

Sujit S. Datta

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Professional Positions

August 2017 – present: *Princeton University*

Assistant Professor and Director of Graduate Studies of Chemical & Biological Engineering

Co-Leader, Princeton Center for Complex Materials Interdisciplinary Research Group B

Senior Investigator, Center for the Physics of Biological Function

Associated Faculty: Princeton Institute of Materials, Princeton Bioengineering Initiative,

Andlinger Center for Energy and the Environment, High Meadows Environmental Institute

Education and Training

October 2013 – June 2017: *California Institute of Technology*

Postdoctoral Fellow in Chemical Engineering

Mentor: Rustem F. Ismagilov

September 2008 – September 2013: *Harvard University*

Ph.D. in Physics, additional concentration in Engineering and Physical Biology; A. M. in Physics

Thesis advisor: David A. Weitz

September 2004 – May 2008: *University of Pennsylvania*

M. S. in Physics, concentration in nanoscience; B. A. in Mathematics and Physics (honors), summa cum laude

Thesis advisor: A. T. Charlie Johnson, Jr.

Selected Honors and Awards

- Princeton Engineering Commendation for Outstanding Teaching, 2018, 2019, 2020, 2022
- Camille Dreyfus Teacher-Scholar Award, 2022
- International Society for Porous Media (InterPore) Award for Porous Media Research, 2022
- Pew Scholar in the Biomedical Sciences, 2021
- Outstanding paper of the year award, *Biophysical Journal*, 2021
- Stanley Corrsin Memorial Lecturer, Johns Hopkins University, 2021
- American Institute of Chemical Engineers (AIChE) 35 Under 35 Award, 2020
- ACS Unilever Award For Outstanding Young Investigator in Colloid & Surfactant Science, 2020
- US National Academy of Engineering (NAE) Frontiers of Engineering Selectee, 2020
- NSF CAREER Award, 2019
- Alfred Rheinstein Award (Princeton University) recognizing excellence in teaching and scholarship, 2018
- American Chemical Society (ACS) Petroleum Research Fund Doctoral New Investigator Award, 2018
- APS Andreas Acrivos Dissertation Award in Fluid Dynamics, 2015
- American Physical Society (APS) LeRoy Apker Award, 2008

Research Overview

My lab's research focuses on the physicochemical dynamics of soft ("squishy") and living systems in complex environments. We focus on microstructured complex fluids, swellable and shrinkable gels, and bacterial communities/active matter, motivated by challenges in energy, environment, and biotechnology. Our work integrates microscopy, microfluidics, soft materials chemistry, and biophysical characterization. We also complement our experiments with theoretical & computational modeling, applying ideas from fluid and solid mechanics, colloidal science, polymer physics and chemistry, statistical mechanics, and network science.

Publications (>3700 Google Scholar Citations; h index = 28)

* denotes Datta as corresponding author, † denotes equal contribution, + denotes undergraduates

Work from Princeton – 48 total:

Submitted/under review – 8 total:

75. Elastic turbulence homogenizes fluid transport in stratified porous media
C. A. Browne, R. B. Huang⁺, C. W. Zheng⁺, S. S. Datta*
pre-print available at *arxiv* 2207.05649
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
74. Roughening instability of growing 3D bacterial colonies
A. Martínez-Calvo†, T. Bhattacharjee†, R. K. Bay, H. N. Luu⁺, A. M. Hancock, N. S. Wingreen*, S. S. Datta*
pre-print available at *bioRxiv* 2022.05.09.491177
Relevant research areas: [Active and living matter](#)
73. Microbial mutualism generates multistable and oscillatory growth dynamics
D. B. Amchin, A. Martínez-Calvo, S. S. Datta*
pre-print available at *bioRxiv* 2022.04.19.488807
Relevant research areas: [Active and living matter](#)
72. Lab on a chip for a low carbon future
S. S. Datta*, I. Battiato, M. Fernø, R. Juanes, S. Parsa,
V. Prigiobbe, E. Santanach-Carreras, W. Song, D. Sinton*
Relevant research areas: [Complex fluids](#), [Flow in porous media](#), [Nanoscience](#)
71. Tuning morphologies and reactivities of hybrid organic-inorganic nanoparticles
J. Schneider, J. Liu, V. Lee, R. K. Prud'homme, S. S. Datta, R. D. Priestley
Relevant research areas: [Complex fluids](#), [Nanoscience](#)
70. Quick release anti-fouling hydrogels for solar-driven water purification
X. Xu, N. Guillomaitre, K. Christie, R. K. Bay, N. Bizmark, S. S. Datta, Z. J. Ren, R. D. Priestley
Relevant research areas: [Complex fluids](#), [Nanoscience](#)
69. Chemorepellent-loaded nanocarriers promote localized interference of *E. coli* transport to inhibit biofilm
T. Kuper, L. Wang, R. K. Prud'homme, S. S. Datta, R. M. Ford
Relevant research areas: [Active and living matter](#), [Nanoscience](#)
68. Mucin glycans maintain coexistence in oral microbial communities
C. Wu, K. Wheeler, G. Cárcamo-Oyarce, K. Aoki, A. McShane,
S. S. Datta, J. M. Welch, M. Tiemeyer, A. Griffen, K. Ribbeck
Relevant research areas: [Active and living matter](#)

Published or in press – 40 total:

67. A biophysical threshold for biofilm formation
J. A. Ott, S. Chiu⁺, D. B. Amchin, T. Bhattacharjee, S. S. Datta*, *eLife*, 11, e76380 (2022)
Relevant research areas: [Active and living matter](#)
66. Influence of confinement on the spreading of bacterial populations
D. B. Amchin, J. A. Ott, T. Bhattacharjee, S. S. Datta*, *PLoS Computational Biology*, 18, e1010063 (2022)
Relevant research areas: [Active and living matter](#)

