquid Crystals," (P. A. Kossyrev, J. Qi, N. Priezjev, R. A. Pelcovits and G. P. Crawford), Appl. Phys. Lett. **81,** 2986 (2002).

54. "Coarsening Dynamics of Biaxial Nematic Liquid Crystals," (N. Priezjev and R. A. Pelcovits), Phys. Rev. E **66,** 051705 (2002).

55. "Modeling Electro-Optic Performance in Polymer Stabilized Nematic Liquid Crystal Display Configurations," (P. A. Kossyrev, J. Qi, N. Priezjev, R. A. Pelcovits and G. P. Crawford), *Proceedings of Asia Display* **7**, 371 (2002).

56. "Model of Fredericks Transition and Hysteresis Effect in Polymer Stabilized Nematic Liquid Crystal Configurations for Display Applications," (P. A. Kossyrev, J. Qi, N. Priezjev, R. A. Pelcovits and G. P. Crawford), *Digest for the Society for Information Display* **XXXIII**, 506 (2002).

57. "Optical and Mechanical Properties of Stretched PDLC Films for Scattering Polarizers," (I. Amimori, J. N. Eakin, N. V. Priezjev, R. A. Pelcovits and G. P. Crawford), *Digest for the Society for Information Display* **XXXIII**, 834 (2002).

58. "External and intrinsic anchoring in nematic liquid crystals: A Monte Carlo study," (N. V. Priezjev, G. Skacej, R. A. Pelcovits and S. Zumer), Phys. Rev. E. **68,** 041709 (2003).

59. "Optomechanical Properties of Stretched Polymer Dispersed Liquid Crystal Films for Scattering Polarizer Applications," (I. Amimori, N. V. Priezjev, R. A. Pelcovits and G. P. Crawford), J. Appl. Phys. **93,** 3248 (2003).

60. "Zero voltage Freedericksz transition in periodically aligned liquid crystals," (J. N. Eakin, Y. Xie, R. A. Pelcovits, M. D. Radcliffe, and G. P. Crawford, Appl. Phys. Lett. **85,** 1671 (2004)

61. "Liquid crystals in random porous media: Disorder is stronger in low-density aerosols," (D. E. Feldman and R. A. Pelcovits), Phys. Rev. E (RC) **70,** 040702 (2004).

62. "Visualization of Topological Defects in Nematic Liquid Crystals Using Streamtubes, Streamsurfaces and Ellipsoids," (V. A. Slavin, D. Laidlaw, R. A. Pelcovits, G. Loriot, S. Zhang, and A. Callan-Jones), IEEE Transactions on Visualization and Computer

Graphics (Proceedings Visualization / Information Visualization 2004), p. 598.21 (2004).

63. "Polarization holographic patterned alignment of nematic liquid crystals," (J. N. Eakin, R. A. Pelcovits, G. P. Crawford and M. D. Radcliffe), Mol. Cryst. Liq. Cryst. **438,** 185 (2005).

64. "Liquid Crystal Diffraction Gratings Using Polarization Holography Alignment Techniques," (G. P. Crawford, J. N. Eakin, M. D. Radcliffe, A. Callan-Jones and R. A. Pelcovits), J. Appl. Phys. **98,** 123102 (2005).

65. "Stable Polarization Gratings Recorded in Azo Dye Doped Liquid Crystals," (S. P. Gorkhali, S. G. Cloutier, G. P. Crawford and R. A. Pelcovits), Appl. Phys. Lett. **88,** 251113 (2006).

66. "Techniques for the Visualization of Topological Defect Behavior in Nematic Liquid Crystals," (V. A. Slavin, R. A. Pelcovits , G. Loriot, A. Callan-Jones and D. H. Laidlaw), IEEE Transactions on Visualization and Computer Graphics (Proceedings Visualization / Information Visualization 2006), **12,** 1323 (2006).

67. "Simulation and visualization of topological defects in nematic liquid crystals," (A. Callan-Jones, R. A. Pelcovits, G. B. Loriot, V. Slavin, S. Zhang, and D. H. Laidlaw), Phys. Rev. E. **74,** 061701 (2006).

68. "Unwinding of a strained cholesteric elastomer by disclination loop nucleation," (A. Callan-Jones, R. A. Pelcovits, R. B. Meyer, and A. F. Bower), Phys. Rev. E. **75,** 011701 (2007).

