

Biographical Sketch: Michael F. Hagan

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(i) Professional Preparation

University of Connecticut, Storrs Chemical Engineering B.S.E. (summa cum laude), 1998.

University of California, Berkeley Chemical Engineering Ph. D., 2003
Advisor: Arup K. Chakraborty

University of California, Berkeley Chemistry Postdoctoral, 2003-2006
Advisor: David Chandler

(ii) Appointments

Chair, Biological Physics Program	Brandeis University	7/2013 - present
Professor of Physics	Brandeis University	5/2018 - present
Associate Professor	Brandeis University	1/2013 - 4/2018
Assistant Professor	Brandeis University	1/2007-12/2012
NIH Ruth L. Kirchstein Postdoctoral Fellow	University of California, Berkeley	2004-2006
Postdoctoral Researcher	University of California, Berkeley	2003

(iii) Research Support

- National Institutes of Health NIGMS (Award No. R01GM108021)

Computational modeling of viral capsid and bacterial microcompartment assembly

Total Costs: \$1,290,100 (1 PI, role=PI) *December 2008 – May 2022*

- National Science Foundation (DMR)

Computational and Theoretical Modeling of Active Nematics in 3D and Under Confinement

Total Costs \$396,000 (1 PI, role =PI) *August 2019 – July 2022*

- National Science Foundation (IOS, Award number IOS-1526941)

Memory storage by variable-size stable structures

(Currently in no-cost extension)

Total Costs \$1,000,000 (2 PI's, role =PI) *August 2015 – July 2018*

- Innovative Inquiry Award (Brandeis University)

Artificial intelligence approach to understand virus capsid assembly and improve antiviral drugs

Total Costs \$34,980 (2 PI, role =PI) *July 2019 – June 2020*

Recent Research Support (2015-Present)

- National Institutes of Health NIGMS (Award No. R01GM100966)

Collaborative experimental and computational studies of conformational transitions in signaling proteins and enzymes

Total Costs: \$1,605,150 (2 PI's, role=PI) *August 2013 – July 2017*

- National Science Foundation (DMR)

DMREF: Programmable Chemomechanical Materials

Total Costs: \$1,159,386 (4 PI's, role=CoPI, PI=Seth Fraden) *September 2015-August 2018*

- National Institute of General Medical Sciences (Award No. 3R01GM108021-08S1)

Administrative supplement to R01GM108021
Total costs: \$149,970 (1 PI, role=PI)

August 2015 – July 2016

- Keck Foundation

Evolutionary Molecular Self-Organization under Extreme Conditions
Total Costs: \$1,000,000 (4 PI's, role=CoPI, PI Irv Epstein)

January 2014 – December 2016

- National Science Foundation (MCB)

Building cellular complexity: from molecular motors to synthetic cilia
Total Costs: \$185,472 (3 PI's, role=CoPI, PI Z. Dogic)

December 2013 – December 2015

(iv) Teaching

- Numerical Modeling Methods in Biology (QB110A): Spring 2013, Spring 2009, Spring 2008, Spring 2007

This is a new course that I designed for undergraduate and graduate students from physics, chemistry, biochemistry, and biology. Applies modern computational techniques to interesting and important problems in biology.

- Graduate Statistical Physics (Phys 163A): Fall 2009, Fall 2018

- Biological Physics (Phys105A): Fall 2010, Fall 2011, Fall 2013, Fall 2015, Fall 2016, Fall 2017, Fall 2019

- Statistical Physics (Phys40): Spring 2011

- Introductory Physics I (Phys11A): Fall 2012

(v) Publications

Under Review:

76. Wagner, C; Hagan, MF*; Baskaran, A*, “Response of active Brownian particles to boundary driving”, under review, [arXiv:1905.12706](https://arxiv.org/abs/1905.12706)

75. Siavashpouri, M; Sharma, P; Fung, J; Hagan, MF; Dogic, Z, “Structure, dynamics and phase behavior of short rod inclusions dissolved in a colloidal membrane”, submitted to Soft Matter, [arXiv:1906.06551](https://arxiv.org/abs/1906.06551)