65. Cellular sensing governs the stability of chemotactic fronts
R. Alert*, A. Martínez-Calvo, S. S. Datta*, *Physical Review Letters*, 128, 148101(2022)
Relevant research areas: [Active and living matter](#)
64. Chemotactic smoothing of collective migration
T. Bhattacharjee†, D. B. Amchint†, R. Alert†, J. A. Ott, S. S. Datta*, *eLife*, 11, e71226(2022)
Relevant research areas: [Active and living matter](#)
Profiled in multiple press outlets, including *Quanta*
63. Active transport in complex environments
A. Martínez-Calvo, C. Trenado-Yuste, S. S. Datta*,
Book chapter in *Out-of-Equilibrium Soft Matter: Active Fluids*, RSC press(in press)
Relevant research areas: [Active and living matter](#)
62. Perspectives on viscoelastic flow instabilities and elastic turbulence
S. S. Datta*, A. M. Ardekani, P. E. Arratia, A. N. Beris, I. Bischofberger, J. G. Eggers,
J. Esteban Lopez-Aguilar, S. M. Fielding, A. Frishman, M. D. Graham, J. S. Guasto, S. J. Haward, S. Hormozi,
G. H. McKinley, R. J. Poole, A. Morozov, V. Shankar, E. S. G. Shaqfeh, A. Q. Shen, H. Stark, V. Steinberg,
G. Subramanian, H. A. Stone*, *Physical Review Fluids*, 7, 080701(2022)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
61. Flow-driven channelization in a particle-filled porous medium
N. Bizmark and S. S. Datta*, *Album of Porous Media Structure and Dynamics*, Springer publishing (in press)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#), Nanoscience, [Transport in networks](#)
60. The characteristics of time-dependent changes of coefficient of permeability
for superabsorbent polymer-soil mixtures
J. Misiewicz, S. S. Datta, K. Lejcuś, D. Marczak, *Materials*, 15, 4465(2022)
Relevant research areas: [Soft mechanics](#), [Flow in porous media](#)
59. Hysteresis in the thermally induced phase transition of cellulose ethers
N. Bizmark, N. Caggiano, J. Liu, C. Arnold, R. K. Prud'homme, S. S. Datta, R. D. Priestley,
Soft Matter, 18, 6254(2022)
Relevant research areas: [Complex fluids](#), Nanoscience
58. Thermo-responsive polymers for water treatment and collection
X. Xu, N. Bizmark, K. Christie, S. S. Datta, Z. J. Ren, R. D. Priestley, *Macromolecules*, 55, 1894(2022)
Relevant research areas: [Complex fluids](#), Nanoscience
Selected as an *ACS Editors' Choice*
57. Chemotactic migration of bacteria in porous media
T. Bhattacharjee†, D. B. Amchint†, J. A. Ott, F. Kratz, S. S. Datta*, *Biophysical Journal*, 120, 3483(2021)
Relevant research areas: [Active and living matter](#)
Selected by the Editors of *Biophysical Journal* as one of three most outstanding papers of the year
56. A geometric criterion for the optimal spreading of active polymers in porous media
C. Kurzthaler†, S. Mandali†, T. Bhattacharjee, H. Löwen, S. S. Datta, H. A. Stone,
Nature Communications, 12, 7088(2021)
Relevant research areas: [Active and living matter](#)
55. Impact of confined geometries on hopping and trapping of motile bacteria in porous media
L. J. Perez, T. Bhattacharjee, S. S. Datta, R. Parashar, N. L. Sund, *Physical Review E*, 103, 012611(2021)
Relevant research areas: [Active and living matter](#)

54. Elastic turbulence generates anomalous flow resistance in porous media
C. A. Browne and S. S. Datta*, *Science Advances*, 7, eabj2619 (2021)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
Profiled in multiple press outlets, including *Scientific American* and *Quanta*
53. Using colloidal deposition to mobilize immiscible fluids from porous media
J. Schneider, R. D. Priestley, S. S. Datta*, *Physical Review Fluids*, 6, 014001 (2021)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
52. Numerical investigation of multistability in the unstable flow of a polymer solution through porous media
M. Kumar, S. Aramideh, C. A. Browne, S. S. Datta, A. Ardekani, *Physical Review Fluids*, 6, 033304 (2021)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
51. Forced imbibition in stratified porous media: fluid dynamics and breakthrough saturation
N. B. Lu†, D. B. Amchint†, S. S. Datta*, *Physical Review Fluids*, 6, 114007 (2021)
Relevant research areas: [Flow in porous media](#), [Transport in networks](#)
50. Under pressure: Hydrogel swelling in a granular medium
J-F Louf, N. B. Lu, M. G. O'Connell+, H. J. Cho, S. S. Datta*, *Science Advances*, 7, eabd2711 (2021)
Relevant research areas: [Soft mechanics](#)
49. Poroelastic relaxation of hydrogel particles
J-F Louf and S. S. Datta*, *Soft Matter*, 17, 3840 (2021)
Relevant research areas: [Soft mechanics](#), [Flow in porous media](#)
48. Scaling laws to predict humidity-induced swelling and stiffness in hydrogels
Y. Gao, N. K. K. Chai, N. Garakani, S. S. Datta*, H. J. Cho*, *Soft Matter*, 17, 9893 (2021)
Relevant research areas: [Soft mechanics](#)
47. Bioinspired elastic hydrogel for solar-driven clean water purification
X. Xu, S. Ozden, N. Bizmark, C. B. Arnold, S. S. Datta, R. D. Priestley, *Advanced Materials*, 33, 2007833 (2021)
Relevant research areas: [Complex fluids](#), [Soft mechanics](#)
46. Evolution of polymer colloid structure during precipitation and phase separation
J. Liu, N. Bizmark, D. Scott, R. A. Register, M. Haataja, S. S. Datta, C. B. Arnold, R. D. Priestley, *JACS Au*, 1, 936 (2021)
Relevant research areas: [Complex fluids](#), [Nanoscience](#)
45. Reversible pH-driven flocculation of ionomer-coated nanoparticles for rapid filtration and concentration
K. D. Ristroph, J. A. Ott, L. A. Issah+, B K. Wilson, A. Kujović+, M. Armstrong, S. S. Datta, R. K. Prud'homme
ACS Applied Nano Materials, 4, 8690 (2021)
Relevant research areas: [Complex fluids](#), [Nanoscience](#)
44. Infection percolation: a dynamic network model of disease spreading
C. A. Browne†, D. B. Amchint†, J. Schneider†, S. S. Datta*, *Frontiers in Physics*, 9, 645954 (2021)
Relevant research areas: [Transport in networks](#)
43. Multi-scale dynamics of colloidal deposition and erosion in porous media
N. Bizmark, J. Schneider, R. D. Priestley, S. S. Datta*, *Science Advances* 6, eabc2530 (2020)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
Profiled in multiple press outlets, including the *Times of India*.
42. Bistability in the unstable flow of polymer solutions through pore constriction arrays
C. A. Browne, A. Shih+, S. S. Datta*, *Journal of Fluid Mechanics*, 890, A2 (2020)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)