69. "Role of electrostatics in the texture of islands in free-standing ferroelectric liquid crystal films," (J.-B. Lee, R. A. Pelcovits and R. B. Meyer), Phys. Rev. E. **75,** 051701(2007).

70. "Dynamics of the molecular orientation field coupled to ions in two-dimensional ferroelectric liquid crystals," (R. A. Pelcovits, R. B. Meyer and J.-B. Lee), Phys. Rev. E. **76,** 021704 (2007).

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

72. "Nematic cells with defect-patterned alignment layers," (A. S. Backer, A. C. Callan-Jones and R. A. Pelcovits), Phys. Rev. E **77,** 021701 (2008).

73. "Direct measurement of the twist penetration length in a single smectic A layer of colloidal virus particles," (E. Barry, Z. Dogic, R. B. Meyer, R. A. Pelcovits and R. Oldenbourg), invited article, J. Phys. Chem. B **113,** 3910 (2009).

74. "Nematic cells with quasicrystalline-patterned alignment layers," (M. H. Schwarz and R. A. Pelcovits), Phys. Rev. E **79,** 022701 (2009).

75. "Twist penetration in single layer smectic A disks of colloidal virus particles," (R. A. Pelcovits and R. B. Meyer), (invited article), Liq. Cryst. **36,** 1157 (2009).

76. "Theory of depletion-induced phase transition from chiral smectic-A twisted ribbons to semi-infinite flat membranes," (C. N. Kaplan, H. Tu, R. A. Pelcovits and R. B. Meyer), Phys. Rev. E **82,** 021701 (2010)

77. "Theory of self-assembled smectic-A crenellated disks: Membranes with cusped edges," (H. Tu and R. A. Pelcovits), Phys. Rev. E **87,** 032504 (2013).

78. "Instability of flat disks with respect to the formation of twisted ribbons in smectic-A monolayers," (H. Tu and R. A. Pelcovits), Phys. Rev. E **87,** 042505 (2013).

79. "Creating arbitrary arrays of two dimensional topological defects," (B. S. Murray, R. A. Pelcovits and C. Rosenblatt), Phys. Rev. E **90,** 052501 (2014).

80. "Interaction of chiral rafts in self-assembled colloidal membranes," (S. Xie, R. A. Pelcovits and M. F. Hagan), Phys. Rev. E **90,** 032706 (2016).

81. "Probing a self-assembled *fd* virus membrane with a microtubule," (S. Xie, R. A. Pelcovits and M. F. Hagan), Phys. Rev. E **93,** 062608 (2016).

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

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

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

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

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

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

88. "Shapes of fluid membranes with chiral edges," (L. Ding, R. A. Pelcovits and T. R. Powers), Phys. Rev. E **102,** 032608 (2020).

89. "Deformation and orientational order of chiral membranes with free edges," (L. Ding, R. A. Pelcovits and T. R. Powers), Soft Matter **17,** 6580 (2021).

90. “Axisymmetric membranes with edges under external force: buckling, minimal surfaces, and tethers,” (L. L. Jia, S. Pei, R. A. Pelcovits and T. R. Powers), Soft Matter **17,** 7268 (2021).

91. “Controlling the shape and topology of two-component colloidal membranes,” (A. Khanra, L. L. Jia, N. P. Mitchell, A. Balchunas, R. A. Pelcovits, T. R. Powers, Z. Dogic and P. Sharma), PNAS **119,** e2204453119 (2022).

92. “Chiral fluid membranes with orientational order and multiple edges,” (L. Ding, R. A. Pelcovits and T. R. Powers), Soft Matter **19,** 8453 (2023).

93. “Flow states of two dimensional active gels driven by external shear,” (W. Luo, A. Baskaran, R. A. Pelcovits and T. R. Powers), Soft Matter **20,** 738 (2024).

94. “Topology and kinetic pathways of colloidosome assembly and disassembly,” (R. Adkins, J. Robaszewski, S. Shin, F. Brauns, L. Jia, A. Khanra, P. Sharma, R. Pelcovits, T. R. Powers and Z. Dogic), PNAS **122,** e2427024122 (2025).