74. Wood, DA; Zuraw-Weston, S; Torres, IK; Lee, YW; Wang, LS; Jiang, Z; Lázaro, GR; Wang, SY; Rodal, AA; Hagan, MF; Rotello, VR; Dinsmore, AD, “Nanoparticles Binding to Lipid Membranes: from Vesicle-Based Gels to Vesicle Inversion and Destruction”, under review, [arXiv:1805.04214](https://arxiv.org/abs/1805.04214)

73. Fily, Y; Baskaran, A; Hagan, MF, “Active Particles on Curved Surfaces”, submitted, [arXiv:1601.00324](https://arxiv.org/abs/1601.00324)

Accepted or Published:

72. Balchunas, AJ; Cabanas, RA; Zakhary MJ; Gibaud, T; Sharma, P; Hagan MF; Fraden, S; Dogic, Z, “Equation of State of Colloidal Membranes”, Soft Matter, in press, [DOI:10.1039/C9SM01054H](https://doi.org/10.1039/C9SM01054H), [arXiv:1905.13227](https://arxiv.org/abs/1905.13227)

71. Miller, J; Joshi, C; Sharma, P; Baskaran, A; Grason, GM; Hagan, MF; Dogic, Z, “Conformational switching of chiral colloidal rafts regulates raft-raft attractions and repulsions”, PNAS, in press, [arXiv:1902.03341](https://arxiv.org/abs/1902.03341)

70. Dharmavaram, S; She, B.; Lazaro, GR; Hagan, MF; Bruinsma, R, “Gaussian curvature and the budding kinetics of enveloped viruses”, to appear in Plos. Comp. Biol, available at bioRxiv, <https://doi.org/10.1101/457135>

69. Stiller, JB; Kerns, J; Pachov, D; Cho, YJ; Otten, R; Hagan, MF; Kern D “Probing the transition state in enzyme catalysis by high-pressure NMR dynamics” Nat. Catal., In press (2019), link: <https://doi.org/10.1038/s41929-019-0307-6>