41. Forced imbibition in stratified porous media
N. B. Lu†, A. A. Pahlavan†, C. A. Browne, D. B. Amchin, H. A. Stone, S. S. Datta*,
Physical Review Applied, 14, 054009 (2020)
Relevant research areas: [Flow in porous media](#)
40. Elastocapillary network model of inhalation
J-F Louft, F. Kratz†, S. S. Datta*, *Physical Review Research*, 2, 043382 (2020)
Relevant research areas: [Active and living matter](#), [Soft mechanics](#), [Complex fluids](#), [Transport in networks](#)
39. *In silico* design enables the rapid production of surface-active colloidal amphiphiles
T. I. Morozova, V. E. Lee, N. Bizmark, S. S. Datta, R. K. Prud'homme, A. Nikoubashman, R. D. Priestley,
ACS Central Science, 6, 166 (2020)
Relevant research areas: [Complex fluids](#), Nanoscience
38. Bacterial hopping and trapping in porous media
T. Bhattacharjee and S. S. Datta*, *Nature Communications* 10, 2075 (2019)
Relevant research areas: [Active and living matter](#)
37. Confinement and activity regulate bacterial motion in porous media
T. Bhattacharjee and S. S. Datta*, *Soft Matter*, 15, 9920 (2019)
Relevant research areas: [Active and living matter](#)
36. Pore-scale flow characterization of polymer solutions in microfluidic porous media
C. A. Browne, A. Shih+, S. S. Datta*, *Small*, 16, 1903944 (2019)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
35. Transport of polymer colloids in porous media
N. Bizmark, J. Schneider, E. K. De Jong+, S. S. Datta*, book chapter in *Polymer Colloids*, RSC press (2019)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
34. Controlling capillary fingering using pore size gradients in disordered media
N. B. Lu, C. A. Browne, D. B. Amchin, J. K. Nunes, S. S. Datta*, *Physical Review Fluids* 4, 084303 (2019)
Relevant research areas: [Flow in porous media](#)
Selected as an Editor's Suggestion in *Physical Review Fluids*
33. Scaling law for cracking in shrinkable granular packings
H. J. Cho and S. S. Datta*, *Physical Review Letters*, 123, 158004 (2019)
Relevant research areas: [Soft mechanics](#)
32. Crack formation and self-closing in shrinkable, granular packings
H. J. Cho, N. B. Lu, M. P. Howard, R. A. Adams+, S. S. Datta*, *Soft Matter* 15, 4689 (2019)
Relevant research areas: [Soft mechanics](#), [Flow in porous media](#)
31. Cooperative size sorting of deformable particles in porous media
M. G. O'Connell†, N. B. Lu†, C. A. Browne†, S. S. Datta*, *Soft Matter* 15, 3620 (2019)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#), [Flow in porous media](#)
30. Adsorption and denaturation of structured polymeric nanoparticles at an interface
C. Tian, J. Feng, H. J. Cho, S. S. Datta, R. K. Prud'homme, *Nano Letters* 18, 4854 (2018)
Relevant research areas: [Complex fluids](#), Nanoscience
29. Suppressing viscous fingering in structured porous media
H. S. Rabbani, D. Or, Y. Liu, C-Y Lai, N. B. Lu, S. S. Datta, H. A. Stone, and N. Shokri, *PNAS* 115, 4833 (2018)
Relevant research areas: [Flow in porous media](#)

28. Microfluidic Model Porous Media: Fabrication and Applications
A. Anbari, H-T Chien, S. S. Datta*, W. Deng, D. A. Weitz, and J. Fan*, *Small* 14, 1703575 (2018)
Relevant research areas: [Flow in porous media](#)

Work Conducted Prior To Princeton – 27 total:

27. High-molecular-weight polymers from dietary fiber drive aggregation of particulates in the murine small intestine
A. Preska Steinberg, S. S. Datta, T. Naragon, J. C. Rolando, S. R. Bogatyrev, R. F. Ismagilov, *eLife* 8, e40387 (2019)
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
26. Polymers in the gut compress the colonic mucus hydrogel
S. S. Datta, A. Preska Steinberg, and R. F. Ismagilov, *PNAS* 113, 7041 (2016)
Relevant research areas: [Active and living matter](#), [Soft mechanics](#), [Complex fluids](#)
25. Individually addressable arrays of replica microbial cultures enabled by splitting SlipChips
L. Ma, S. S. Datta, M. Karymov, Q. Pan, S. Begolo, and R. F. Ismagilov, *Integrative Biology* 6, 796 (2014)
Relevant research areas: [Active and living matter](#)
24. Breakup of fluids in steady-state two-phase flow through a porous medium
S. S. Datta, J. B. Dupin, and D. A. Weitz, *Physics of Fluids* 26, 062004 (2014)
Relevant research areas: [Flow in porous media](#)
Highlighted in the textbook "Multiphase Flow in Permeable Media: A Pore-Scale Perspective" by M. J. Blunt
23. Mobilization of a trapped non-wetting fluid from a three-dimensional porous medium
S. S. Datta, T. S. Ramakrishnan, and D. A. Weitz, *Physics of Fluids* 26, 022002 (2014)
Relevant research areas: [Flow in porous media](#)
Highlighted in the textbook "Multiphase Flow in Permeable Media: A Pore-Scale Perspective" by M. J. Blunt
22. Double emulsion templated solid microcapsules: mechanics and controlled release
S. S. Datta†, A. Abbaspourrad†, E. Amstad, J. Fan, S. H. Kim, M. Romanowsky, H. C. Shum, B. Sun, A. S. Utada, M. Windbergs, S. Zhou, and D. A. Weitz, *Advanced Materials* 26, 2205 (2014)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
21. The microfluidic post-array device: high throughput production of single emulsion drops
E. Amstad, S. S. Datta, and D. A. Weitz, *Lab on a Chip* 14, 705 (2014)
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
20. Controlling the morphology of polyurea microcapsules using microfluidics
I. Polenz, S. S. Datta, and D. A. Weitz, *Langmuir* 30, 13405 (2014)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
19. Spatial fluctuations of fluid velocities in flow through a three-dimensional porous medium
S. S. Datta, H. Chiang+, T. S. Ramakrishnan, and D. A. Weitz, *Physical Review Letters* 111, 064501 (2013)
Relevant research areas: [Flow in porous media](#)
18. Drainage in a model stratified porous medium
S. S. Datta and D. A. Weitz, *EPL* 101, 14002 (2013)
Relevant research areas: [Flow in porous media](#)
17. Visualizing multiphase flow and trapped fluid configurations in a model three-dimensional porous medium
A. T. Krummelt†, S. S. Datta†, S. Munster, and D. A. Weitz, *AIChE Journal* 59, 1022 (2013)
Relevant research areas: [Flow in porous media](#)