95. “Competition of elasticity and alignment determine how chiral membranes respond to curvature,” (C. Joshi, Z. Liu, P. M. Navarro, T. R. Powers, R. A. Pelcovits and T. Atherton), Soft Matter **22,** 411 (2026).

96. “Interfacial instability of confined 3D active droplets,” (B. C. Sessa, F. Cao, R. A. Pelcovits, T. R. Powers and G. Duclos), Physical Review Research **8,** 013120 (2026).

97. “Geometry-dependent transmission of externally imposed shear stress in confined microtubule-kinesin active fluids,” (J. H. Dickie, T. Weng, Y-C Chen, H. Wang, Y. He, S. Saxena, R. A. Pelcovits, T. R. Powers and K-T Wu), Soft Matter **22,** 1933 (2026).

98. “Mechanical instability generates monodisperse colloidosomes,” (S. Shin, F. Cao, R. A. Pelcovits, T. R. Powers and Z. Dogic), arXiv:2511.06588, submitted to Science Advances.

99. “Brownian dynamics simulations of inclusions in an active fluid bath,” (L. Ding, R. A. Pelcovits and T. R. Powers), arXiv:2505.09744, submitted to Soft Matter.

100. “On the Criticality of One-Dimensional Ising Model with Inverse-Squared Interactions,” (O. Tower, A. Gassamal, L. Ding, J. Eick, J. Tobochnik, R. A. Pelcovits, J. M. Kosterlitz and X. S. Ling), submitted to Physical Review E.

- Book Reviews

1. “Polymers, Liquid Crystals, and Low-Dimensional Solids,” (N. March and M. Tosi, eds.), Mat. Sci. Eng. **85**, 191 (1987).

2. “Fundamentals of Statistical Mechanics,” (J. D. Walecka, ed.), and “Equilibrium Statistical Physics” (by Plischke and Bergersen), Physics Today **43**, 69 (1990).

3. "The Physics of Liquid Crystals," (by J. Prost and P. G. de Gennes), Physics Today **48**, 70 (1995).

4. "Statistical Mechanics Made Simple," (by D. C. Mattis), Am. J. Phys. **72,** 846 (2004)

- Contributed Presentations

1. "Tilt Angle Measurements at the Chiral Smectic C-Smectic A Phase Transition in Freely Suspended Liquid Crystal Films," (with R. Pindak and R.B. Meyer), Bull. Am. Phys. Soc. **23**, 353 (1978).
2. "Smectic C-A Transition in Three Dimensions," (with G. Grinstein), Bull. Am. Phys. Soc. **26**, 304 (1981).
3. "Tilt Angle Behavior at the Chiral Smectic C-Smectic A Phase Transition in Freely Suspended Liquid Crystal Films," (with S. Heinekamp, E. Fontes, and R. Pindak), Bull. Am. Phys. Soc. **27**, 327 (1982).
4. "Lower Bounds for the Width of Domain Walls in the Random Field Ising Model," (with B. J. Minchau), Bull. Am. Phys. Soc. **29**, 398 (1984).
5. "Ising Order in the Two-Dimensional XY Model with a Random Uniaxial Field," (with B. J. Minchau), Bull. Am. Phys. Soc. **30**, 376 (1985).
6. "The Melting of Two-Dimensional Quasicrystals," (with P. De), Bull. Am. Phys. Soc. **31**, 540 (1986).
7. "Linear Elasticity Theory of Pentagonal Quasicrystals," (with P. De), Bull. Am. Phys. Soc. **32**, 558 (1987).
8. "Electrohydrodynamic Instability in Smectic-C* Liquid Crystal Films," (with W. S. Lo, G. Srajer, and R. Pindak), Bull. Am. Phys. Soc. **34**, 569 (1989).
9. "A Hydrodynamic Description of the Glass Transition in a Nematic Liquid Crystal," (with P. De, E. Vogel and J. Vogel), Bull. Am. Phys. Soc. **34**, 653 (1989).
10. "Surface Extrapolation Length and Director Structures in Confined Nematics," (with N. Priezjev), Bull. Am. Phys. Soc. **46,** 1027 (2001).
11. "Disclination Loop Behavior near the Nematic-Isotropic Transition," (with N. Priezjev), Bull. Am. Phys. Soc. **47,** 868 (2002).
12. "Coarsening Dynamics of Biaxial Nematics," (with N. Priezjev), Bull. Am. Phys. Soc. **47,** 939 (2002).
13. "Liquid crystals in random porous media: Disorder is stronger in low-density aerosols," (with D. E. Feldman), American Physical Society Meeting, March 21-25, 2005, Los Angeles
14. "Theory of Depletion Induced Phase Transition from Chiral Smectic A Twisted Ribbons to Semi–infinite Flat Membranes," (with C.N. Kaplan, H. Tu and R. B. Meyer), Fall Meeting of the Materials Research Society, Boston, December 2010.
15. "Creating Arbitrary Arrays of Arbitrary Topological Defects," (with B. Murray and C. Rosenblatt), International Liquid Crystal Conference, Dublin, Ireland, June 29-July 4, 2014.
16. "Modeling the Enhancement of the Swimming Speed of Flagellated Bacteria in Polymer Solutions," (with J. X. Tang, X. Zhang, F. Ye and W. Klimpert), American Physical Society Meeting, March 13-17, 2017, New Orleans
17. "Force vs Separation for Axisymmetric Nearly Minimal Surfaces," (with T. R. Powers, S. Pei and L. Jia), American Physical Society Meeting, March 5-9, 2018, Los Angeles
18. "Enhanced Microorganism Swimming in Active Matter," (with H. Soni and T. R. Powers), American Physical Society Meeting, March 5-9, 2018, Los Angeles