68. Joshi, A; Putzig, E; Baskaran, A*; Hagan, MF*, “*The interplay between activity and filament flexibility determines the emergent properties of active nematics*”, *Soft Matter*, **15**, 94 (2019), doi:10.1039/C8SM02202J, [link](#)
67. Mohajerani F; Hagan MF “*The role of the encapsulated cargo in microcompartment assembly*”, *Plos. Comp. Biol.*, **14**, e1006351 (2018), [link](#), PMC6086489
66. Lazaro, GR; Dragnea, B; Hagan, MF, “*Self-assembly of convex particles on spherocylindrical surfaces*”, *Soft Matter*, **14**, 5728 - 5740 (2018) DOI: 10.1039/C8SM00129D, [link](#), NIHMS970685
65. Zeng, C; Lazaro, GR; Tsvetkova, I; Hagan, MF*; Dragnea, B*, “*Defects and Chirality in the Nanoparticle-Directed Assembly of Spherocylindrical Shells of Virus Coat Proteins*”, *ACS Nano*, **12**, 5323–5332 (2018), [DOI:10.1021/acsnano.8b00069], NIHMSID 986481
64. Lazaro, GR; Mukhopadhyay, S; Hagan, MF, “*Why Enveloped Viruses Need Cores—The Contribution of a Nucleocapsid Core to Viral Budding*”, *Biophys. J.*, **114**, 619-630 (2018), [link](#)
63. Norton, MM; Baskaran, A; Opathalage, A; Langeslay, B; Fraden, S; Baskaran, A*; Hagan, MF* “*Insensitivity of active nematic liquid crystal dynamics to topological constraints*”, *Phys. Rev. E*, **97**, 012702 (2018), [link](#)
62. Michaels, TCT; Bellaiche, MMJ; Hagan, MF; Knowles, TPJ, “*Kinetic constraints on the self-assembly of building blocks into closed supramolecular structures*”, *Sci. Reports*, **7**, 12295 (2017), [link](#)
61. Fily, Y; Baskaran, A; Hagan, MF, “*Equilibrium mappings in polar-isotropic confined active particles*”, *Eur. Phys. J. E* **40**, 61 (2017). doi:10.1140/epje/i2017-11551-3, [arXiv:1612.08719](#)
60. Sakhardande, R., Stanojeviea, S., Baskaran, A., Baskaran, A., Hagan, M. F.*, Chakraborty, B., “*Theory of microphase separation in bidisperse chiral membranes.*” *Phys. Rev. E*, **96**, 012704 (2017), [arXiv:1604.03012](#), <https://doi.org/10.1103/PhysRevE.96.012704>
59. Wagner, CG; Hagan, MF; Baskaran, A, “*Steady-state distributions of ideal active Brownian particles under confinement and forcing*” *J. Stat. Mech.*, 043203 (2017), <http://iopscience.iop.org/article/10.1088/1742-5468/aa60a8/meta>
57. Liu, K; Hagan, MF; Lisman, JE, “*Gradation (~10 size states) of synaptic strength by quantal addition of structural modules*” *Phil. Trans. R. Soc. B*, **372**, 20160328 (2017) [link](#)
58. Redner, GS; Wagner, CG; Baskaran, A; Hagan, MF, “*A classical nucleation theory description of active colloid assembly*”, *Phys. Rev. Lett.*, **117**, 148002, [link](#) (2016), [arXiv:1603.01362](#)
56. Yu, N; Ghosh, A; Hagan, MF, “*Faceted particles formed by the frustrated packing of anisotropic colloids on curved surfaces*”, *Soft Matter*, **12**, 8990 (2016), [cover article] NIHMSID 846122 <http://dx.doi.org/10.1039/C6SM01498D>
55. Perlmutter JD; Mohajerani, F; Hagan, MF, *Many-molecule encapsulation by an icosahedral shell*, *eLife* **5**, e14078 (2016); <http://dx.doi.org/10.7554/eLife.14078>
54. Lazaro, GR; Hagan, MF, “*Allosteric control in icosahedral capsid assembly*”, *J. Phys. Chem B*, **120**, 6306-6318 [Bill Gelbart Festschrift] [link](#) (2016) PMID 5367391
53. Perkett, M.R.; Mirijanian, D.T.; Hagan, M.F., “*The Allosteric Switching Mechanism in Bacteriophage MS2*”, *J. Chem. Phys.* **145**, 035101 [cover article], [link](#), [arXiv:1503.01204](#) (2016). PMID 4947040
52. Xie, S; Pelcovits, RA*; Hagan, MF*, “*Probing a self-assembled fd virus membrane with a microtubule*”, *Phys. Rev. E*, **93**, 062608, [link](#) [arXiv:1512.02204](#) (2016)
51. Xie, S; Hagan, MF*; Pelcovits, RA*, “*Interaction of chiral rafts in self-assembled colloidal membranes*”, *Phys. Rev. E*, **93**, 032706 (2016), [link](#) [arXiv:1601.08232](#)
50. Hagan MF; Zandi, R, “*Recent advances in coarse-grained modeling of virus assembly*”, *Curr Opin Virol*, **18**, 36-43 (2016) [link](#) NIHMSID 772743
49. Hagan MF; Baskaran A, “*Emergent self-organization in active materials*”, *Curr Opin Cell Biol*, **38**, 74-80 (2016) [link](#) NIHMS 772743
48. Kelley, CF; Messelaar, EM; Eskin, T; Wang, S; Song, K; Vishnia, K; Becalska, AN; Shupliakov, O; Hagan, MF; Danino, D; Sokolova, O; Nicastro, D; Rodal, AA, “*Membrane charge directs the outcome of F-BAR domain lipid binding and autoregulation*”, *Cell Reports*, **13**, 2597–2609 (2015) [link](#)
47. Perlmutter, J.D.; Hagan, M.F., “*Mechanisms of Virus Assembly*”, *Annu. Rev. Phys. Chem.*, **66**, 217–39 (2015), [link](#), [arXiv:1407.3856](#)