16. Expansion and rupture of charged microcapsules
S. S. Dattat, A. Abbaspourrad†, and D. A. Weitz, *Materials Horizons* 1, 92 (2013)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
15. Controlling release from pH-responsive microcapsules
A. Abbaspourrad†, S. S. Dattat, and D. A. Weitz, *Langmuir* 29, 12697(2013)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
14. Microfluidic fabrication of stable gas-filled microcapsules for acoustic contrast enhancement
A. Abbaspourrad†, W. J. Duncanson†, N. Lebedeva, S. H. Kim, A. Zhushma, S. S. Datta, S. S. Sheiko, M. Rubinstein, and D. A. Weitz, *Langmuir* 29, 12352 (2013)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
13. Ultrathin shell double emulsion-templated giant unilamellar lipid vesicles with controlled microdomain formation
L. R. Arriaga, S. S. Datta, S. H. Kim, E. Amstad, F. Monroy, and D. A. Weitz, *Small* 10, 950 (2013)
Relevant research areas: [Complex fluids](#)
12. Thermally switched release from nanoparticle colloidosomes
S. Zhu†, J. Fan†, S. S. Datta, X. Guo, M. Guo, and D. A. Weitz, *Advanced Functional Materials* 23, 5925 (2013)
Relevant research areas: [Complex fluids](#)
11. Delayed buckling and guided folding of inhomogeneous capsules
S. S. Dattat, S-H Kim†, J. Pauloset, A. Abbaspourrad, D. R. Nelson, and D. A. Weitz, *Physical Review Letters* 109, 134302 (2012)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#), [Flow in porous media](#)
10. Rheology of attractive emulsions
S. S. Datta, D. D. Gerrard+, T. S. Rhodes+, T. G. Mason, and D. A. Weitz, *Physical Review E* 84, 041404 (2011)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#)
9. Controlled buckling and crumpling of nanoparticle-coated droplets
S. S. Datta, H. C. Shum, D. A. Weitz, *Langmuir*, 26, 18612 (2010)
Relevant research areas: [Soft mechanics](#), [Complex fluids](#), [Nanoscience](#)
8. Wetting and energetics in nanoparticle etching of graphene
S. S. Datta, *Journal of Applied Physics* 108, 024307 (2010)
Relevant research areas: [Nanoscience](#), [Complex fluids](#)
7. Gate coupling to nanoscale electronics
S. S. Datta, D. R. Strachan, A. T. Johnson, *Physical Review B* 79, 205404 (2009)
Relevant research areas: [Nanoscience](#), [Complex fluids](#)
6. Crystallographic etching of few-layer graphene
S. S. Datta, D. R. Strachan, S. M. Khamis, A. T. Johnson, *Nano Letters* 8, 1912 (2008)
Relevant research areas: [Nanoscience](#)
5. Surface potentials and layer charge distributions in few-layer graphene films
S. S. Datta, D. R. Strachan, E. J. Mele, A. T. Johnson, *Nano Letters* 9, 7 (2009)
Relevant research areas: [Nanoscience](#)

4. Real-time TEM imaging of the formation of crystalline nanoscale gaps
D. R. Strachan, D. E. Johnston, B. S. Guiton, S. S. Datta, P. K. Davies, D. A. Bonnell, A. T. Johnson, *Physical Review Letters* 100, 056805 (2008)
Relevant research areas: Nanoscience
3. Electrostatic force microscopy of nanofibers and carbon nanotubes:
Quantitative analysis using theory and experiment
S. S. Datta, C. Staii, N. J. Pinto, D. R. Strachan, A. T. Johnson, *MRS Proceedings* 1025-B13-03 (2007)
Relevant research areas: Nanoscience
2. Functionalized carbon nanotubes for detecting viral proteins
Y-B Zhang, M. Kanungo, A. J. Ho, P. Freimuth, D. van der Lelie, M. Chen, S. M. Khamis, S. S. Datta, A. T. Johnson, B. Panessa-Warren, J. A. Misewich, S. S. Wong, *Nano Letters* 7, 3086 (2007)
Relevant research areas: Nanoscience
1. Detection of viral proteins using human receptor functionalized carbon nanotubes
M. Chen, S. M. Khamis, S. S. Datta, Y-B Zhang, M. Kanungo, A. J. Ho, P. Freimuth, D. van der Lelie, A. T. Johnson, J. A. Misewich, S. S. Wong, *MRS Proceedings* 1065-QQ04-05 (2007)
Relevant research areas: Nanoscience

Intellectual Property

Work from Princeton – 6 total:

8. Method to 3D-Print Engineered Living Materials,
S. S. Datta, R. D. Priestley, X. Xu, R. K. Bay, US Provisional Application Filed on 11/4/21
7. Method to Homogenize Flow and Heat/Mass Transport
in Heterogeneous Porous Media Using Polymeric Additives,
S. S. Datta, C. A. Browne, R. Huang, and C. Zheng, US Provisional Application Filed on 10/26/21
6. SHApE RElaxation (SHARE): A method to characterize
the poroelastic properties of swellable soft materials,
S. S. Datta and J-F Louf, US Provisional Application Filed on 01/04/21
5. Hand Sanitizer Gels from Sustainable Resources for Various Skin Types,
R. D. Priestley, S. S. Datta, and N. Bizmark, US Provisional Application Filed on 10/02/20
4. Bacteria in 3D porous media, S. S. Datta and T. Bhattacharjee,
US Patent Application Filed on 4/28/20 (PCT Application number PCT/US/2020/030213)
3. Controlling immiscible fluid displacement in porous media using controlled colloid or solute deposition,
S. S. Datta, N. B. Lu, J. Schneider, C. A. Browne, D. B. Amchin, and N. Bizmark,
US Provisional Application Filed on 07/03/19

Work Conducted Prior To Princeton – 2 total:

2. Polymeric compositions and related systems and methods for regulating biological hydrogels,
R. F. Ismagilov, S. S. Datta, A. Preska Steinberg, S. R. Bogatyrev,
US Patent Application Filed on 1/5/17 (PCT Application number PCT/US2017/012398)
1. Atomically precise nanoribbons and related methods,
S. S. Datta, D. R. Strachan, S. M. Khamis, A. T. Johnson, Y. Dan,
US Patent Application Filed on 6/1/09 (US Application Number 12/995,562)