19. "3D Axisymmetric Shapes for Colloidal Membranes," (with A. Balchunas, L. Jia, P. Sharma, Z. Dogic and T. R. Powers), American Physical Society Meeting, March 5-9, 2018, Los Angeles
20. "Axisymmetric Membranes under External Force," (with T. Powers, L. Jia and S. Pei), American Physical Society, Division of Fluid Dynamics, Atlanta, GA
21. "Stability of interfaces in active fluids," (with H. Soni. W. Luo and T. R. Powers), American Physical Society Meeting, March 4-8, 2019, Boston.
22. "Closed vesicle formation through the spontaneous curvature of flat colloidal membranes," (with R. Adkins, Z. Dogic, L. Jia, T. Powers and Y. Yang), American Physical Society Meeting, March 14-18, 2022, Chicago.
23. "Lattice Boltzmann Simulations of Active Liquid Crystals Under Confinement," (with S. Saxena and T. Powers), American Physical Society Meeting, March 14-18, 2022, Chicago.
24. "Three-dimensional structures of chiral membrane with free edges," (with L. Ding and T. Powers), American Physical Society Meeting, March 14-18, 2022, Chicago.
25. "Spontaneous rotation of disks by active nematics," (with P. Sampat and T. R. Powers), American Physical Society, Division of Fluid Mechanics, November 19-21, 2023, Washington DC.
26. "Boundary element method for membranes," (with F. Cao and T. R. Powers), American Physical Society, Division of Fluid Mechanics, November 19-21, 2023, Washington DC.
27. "Poiseuille flow of an active gel in a cylindrical tube," (with W. Luo, A. Baskaran and T. R. Powers), American Physical Society, Division of Fluid Mechanics, November 19-21, 2023, Washington DC.
28. "Instability of an active droplet in a Hele-Shaw geometry," (with F. Cao, B. Sessa, G. Duclos and T. R. Powers), American Physical Society, Division of Fluid Mechanics, November 24 – 26, 2024, Salt Lake City, Utah.
29. "Self-assembly of closed vesicles," (with F. Cao, S. Shin, Z. Dogic and T. R. Powers), American Physical Society, Division of Fluid Mechanics, November 22 – 24, 2025, Houston, Texas.