46. Ruiz-Herrero, T., Hagan, M.F., “*Simulations show that Virus Assembly on a Membrane is Facilitated by Membrane Microdomains*”, *Biophys. J.*, **108**, 585-595 (2015), [arXiv:1403.2269](#), [\[link\]](#), PMID 4317536
45. Perlmutter, J.D.; Hagan, M.F., “*The role of packaging sites in efficient and specific virus assembly*”, *J. Mol. Biol.*, **427**, 2451–2467 (2015), [doi:10.1016/j.jmb.2015.05.008](#) PMID 691930
44. DeCamp, S.J.; Redner, G.; Baskaran, A.; Hagan, M.F.*; Dogic, Z*, “*Orientalional order of motile defects in active nematics*”, *Nature Mater.*, **14**, 1110–1115 (2015) [\[link\]](#)
43. Fily, Y.; Baskaran, A.; Hagan, M.F., “*Dynamics and density distribution of strongly confined noninteracting nonaligning self-propelled particles in a nonconvex boundary*”, *Phys. Rev. E*, **91**, 012125 (2015), [\[link\]](#), [arXiv:1410.5151](#)
42. Pontiggia, F.; Pachov, D.; Clarkson, M.; Villali, J.; Hagan, M.F.; Pande, V.; Kern, D., “*Free energy landscape of activation in a signaling protein at atomic resolution*”, *Nat. Comm.*, **6**, 7284 (2015) doi:10.1038/ncomms8284, [\[link\]](#), PMID: PMC4470301
41. Hilitski, F.; Ward, A.R.; Cajamarca, L.; Hagan, M.F.; Grason, G.M.; Dogic, Z., “*Measuring cohesion between macromolecular filaments, one pair at a time: Depletion-induced microtubule bundling*”, *Phys. Rev. Lett.*, **114**, 138102 (2015), [arXiv:1408.5068](#)
40. Kerns, S.J.; Agafonov, R.V.; Cho, Y.J.; Pontiggia, F.; Otten, R.; Pachov, D.V.; Kutter, S.; Phung, L.A.; Murphy, P.N.; Thai, V.; Alber, T.; Hagan, M.F.; Kern, D., “*The energy landscape of adenylate kinase during catalysis*”, *Nat. Struct. Mol. Biol.* **22**, 124–131 (2015) doi:10.1038/nsmb.2941, [\[link\]](#) PMID: PMC4318763
39. Sharma, P.; Ward, A.R.; Gibaud, T.; Hagan, M.F.; Dogic, Z., “*Hierarchical organization of chiral rafts in colloidal membranes*”, *Nature*, **513**, 77–80 (2014) [\[link\]](#)
38. Perlmutter, J.D.; Perkett, M.R.; Hagan, M.F., “*Pathways for virus assembly around nucleic acids*”, *J. Mol. Biol.*, **426**, 3148–3165 (2014), [\[link\]](#), PMID 4135015
37. Fily, Y., Baskaran, A., Hagan, M.F. “*Dynamics of Self-Propelled Particles Under Strong Confinement*”, *Soft Matter*, **10**, 5609-5617 (2014) [\[link\]](#), [arXiv:1402.5583](#)
36. Perkett, M.R., Hagan, M.F., “*Using Markov State Models to Study Self-Assembly*”, *J. Chem. Phys.*, **140**, 214101 (2014), [\[link\]](#) PMID: PMC4048447 [Cover Article]
35. Villali, J., Pontiggia, F., Clarkson, M.W., Hagan, M.F., Kern, D. “*Evidence against the ‘Y-T coupling’ mechanism of activation in the response regulator NtrC*”, *J. Mol. Biol.*, **426**, 1554–1567, (2014), doi: [10.1016/j.jmb.2013.12.027](#), PMID 4384162
34. Chelakkot, R.; Gopinath, A.; Mahadevan, L.*; Hagan, M.F.*, “*Flagellar dynamics of a connected chain of active, Brownian particles*”, *J. R. Soc. Interface*, **11**, 20130884 (2014) ([http://dx.doi.org/10.1098/rsif.2013.0884](#))
33. Perlmutter, J.D.; Qiao, C.; Hagan, M.F. “*Viral genome structures are optimal for capsid assembly*”, *eLife*, 2:e00632 (2013) [http://elife.eelifesciences.org/content/2/e00632](#); PMID 3683802
32. Redner, G.; Baskaran, A.; Hagan, M.F., “*Reentrant Phase Behavior in Active Colloids with Attraction*”, *Phys. Rev. E*, **88**, 012305 (2013), [Subject of a Physical Review Focus, [Physics 6, 134 \(2013\)](#)]
31. Hagan, M.F. “*Modeling Viral Capsid Assembly*”, *Adv. Chem. Phys.*, **155**, Ch 1, 1-68 (2014), [arXiv:1301.1657](#) [invited review article] PMID 4318123
30. Redner, G., Hagan, M.F.*, Baskaran, A.*, “*Structure and Dynamics of a Phase-Separating Active Colloidal Fluid*” *Phys. Rev. Lett.*, **110**, 055701 (2013), [arXiv:1207.1737](#)
- * co-corresponding author
29. Yu, N., Hagan, M.F., “*Simulations of HIV capsid protein dimerization reveal the effect of chemistry and topography on the mechanism of hydrophobic protein association*” *Biophys. J.* **103**, 1363-1369 (2012) [Featured Article]
28. Ruiz-Herrero, T., Velasco, E., Hagan, M.F., “*Mechanisms of budding of nanoscale particles through lipid bilayers*” *J. Phys. Chem B*, **116**, 9595-603 (2012) [arXiv:1202.4691](#)
27. Giomi, L., Mahadevan, L., Chakraborty, B., and Hagan, M.F. “*Banding, excitability and chaos in active nematic suspensions*”, *Nonlinearity*, **25**, 2245–2269 (2012) [\[link\]](#)