Invited Talks While at Princeton

100. Spring 2023: MIT, Biological Engineering, Cambridge MA
99. Spring 2023: U Mass Amherst, Physics and Astronomy, Amherst MA
98. Spring 2023: MIT, Chemical Engineering, Cambridge MA
97. Spring 2023: University of Delaware, Chemical and Biomolecular Engineering, Newark DE
96. Spring 2023: Arizona State University, Biological Physics, Tempe AZ
95. Spring 2023: Northwestern University, Science for Protection of Engineered Environments, Evanston IL
94. January 2023: Gordon Research Conference on
Complex Active and Adaptive Material Systems, Ventura CA
93. January 2023: UCSF, Biophysics/Bioinformatics/Chemistry and Chemical Biology, San Francisco CA
92. Fall 2022: University of Southern California, Physics and Astronomy, Los Angeles CA
91. Fall 2022: Gordon Research Conference on Colloidal, Macromolecular,
and Polyelectrolyte Solutions, Ventura CA
90. Fall 2022: Stanford University, Chemical Engineering, Stanford CA
89. Fall 2022: 3rd International Workshop on Stochasticity and Fluctuations in Small Systems, Pohang Korea
88. Fall 2022: University of Minnesota, Chemical Engineering and Materials Science, Minneapolis MN
87. Fall 2022: Bucknell University, Physics and Astronomy, Lewisburg PA
86. Fall 2022: "Viscoelastic flow instabilities in porous media",
University of Houston, Mechanical Engineering, Houston TX
85. July 2022: "Viscoelastic flow instabilities in porous media", SIAM Annual Meeting,
Stability and Modeling in Non-Newtonian Flows mini-symposium, Pittsburgh PA (virtual)
84. July 2022: "Life in a tight spot: How bacteria spread in porous media",
SIAM Conference on the Life Sciences, Pittsburgh PA (virtual)
83. June 2022: "Viscoelastic flow instabilities in porous media",
U.S. National Congress of Theoretical and Applied Mechanics meeting, Austin TX
82. June 2022: "Life in a tight spot: How bacteria spread in porous media",
InterPore Annual Meeting, Abu Dhabi, UAE
81. May 2022: "On growth and form of microbial colonies", Mechanics of Life workshop,
Flatiron Institute, New York NY
80. May 2022: "Life in a tight spot: How bacteria spread in crowded spaces",
Center for Computational Biology Colloquium, Flatiron Institute, New York NY
79. May 2022: "Life in a tight spot: How bacteria spread in crowded spaces",
MIT, Mechanics—Modeling, Experimentation, & Computation Seminar, Cambridge MA
78. May 2022: "In a tight spot: Visualizing complex fluid flows in 3D porous media",
ExxonMobil Research and Engineering, Clinton NJ (virtual).
77. April 2022: "Viscoelastic polymer flows in 3D porous media", Spring Meeting of the Korean Physical Society,
Pioneer Symposium on Nano-Rheology and Physics of Complex Fluids (virtual).

76. March 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
UCSB, Chemical Engineering, Santa Barbara CA
75. February 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
Georgia Institute of Technology, Chemical and Biomolecular Engineering, Atlanta GA
74. February 2022: "Life in a tight spot: How bacteria move in crowded spaces",
Best of *Biophysical Journal*: Molecules to Health symposium,
Biophysical Society 66th Annual Meeting, San Francisco CA
73. February 2022: "Viscoelastic polymer flows in 3D porous media", Cornell University,
Cornell Fluids Seminar, Ithaca NY (virtual)
72. February 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
UC Berkeley, Chemical and Biomolecular Engineering, Berkeley CA
71. January 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
Florida A&M University – Florida State University,
Chemical and Biomedical Engineering, Tallahassee FL
70. January 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
Northwestern University, Engineering Sciences and Applied Mathematics,
Complex Systems, Center for Computation & Theory of Soft Materials, Evanston IL
69. January 2022: "Life in a tight spot: How bacteria behave in crowded spaces",
California Institute of Technology, Chemistry and Chemical Engineering, Pasadena CA
68. January 2022: "Viscoelastic polymer flows in 3D porous media", The Dow Chemical Company (virtual)
67. December 2021: "Life in a tight spot: How bacteria behave in crowded spaces", TU Delft,
Chemical Engineering, Delft, Netherlands (virtual)
66. December 2021: "Life in a tight spot: How bacteria behave in crowded spaces", NYU,
Courant Institute of Mathematical Sciences, Applied Math Seminar, New York NY
65. November 2021: "Life in a tight spot: How bacteria behave in crowded spaces", University of Toronto,
Chemical Engineering and Applied Chemistry, Toronto Canada (virtual)
64. October 2021: "Viscoelastic polymer flooding and flow instabilities in 3D porous media",
Argentinean Physics Association Annual Meeting (virtual)
63. October 2021: "In a tight spot: *In situ* dynamics of gels in porous media",
5th international EOR conference, Chongqing, China (virtual)
62. October 2021: "Life in a tight spot: How bacteria behave in crowded spaces",
University of Michigan, Chemical Engineering, Ann Arbor MI
61. September 2021: "Life in a tight spot: How bacteria behave in crowded spaces",
Leiden University, Institute of Physics, Netherlands (virtual)
60. September 2021: "In a tight spot: *In situ* dynamics of soft matter in porous media",
Kimberly-Clark Corporation, Horizons keynote lecture (virtual)
59. September 2021: "Life in a tight spot: How bacteria behave in crowded spaces",
University of Pennsylvania, Condensed and Living Matter seminar, Philadelphia PA (virtual)

58. August 2021: "Viscoelastic polymer flooding and flow instabilities in 3D porous media", InterPore Brazil Annual Meeting (virtual)
57. July 2021: "Life in a tight spot: How bacteria move in porous media", 5th Summer School on Flow and Transport in porous & fractured media, Cargèse France (virtual)
56. July 2021: "Viscoelastic polymer flooding and flow instabilities in 3D porous media", TU Delft/Heriot-Wyatt GeoScience & GeoEnergy Webinar (virtual)
55. June 2021: "Using complex fluids to get trapped droplets out of a tight spot", ACS Colloid and Surface Science Symposium (virtual)
54. June 2021: "Life in a tight spot: How bacteria move in crowded spaces", ACS Colloid and Surface Science Symposium (virtual)
53. June 2021: "Elastic turbulence in porous media", 20th International Workshop on Numerical Methods in Non-Newtonian Flows (virtual)
52. May 2021: "In a tight spot: *In situ* dynamics of soft matter in porous media", UCLA, Civil and Environmental Engineering, Los Angeles CA (virtual)
51. May 2021: "Life in a tight spot: How bacteria swim in complex spaces", ETH Zurich, Soft Materials Lecture, Zurich Switzerland (virtual)
50. April 2021: "Viscoelastic polymer flooding in 3D porous media", MES2021 International Microfluidics and Energy Symposium (virtual)
49. April 2021: "Life in a tight spot: How bacteria swim in complex spaces", PoreLab Lecture Series, Norwegian University of Science and Technology / University of Oslo, Norway (virtual)
48. April 2021: "Life in a tight spot: How bacteria swim in complex spaces", UCSD, Fluid Mechanics Seminar, San Diego CA (virtual)
47. April 2021: "Life in a tight spot: How bacteria swim in complex spaces", The Stanley Corrsin Memorial Lecture in Fluid Mechanics, Johns Hopkins University, Chemical and Biomolecular Engineering, Baltimore MD (virtual)
46. March 2021: "Life in a tight spot: How bacteria move in porous media", University of Pennsylvania, Chemical and Biomolecular Engineering, Philadelphia PA (virtual)
45. March 2021: "Life in a tight spot: How bacteria move in porous media", German Physical Society (DPG) Annual Meeting (virtual)
44. March 2021: "Patches of patches: Elastic turbulence in porous media", APS March Meeting (virtual)
43. February 2021: "Life in a tight spot: How bacteria move in heterogeneous media", University of Rhode Island, Chemical Engineering, Kingston RI (virtual)
42. January 2021: "Life in a tight spot: How bacteria move in heterogeneous media", Rice University, Center for Theoretical Biological Physics, Houston TX (virtual)
41. December 2020: "Life in a tight spot: How bacteria move in heterogeneous media", SEG/SPWLA Workshop on Porous Media: Structure, Flow and Dynamics, Beijing China (virtual)
40. December 2020: "Life in a tight spot: How bacteria move in heterogeneous media", Brown University, Center for Fluid Mechanics, Providence RI (virtual)