5. Service

- University (since 2020)

2019-20	Sophomore advisor (4 students)
2019-20	Member, Physics Department Publicity and Outreach Committee
2019-20	Physics Department Honors Coordinator
2019-20	Physics Department Graduate Advisor
2019-20	Member, L. N. Cooper Postdoctoral Search Committee
2020	Member, TPAC (one semester sabbatical replacement)
2020	Reviewer for Brown's Research Achievement Awards, OVPR
2020	Member, UTRA Review Committee
2020	Member, Ad Hoc Office of Research Integrity Committee, OVPR
2020-21	Member, Ad Hoc "Covid-19 and Faculty Advancement" Committee
2020-23	Member, University Resources Committee
2020	Member, Goldwater Scholarship Selection Committee
2022-23	Chair, Physics Department Graduate Advisors Committee
2022-24	Physics Department Concentration Advisor

2023-24	Physics Department Honors Coordinator
2023-24	First-year advisor (6 students)
2024-25	Sophomore advisor (6 students)
2025-26	Physics Concentration Advisor
2025-26	Chair, Physics Department Master's Advisers
2026-27	Physics Master's Adviser
2025-27	Physics Department Honors Coordinator
2025-27	Physics Department Curriculum Committee

6. Honors and Awards

1982-83	Bergmann Memorial Award for Young Scientists, U.S.-Israel Binational Science Foundation
1983	Einstein Fellow, Einstein Center for Theoretical Physics, Weizmann Institute of Science
1983-87	Alfred P. Sloan Foundation Fellow
1999	Philip J. Bray Award for Teaching Excellence in the Physical Sciences
1999	Certificate of Appreciation for Excellence in Teaching, Onyx Class of 1999
2001	Certificate of Appreciation, Brown Chapter of the National Society of Black Engineers
2002	Mellon Minority Undergraduate Fellowship Outstanding Mentor Book Research Award
2008-11	Royce Family Professor in Teaching Excellence
2009	President's Award for Excellence in Faculty Governance
2011	Harriet Sheridan Award for Distinguished Contribution to Teaching and Learning
2012	American Physical Society Outstanding Referee Award

7. Research Grants

Title	Start	End	Amount
National Science Foundation			
Critical Phenomena in Thin Films, Amorphous Systems and Metals	7/1/80	12/31/83	$78,100
Theoretical Studies of the Liquid - Solid Helium Interface and Amorphous Magnets	7/1/83	12/31/86	$123,000
Theoretical Studies of Polymeric Liquid Crystals, Thin Liquid Crystal Films, and Quasicrystals	7/1/86	3/31/90	$151,700
Non-Equilibrium Phenomena in Nematic Liquid Crystals	2/15/93	7/31/96	$195,000
Numerical Simulations of Nematic Liquid Crystals	2/1/96	1/31/00	$195,000
Large-Scale Simulations of Liquid Crystals	2/1/99	9/30/02	$258,000
Numerical Simulations of Topological Defects in Liquid Crystals	2/1/02	12/31/05	$294,000
Constraints and Frustration in Nano-structured and Biomolecular Materials (Brandeis MRSEC subcontract)	9/1/08	8/31/14	$359,071
Motion of Uni-flagellated Bacteria in Viscoelastic Media (co-PI; PI: Jay Tang)	9/1/14	8/31/17	$361,630
Mechanics of Colloidal Membranes (co-PI; PI: Tom Powers)	9/1/16	8/31/20	$376,949
Shape and Deformation of Colloidal Membranes (co-PI; PI: Tom Powers)	9/1/20	8/31/23	$383,463
Active Fluids in Externally Driven Flows (co-PI; PI: Tom Powers)	9/1/22	8/31/25	$426,765
Petroleum Research Foundation			
Dynamic Anchoring of Liquid Crystals at Fluid Interfaces	9/1/08	8/31/12	$100,000

8. Teaching (past three calendar years)

2022-26 Supervision of Ph.D. thesis, Pranay Sampat (joint with Tom Powers)
2022-26 Supervision of Ph.D. thesis, Zifei Liu (joint with Tom Powers)
2024 Supervision of Sc.M. thesis, Gabriel Yerger (joint with Tom Powers)
2024 Supervision of Sc.B. thesis, Dmitrios Papadimitriou
2024 PHYS 1420, Quantum Mechanics B, 22 students
2024 PHYS 470, Electricity and Magnetism, 74 students
2025 PHYS 2050, Quantum Mechanics, 46 students
2026 PHYS 160, Introduction to Relativity, Waves and Quantum Physics, 76 students
2026 PHYS 1410, Quantum Mechanics A, XXXXXX students
2026 Supervision of Sc.M. thesis, L. Brooke Turner, (joint with Tom Powers)

9. Vita prepared December 15, 2026.