26. Dhason, M.S, Wang, J. C., Hagan, M.F., Zlotnick, A. “*Differential assembly of Hepatitis B Virus core protein on single- and double-stranded nucleic acid suggests the dsDNA-filled core is springloaded*”, *Virology*, **430**, 20-29 (2012)
25. Gopinath, A., Hagan, M.F., Marchetti, M.C., Baskaran, A. “*Dynamical Self-regulation in Self-propelled Particle Flows*” *Phys. Rev. E*, **85**, 061903 (2012)
24. Ni, P., Wang, Z., Ma, X., Das, N.C., Sokol, P., Chiu, W., Dragnea, B., Hagan, M.F.*, Kao, C.C*., “*An Examination of the Electrostatic Interactions between the N-Terminal Tail of the Coat Protein and RNA in Brome Mosaic Virus*”, *J. Mol. Biol.*, **419**, 284-300 (2012)
- *co-corresponding author
23. Patel, A.J; Varilly, P.; Jamadagni, S.N.; Hagan, M.F.; Chandler, D.; and Garde, S. “*Sitting at the edge: How biomolecules use hydrophobicity to tune their interactions and function*”, *J. Phys. Chem. B*, **116**, 2498-2503 (2012), arXiv:1109.4431
22. T. Gibaud, E. Barry, M. Zakhary, A. Ward, C. Berciu, Y. Yang, M.F. Hagan, R. Oldenbourg, D. Nicastro, R. Meyer, Z. Dogic. “*Reconfigurable self-assembly through chiral control of interfacial tension*”, *Nature*, **481**, 348-351 (2012)
21. McCandlish, S.R, Baskaran, A., and Hagan, M.F. “*Spontaneous Segregation of Self-Propelled Particles with Different Motilities*”, *Soft Matter*, **8**, 2527-2534 (2012), [\[link\]](#) arXiv:1110.2479
20. Yang Y., Barry E., Dogic Z. and Hagan, M.F. “*Self-assembly of 2D membranes from mixtures of hard rods and depleting polymers*”, *Soft Matter*, **8**, 707 (2012), [\[link\]](#), arXiv:1103.2760
19. Yang Y. and Hagan, M.F. “*Theoretical calculation of the phase behavior of colloidal membranes*” *Phys. Rev. E*, **84**, 051402 (2011)
18. Hagan, M.F., Elrad O.M., and Jack R.L. “*Mechanisms of kinetic trapping in self-assembly and phase transformation*”, *J. Chem. Phys.*, **135**, 104115 (2011)
17. Giomi L., Mahadevan L., Chakraborty, B., and Hagan, M.F. “*Excitable Patterns in Active Nematics*”, *Phys. Rev. Lett* **106**, 218101 (2011)
16. Sumedha; Hagan, M.F.; Chakraborty, B. “*Prolonging assembly through dissociation: A self-assembly paradigm in microtubules*”, *Phys. Rev. E*, **83**, 051904 (2011)
15. Elrad O.M.; Hagan, M.F. “*Encapsulation of a Polymer by an Icosahedral Virus*”, *Phys. Biol.*, **7**, 045003 (2010), Part of a special focus issue on physical virology.
14. Yang, Y.; Meyer, R.B.; Hagan, M.F. “*Self-limited self-assembly of chiral filaments*”, *Phys. Rev. Lett.*, **104**, 258102 (2010)
13. Kivenson, A.; Hagan, M.F. “*Mechanisms of Capsid Assembly around a Polymer*”, *Biophys. J.*, **99**, 619-628 (2010)
12. Hagan, M.F. and Elrad O.M. “*Understanding the Concentration Dependence of Viral Capsid Assembly Kinetics - the Origin of the Lag Time and Identifying the Critical Nucleus Size*”, *Biophys. J.*, **98**, 1065-1074 (2010)
11. Hagan, M.F. “*A theory for viral capsid assembly around electrostatic cores*”, *J. Chem. Phys.*, **130**, 114902 (2009)
10. Huang, F.; Addas, K.; Ward, A ; Flynn, N.T.; Hagan, M.F.; Dogic, Z.; Fraden, S. “*The pair potential of colloidal stars*”, *Phys. Rev. Lett.*, **102**, 108302 (2009)
9. Whitelam, S.; Feng, E.H.; Hagan, M.F.; Geissler, P.L. “*The role of collective motion in examples of coarsening and self-assembly*”, *Soft Matter*, **6**, 1251-1262 (2009) (Special issue on Self-Assembly)
8. Elrad, O.M.; Hagan, M.F. “*Mechanisms of size control and polymorphism in viral capsid assembly*”, *Nano Letters*, **8**, 3850-3857 (2008)
7. Hagan, M. F. “*Controlling viral capsid assembly with templating*”, *Phys. Rev. E*, **77**, 051904 (2008)