39. November 2020: "Patches of patches: Elastic turbulence in porous media",
Journal of Non-Newtonian Fluid Mechanics Virtual Seminar Series (virtual)
38. November 2020: "Life in a tight spot: How bacteria move in heterogeneous media",
AIChE Annual Meeting, Plenary lecture (virtual)
37. October 2020: "Life in a tight spot: How bacteria move in heterogeneous media",
University of Illinois, Materials Science and Engineering, Urbana-Champaign IL (virtual)
36. October 2020: "Life in a tight spot: How bacteria move in heterogeneous media",
Rice University, Chemical and Biomolecular Engineering, Houston TX (virtual)
35. October 2020: "Patches of patches: Elastic turbulence in porous media",
Okinawa Institute of Science and Technology, Okinawa Japan (virtual)
34. October 2020: "Life in a tight spot: How bacteria move in heterogeneous media",
Yale University, Chemical and Environmental Engineering, New Haven CT (virtual)
33. September 2020: "Life in a tight spot: How bacteria move in heterogeneous media",
California Institute of Technology, Frontiers of Chemical Engineering Symposium, Pasadena CA (virtual)
32. September 2020: "Life in a tight spot: Bacterial motility in heterogeneous media",
Rockefeller University, Center for Studies in Physics and Biology, New York NY (virtual)
31. September 2020: "Patches of patches: Elastic turbulence in porous media",
University of Virginia, Mechanical and Aerospace Engineering, Charlottesville VA (virtual)
30. September 2020: "Life in a tight spot: Bacterial motility in heterogeneous media",
Technion-Israel Institute of Technology, Physics, Haifa Israel (virtual)
29. August 2020: "Life in a tight spot: Bacterial motility in heterogeneous media"
BPPB Virtual Biological Physics/Physical Biology Seminar Series (virtual)
- 28 July 2020: "Heterogeneous Dynamics in Porous Media: from Gels to Cells"
Unilever Research & Development (virtual)
27. June 2020: "Life in a tight spot: How bacteria move in heterogeneous media"
Princeton Center for the Physics of Biological Function Summer School (virtual)
26. June 2020: "Life in a tight spot: Transport and collective behavior of bacteria in heterogeneous media"
ACS Colloids and Surface Science Symposium, Keynote lecture (virtual)
25. February 2020: "Life in a tight spot: Bacterial motility in porous media",
Yale University, Quantitative Biology Institute, New Haven CT
24. December 2019: "Heterogeneous Dynamics in Porous Media: from Gels to Cells",
New York University, Center for Soft Matter Research, New York NY
23. November 2019: "Cracking and self-healing of shrinkable granular media",
SPWLA Porous Media: Structure, Flow, and Dynamics workshop, Cambridge MA
22. October 2019: "Heterogeneous Dynamics in Porous Media: from Gels to Cells",
MIT Soft Materials Structures and Devices Seminar, Cambridge MA
21. October 2019: "Heterogeneous Dynamics in Porous Media: from Gels to Cells",
Cornell University, Chemical and Biomolecular Engineering, Ithaca NY

20. October 2019: "In a tight spot: Heterogeneous Transport in Porous Media", Annual Meeting of the Society of Engineering Science, St Louis WA
19. September 2019: "Heterogeneous Dynamics in Porous Media: from Gels to Cells", Levich Institute for Physico-Chemical Hydrodynamics, CCNY, New York NY
18. May 2019: "Bacterial Hopping and Trapping in Porous Media", 16th Annual Conference on Frontiers in Applied and Computational Mathematics, Newark NJ
17. May 2019: "Heterogeneous dynamics of cells and gels in complex spaces", MIT Physical Mathematics Seminar, Cambridge MA
16. May 2019: "Desiccation cracking of shrinkable granular media", MIT "Clays, New Perspectives, Challenges & Opportunities" workshop, Cambridge MA
15. April 2019: "Dynamics of cells and gels in complex spaces", Tufts University, Physics, Somerville MA
14. April 2019: "Dynamics of cells and gels in complex spaces", University of Virginia, Chemical Engineering, Charlottesville VA
13. April 2019: "Heterogeneous dynamics of cells and gels in complex spaces", New Jersey Institute of Technology, Chemical and Materials Engineering, Newark NJ
12. March 2019: "All Stressed Out: Cracking and Self-Healing of Shrinkable Granular Packings", APS March Meeting, Boston MA
11. November 2018: "Getting Out of a Tight Spot: Heterogeneous Transport in Porous Media", George Washington University, Mechanical and Aerospace Engineering, Washington DC
10. November 2018: "Stressing cells and gels: exploiting gradients in two different systems", University of Maryland, Biophysics Seminar, College Park MD
9. October 2018: "Life in a tight spot: bacterial communities in 3D porous media", University of Florida Soft Matter Symposium, Gainesville FL
8. August 2018: "Stressing Gels Out", Mid-Atlantic Soft Matter Workshop, Georgetown University, Washington DC
7. July 2018: "Stressing Gels Out", Complex Fluids in Biological Systems workshop, Banff International Research Station for Mathematical Innovation and Discovery
6. July 2018: "Stressing Gels Out", Gordon Research Conference on Flow/Transport in Permeable Media
5. April 2018: "Getting Out of a Tight Spot: Heterogeneous Transport in Porous Media", City College of New York, Mechanical Engineering, New York NY
4. April 2018: "Getting Out of a Tight Spot: Heterogeneous Transport in Porous Media", Princeton University, Mechanical and Aerospace Engineering, Princeton NJ
3. January 2018: "Soft materials in complex environments: from porous rocks to the gut", University of Pennsylvania, Physics, Philadelphia PA
2. January 2018: "Soft materials in complex environments: from porous rocks to the gut", 8th Northeast Complex Fluids and Soft Matter Workshop, New York NY
1. October 2017: "Complex fluids in the gut", Keynote lecture at AIChE Annual Meeting, Minneapolis MN

Mentoring at Princeton

Current postdoctoral researchers

- September 2022-present: Victoria Muir (PhD, University of Pennsylvania)
- August 2022-present: Nikhil Subraveti (PhD, University of Maryland; co-advised with Bob Prud'homme)
- June 2022-present: Meera Ramaswamy (PhD, Cornell)
- February 2022-present: Babak Vajdi Hokmabad (PhD, Max Planck Institute for Dynamics and Self-organization, Göttingen Germany)
- September 2021-present: Alejandro Martinez-Calvo (PhD, Universidad Carlos III de Madrid; co-advised with Ned Wingreen)
- September 2021-present: Carolina Trenado Yuste (PhD, Universidad Carlos III de Madrid; co-advised with Celeste Nelson and Ned Wingreen)
- September 2021-present: Hongbo Zhao (PhD, MIT; co-advised with Andrej Košmrlj and Cliff Brangwynne)
- May 2018-present: Navid Bizmark (PhD, U. Waterloo; co-advised with Rod Priestley and Bob Prud'homme)

Former postdoctoral researchers

- July 2020-June 2022: R. Konane Bay (PhD, U. Massachusetts Amherst), went on to next position as an Assistant Professor at CU Boulder
- June 2019-July 2021: Jean-François Louf (PhD, Aix-Marseille University, France), went on to next position as an Assistant Professor at Auburn University
- June 2018-June 2021: Tapomoy Bhattacharjee (PhD, U. of Florida), went on to next position as an Assistant Professor at The National Centre for Biological Sciences, India
- April 2018-July 2018: Maziar Derakhshandeh (PhD, U. of British Columbia), went on to next position as a Scientist at Mondelez International, Inc.
- October 2017-June 2019: Jeremy Cho (PhD, MIT), went on to next position as an Assistant Professor at the University of Nevada, Las Vegas

Current graduate students

- January 2022-present: Emily Chen (PhD candidate, CBE)
- January 2021-present: Anna Hancock (PhD candidate, CBE)
- December 2020-present: Sebastian Gonzalez La Corte (PhD candidate, QCB; co-advised by Ned Wingreen)
- January 2019-present: Jenna Ott (PhD candidate in CBE)
- January 2019-present: Joanna Schneider (PhD candidate, CBE; co-advised by Rodney Priestley)

Former graduate students

- January 2018-May 2022: Daniel Amchin (PhD in CBE), graduated May 2022, went on to next position as a Postdoctoral Researcher in Advanced Technology at Johnson & Johnson
- January 2018-May 2022: Christopher Browne (PhD in CBE), graduated May 2022, went on to next position as a Postdoctoral Researcher at UCSB, advised by Zvonimir Dogic
- September 2019-May 2021: Galen Mandes (MSE in CBE co-advised with Sankaran Sundaresan), went on to next position as an Instructor at the United States Military Academy, West Point
- April 2017-April 2021: Nancy Lu (PhD in CBE); graduated April 2021, went on to next position as a Management Consultant at Qral Group

Current undergraduate student researchers

- September 2022-present: Amina Anowara (CBE, Independent research)
- June 2022-present: Ariana Di Landro (CBE, OURSIP program, Independent research)
- January 2022 -present: Arabella Dill-Macky (CBE, Independent research, Senior thesis)
- June 2021-present: Yaxin Duan (CBE, HMEI Environmental Scholars Program, Independent research)
- September 2021-present: Hao Nghi Luu (CBE, Independent research, Senior thesis)

Former undergraduate student researchers

- June-August 2021: Kylie Cyhn (CBE, OURSIP program)
- September 2021-May 2022: Brianna Royer (CBE, Senior thesis), went on to next position as an MEng student in Chemical and Biological Engineering at Princeton
- September 2020-May 2022: Selena Chiu (CBE, Independent research, Stoll summer fellowship, Senior thesis), went on to next position as a PhD student in Chemical Engineering at Stanford
- June 2021-June 2022: Caroline Adkins (CEE, HMEI summer internship, Senior thesis), went on to next position as a PhD student in Civil and Environmental Engineering at Stanford
- June 2020-May 2021, September-May 2022: Richard Huang (CBE, ReMatch program, Independent research)
- June-December 2021: Cecilia Quirk (ORFE, ReMatch+ program, Independent research)
- Summer 2019-May 2020, September 2021-May 2022: Kimberly Lu (CBE, OURSIP program, Senior thesis)
- June-August 2021: Callie Zheng (CBE, Andlinger summer internship)
- February-May 2021: Malcolm Slutzky (Physics, Independent research)
- September 2020-May 2021: MaryKate Neff (CBE, Senior thesis), went on to next position as a Master's student at Duke University in Management Studies
- June 2020-January 2021: Cristian Arens (CBE, Independent research, Reiner G. Stoll summer fellowship)
- June-August 2020: Kevin Yeung (CBE, ReMatch+ program)
- September 2018-May 2020: Audrey Shih (CBE, Independent research, Senior thesis, Andlinger summer internship), went on to next position as a PhD student in Chemical Engineering at Stanford
- February 2018-May 2020: Maggie O'Connell (CBE, ReMatch+ program, Independent research, Senior thesis), went on to next position as a PhD student in Chemical Engineering at Northwestern
- Fall 2019-May 2020: Glenda Chen (CBE, Senior thesis), went on to next position as a High Meadows Fellow at the Environmental Defense Fund
- September 2018-May 2019: Emily de Jong (CBE, Senior thesis), went on to next position as a PhD student in Mechanical Engineering at Caltech
- September-May 2018: Emmanuel Mintah (CBE, Independent research)
- Summer 2018: Rebekah Adams (CBE, ReMatch+ program)
- Summer 2018: Shalaka Madge (CBE, OURSIP program)
- September 2017-May 2019: Rhea Braun (CBE, Independent research, Senior thesis), went on to next position as a CBE PhD student at the University of Virginia
- September 2017-May 2018: Florence Odigie (CBE, Independent research), went on to next position as a Management Associate at Con Edison