Publications from postdoctoral and graduate work

6. Jack, R. L.; Hagan, M. F.; Chandler, D. “*Fluctuation-dissipation ratios in the dynamics of self-assembly*”, *Phys. Rev. E*, **76**, 021119 (2007)
5. Hagan, M. F.; Chandler, D. “*Dynamic Pathways for Viral Capsid Assembly*”, *Biophys. J.*, **91**,42 (2006)
4. Hagan, M. F.; Chakraborty, A. K. “*Hybridization Dynamics of Surface Immobilized DNA*”, *J. Chem. Phys.*, **120**, 4958 (2004)

3. Hagan, M. F.; Dinner, A. R.; Chandler, D.; Chakraborty, A. K. “*Atomistic Understanding of Kinetic Pathways for Single Base-Pair Binding and Unbinding in DNA*”, Proc. Natl. Acad. Sci. USA, **100**, 13922 (2003)
2. Hagan, M. F.; Majumdar, A.; Chakraborty, A. K. “*Nanomechanical Forces Generated by Surface Grafted DNA*”, J. Phys. Chem. B, **106**, 10163 (2002)
1. Wu, G.; Haifeng, J.; Hansen, K.; Thundat, T.; Datar, R.; Cote, R.; Hagan, M. F.; Chakraborty, A. K.; Majumdar, A. “*Origin of Nanomechanical Cantilever Motion Generated from Biomolecular Interactions*”, Proc. Natl. Acad. Sci. USA, **98**, 1560 (2001).

(vi) Patents

- Barry, E., Dogic, Z., Hagan, M.F., Yang, Y., Perlman, D. “*Aligned Arrays of Nanorods, and Methods of Making and Using Them*”, patent pending

(vii) Selected Recent Invited Presentations/Appearances (2014 - May 2019)

- 2019 International Workshop on Soft Matter and Biophysics Theories, Beijing, China, May 2019
- American Chemical Society Annual Meeting invited presentation, Orlando, FL, March 2019
- UMASS Condensed Matter Seminar, Amherst, MA, November 2018
- Central Florida University Physics Colloquium, Orlando, FL, October 2018
- Penn Institute for Computational Science (PICS) Symposium 2018, Philadelphia, PA, October 2018
- Cornell Chemistry Colloquium, Ithaca, NY, September 2018
- MIT Physical Math Seminar, Cambridge, MA, May 2018
- Ludwig Maximilian University of Munich, CeNS-Colloquium, Munich, Germany, April 2018
- Foundations of Nanoscience (FNANO) Conference, Snowbird, UT, April 2018
- American Physical Society March Meeting invited presentation, Los Angeles, CA March, 2018
- Indiana University Capsid Club Seminar, Bloomington, IN, February 2018
- Indiana University Biochemistry Colloquium, Bloomington, IN, February 2018
- James Frank Institute Seminar (Univ. of Chicago), Chicago, IL, January 2018
- Berkeley Statistical Mechanics Meeting (Active Matter pre-meeting), Berkeley, CA, January 2018
- Mt. Holyoke Physics Seminar, South Hadley, Mass, Nov. 2017
- UPENN Biochemistry and Biophysics Seminar, Philadelphia, PA, Nov. 2017
- Squishy Physics Seminar, Harvard, Mass, October 2017
- University of Oxford, Physics Seminar, Oxford, UK, October 2017
- University of Bristol, Joint Mathematics and Life Sciences Seminar, Bristol, UK, October 2017
- Heinrich Pette Institute - Leibniz Institute for Experimental Virology Seminar Series, Hamburg, Germany, July 2017
- “Integrative Analysis of Pathogen Replication and Spread”, International Symposium of Collaborative Research Center, Heidelberg, Germany, July 2017
- Workshop on Physical Virology, International Center for Theoretical Physics (ICTP), Trieste, Italy, July 2017 (upcoming)
- Celebration of the Life and Work of David Chandler, Berkeley, CA, June 2017
- Univ. of California Riverside Condensed Matter Seminar, Riverside, CA, April, 2017
- Carolyn and Charles Knobler Lecture, UCLA, April, 2017
- Physical Virology Gordon Conference, Il Ciocco, Tuscany, Italy, January 2017
- LBNL Molecular Foundry Seminar Series, Berkeley, CA, October 2016
- Bad Honnef Physics School on Self-assembly, Lecturer, Bad Honnef, Germany, September 2016
- European Physical Society Condensed Matter Division Annual Meeting (CMD26), Physics of Protein Nanoshells Minicolloquium, Groningen, the Netherlands, September 2016
- Partial Order in Materials: Analysis, Simulations and beyond, Montreal, June 2016
- Cell Physics 2016, Saarland University, Saarbrücken, Germany, June 2016
- 2016 Workshop on Kinetics and Markov State Models in Drug Design, Novartis Institutes for Biomedical Research, Cambridge, MA, May 2016
- University of Virginia Chemistry Colloquium, April, 2016
- Rockefeller University Physics Center Seminar Series, April, 2016

- UPENN Bioengineering Colloquium, December, 2015
- Rochester Institute of Technology Physics Colloquium, November 2015
- University of Chicago Physics Colloquium, October 2015
- Sissa Mini-Workshop 2015 on 'Statistical and Molecular Biophysics', Trieste, Italy, October 2015
- CECAM-Lorentz workshop, Virus as a whole: meso- and macroscopic structure and dynamics at all atom resolution, Lausanne, Switzerland October 2015
- Kinetic Networks: From topology to design, Sante Fe Institute, Sante Fe, NM, September 2015
- CECAM workshop, The Physics of Protein Self-Assembly, Lausanne, Switzerland June 2015
- Aspen Center for Physics, Physics and Mathematics of Viral Assembly program, June-July 2015
- Numerical Methods in Cell Biology Workshop, San Francisco, CA, March 2015, <http://qcbnet.ucsf.edu>
- Berkeley Mini Statistical Mechanics Meeting, January, 2015
- Kent State University, Liquid Crystal Institute Soft Matter Seminar Series, November, 2014
- Georgia Tech Soft Condensed Matter and Biophysics Seminar Series, November, 2014
- Statistical Mechanics in Physics, Chemistry, and Biology. A symposium celebrating David Chandler's 70th Birthday, MIT, October, 2014
- MIT Biophysics Seminar Series, October, 2014
- Johns Hopkins Biophysics Seminar Series, September, 2014
- Brown University Condensed Matter and Biological Physics Seminar Series, September, 2014
- Lecturer for the summer school on “Self-assembled soft matter nano structures at interfaces” organized by the International Graduate Research Training Group (<http://www.ssni.tu-berlin.de>) and the Research Triangle Materials Research Science and Engineering Center, August 2014, Beverly, MA
- FASEB Science Research Conferences, Virus Structure and Assembly, July, 2014, Saxons River, VT
- Northwestern Engineering Sciences and Applied Math seminar, April 2014
- Kavli Institute for Theoretical Physics workshop, Active Matter: Cytoskeleton, Cells, Tissues and Flocks, Santa Barbara, CA, Spring 2014
- APS Annual Meeting, March 2014, Denver, CO
- Harvard Physical Chemistry Seminar, February, 2014
- UMASS Boston Physics Colloquium Series, February, 2014
- MIT Physical Chemistry Seminar, February, 2014

(viii) Honors and Awards

- Alberta Gotthardt Strage '56 and Henry Strage Award for Aspiring Young Science Faculty (2012)
- National Institutes of Health Ruth L. Kirchstein National Research Service Award, Individual Postdoctoral Fellowship, 2005
- National Science Foundation Graduate Research Fellow, 1999

(ix) Outreach Activities

- Vice chair for Physical Virology Gordon Conference (1/2019), Chair for 1/2021
 - Head organizer for the annual Greater Boston Area Statistical Mechanics Meeting (<https://sites.google.com/a/brandeis.edu/gbasm/>)
- Co-organizer for Molecular Biophysics in the Northeast Workshop, <http://mbn2019.org>
- Advisory board member: CSSAS: The Center for the Science of Synthesis Across Scales, a DOE Energy Frontiers Research Center (EFRC) at University of Washington and PNNL.
 - Portal to the Public Science Communications Fellow 2014. This is a program in which scientists participate in 10 hours of professional development workshops to learn effective outreach and communications skills. Subsequently each Fellow develops a hands-on activity to explain his/her research to the public. I developed an activity explaining the physics and geometry of self-assembly in viruses and technology, which I presented at the Discovery Museums in Acton, MA <http://discovery museums.org/programs-events/portal-public>

- Member of NSF review panels
- Member of the Lawrence Berkeley National Lab Molecular Foundry Theory Facility Proposal Study Panel
- Member of DOE INCITE review panel 2017, 2018, 2019
- DOE Center for Integrated Nanotechnologies (CINT) External Proposal Review Board member
- Session chair at numerous meetings, including APS Annual meetings and the Berkeley Statistical Mechanics Meetings
- Reviewer for journals relevant to the field including: *Nature*, *Science*, *Science Advances*, *PNAS*, *JACS*, *Virology*, *J. Virology*, *Biophysical Journal*, *Nature Physics*, *Nature Materials*, *Nature Comm.*, *ACS Nano*, *Nano Letters*, *Physical Review Letters*, *Physical Review E*, *Journal of Chemical Physics*, *Journal of the Royal Society Interface*, *Physical Biology*, *Chemical Physics*, *J. Mol. Biol.*
- Reviewer for funding proposals from agencies including: *NIH*, *NSF*, *DOE*, *the Israel Science Foundation*, *Swiss National Science Foundation*, *the Medical Research Council (UK)*, and *the Netherlands Foundation for Fundamental Research on Matter*
- Co-wrote transition path sampling module for CHARMM

(x) Thesis Advisor and Postgraduate-Scholar Sponsor

Total Numbers Advised: 15 graduate students (7 graduated), 16 postdoctoral fellows

Postdoctoral Fellows: Luca Giomi (Prof., Leiden U., Netherlands), Arvind Gopinath (Asst. Prof., UC Merced), Sumedha Sumedha (Asst. Prof. NISER, Bhubaneswar, India), Raghunath Chelakkot (Asst. Prof. IIT Bombay), Yaouen Fily (Asst. Prof., Florida Atlantic Univ.), Jason Perlmutter (Google), Sudhir Pathak (Nanyang Technological University), Qing Lu (Ames Lab, Iowa), Dina Mirijanian (Data Scientist for NYC Police Dept.), Abhijit Ghosh (Brandeis), Guillermo Lazaro (Data Scientist, AIA / Barcelona), Kang Liu (Data Scientist at Wolters Kluwer Health, Waltham, MA), Arvind Baskaran (Engagement Manager, Mu Sigma Inc., Boston), Michael Norton (Research Professor, Penn State), Surendra W. Singaram (Brandeis), Botond Tyudoki (Brandeis), John Edison (Brandeis)

Graduate Students: Gabriel Redner (Google), Oren Elrad (Apple), Yasheng Yang (Google), Aleksandr Kivenson (Schrodinger, NY, NY), Matthew Perkett (GE Healthcare, Denver), Cong Qiao (Two Sigma, NYC), Naiyin Yu (Operations Analyst for YES Writing), Farzaneh Mohajerani (Brandeis), Lev Tsidilkovski (Brandeis), Matthew Peterson (Brandeis), Chaitanya Joshi (Brandeis), Sarvesh Uplap (Brandeis), Kanaya Malakar (Brandeis)