- August 2017-May 2018: Nathanael Ji (CBE, Senior thesis), went on to next position as a Software Engineer at Capital One

Visiting student researchers

- Summer 2018, Fall 2019: Nadine Ziegler (PhD student, RU Bochum, REACH & PR.INT programs), went on to next position in R&D at Dillinger
- Summer 2019: Felix Kratz (MS student, TU Dortmund, REACH program)
- Summer 2018: Anvitha Sudhakar (Visiting Undergraduate from IIT Bombay, ISIP program), went on to next position as a PhD student in MAE at Princeton

Teaching at Princeton

- Fall 2022: CBE 507 – *Graduate seminar: Research Topics in Chemical & Biological Engineering*
- Fall 2022: CBE 430 – *Squishy Engineering: Using Soft Materials to Solve Hard Problems*
- Spring 2022: CBE 346 – *Chemical & Biological Engineering Lab* (with 4 other instructors); 25 students
Instructor-specific lecture quality rating: 4.29/5; Overall course rating: 3.37/5;
Evaluations noted that “Prof Datta was the silver lining of this course and [...] cared about his students and their wellbeing. His enthusiasm was infectious and students working with him in investigations were excited to make him proud[...] It was clear that he cared a lot about his students learning the material well.”
- Fall 2021: CBE 430 – *Squishy Engineering: Using Soft Materials to Solve Hard Problems*; 39 students
Instructor-specific lecture quality rating: 4.72/5; Overall course rating: 4.81/5;
Evaluated as “amazing” and “this is the best course I have taken at Princeton... It reminded me that it is supposed to be fun and interesting to be an engineer.”
- Spring 2021: CBE 346 – *Chemical & Biological Engineering Lab* (virtual with 4 other instructors); 34 students
Instructor-specific lecture quality rating: 3.85/5; Overall course rating: 2.58/5;
Lectures evaluated as “really helpful”
- Fall 2020: CBE 503 – *Graduate-Level Advanced Thermodynamics* (virtual); 21 students
Instructor-specific lecture quality rating: 4.42/5; Overall course rating: 4.33/5;
Evaluated as “amazing”, “WOW”
- Spring 2020: CBE 430 – *Squishy Engineering: Using Soft Materials to Solve Hard Problems*; 27 students
Instructor-specific lecture quality rating: 4.95/5; Overall course rating: 4.84/5;
Evaluated as “amazing”, “one of the best professors I've had”, and “a course that you should definitely take”
- Fall 2019: CBE 503 – *Graduate-Level Advanced Thermodynamics*; 23 students
Instructor-specific lecture quality rating: 4.64/5; Overall course rating: 4.43/5;
Evaluated as “best lectures I have ever had”
- Fall 2018: CBE 503 – *Graduate-Level Advanced Thermodynamics*; 22 students
Instructor-specific lecture quality rating: 4.58/5; Overall course rating: 4.47/5;
Evaluated as “probably the best lecture I had the entire semester”
- Fall 2017: CBE 503 – *Graduate-Level Advanced Thermodynamics*; 17 students
Instructor-specific lecture quality rating: 4.57/5; Overall course rating: 4.64/5;
Evaluated as “amazing”.

Professional Activities and Service

Referee for journals

Nature, Science, Science Advances, Proceedings of the National Academy of Sciences, Nature Communications, Physical Review Letters, Soft Matter, Advanced Materials, Angewandte Chemie, Journal of the American Chemical Society, Journal of Fluid Mechanics, AIChE Journal, Langmuir, ChemPhysChem, Microfluidics and Nanofluidics, ACS Applied Materials and Interfaces, Physical Review Materials, Physical Review Applied, Biophysical Journal, Advances in Water Resources, Journal of Membrane Science, eLife, Biotechnology and Bioengineering, Applied Physics Letters, Lab on a Chip, Physical Review Fluids, Critical Reviews in Environmental Science and Technology, Physical Review E, Accounts of Chemical Research, Water Resources Research, Journal of Physical Chemistry Letters, Energy and Fuels, Journal of Non-Newtonian Fluid Mechanics, Geophysical Review Letters, Environmental Science and Technology, Science of the Total Environment, International Journal of Multiphase Flow, Journal of Rheology, Physics of Fluids, Transport in Porous Media, Macromolecules

Organizer/co-organizer of sessions at scientific meetings

- "Geochemical and Environmental Systems" session, ACS Colloid & Surface Science Symposium, 2022
- "Innovative Methods for Characterization, Monitoring, and In-Situ Remediation of Contaminated Soils and Aquifers" minisymposium, InterPore Meeting, 2022
- "Deformation and assembly of materials and structures at solid-liquid interfaces" mini-symposium, U.S. National Committee on Theoretical and Applied Mechanics, 2022
- "Biological active matter" focus session, APS March Meeting, 2022
- "Active matter in complex environments" focus session, APS March Meeting, 2020, 2021, 2022
- "Soft materials in disordered environments" focus session, APS March Meeting, 2019
- "Polymer-mediated structural transitions in soft materials" focus session, APS March Meeting, 2019
- "Swelling and shrinking porous media" focus session, InterPore Meeting, 2019
- "Complex Fluid Flows in Porous Media" focus session, APS Fluid Dynamics Meeting, 2018

Chair/co-chair of sessions at scientific meetings

- "Rheology of living and active systems" session, International Congress on Rheology, 2023
- "Rheology of soil, mud and construction materials" session, Society of Rheology, 2022
- "Biological active matter" focus session, APS March Meeting, 2022
- "Active Matter in Complex Environments" focus session, APS March Meeting, 2020, 2021, 2022
- "Soft and Active Systems" session, AIChE Meeting, 2021
- "Complex Fluids" session, AIChE Meeting, 2021
- "Technologies for Understanding Microbial Interactions" session, AIChE Meeting, 2021
- "Fundamentals of Interfacial Phenomena" session, AIChE Meeting, 2020, 2021
- "Active and Biological Materials" sessions, Society of Rheology, 2021
- "Microbial Interactions with Biomaterials and Host Cells" session, AIChE Meeting, 2020
- "Microfluidic and Microscale Flows" session, AIChE Meeting, 2020
- "Microfluidic and Confined Flows" session, Society of Rheology Meeting, 2019
- "Microfluidic and Nanoscale Flows" session, AIChE Meeting, 2019
- "Jamming/Gelation/Rheology" session, ACS Colloids and Surfaces Symposium, 2019

- "Novel Complex Flows" session, AIChE Meeting, 2018
- "Drops and Bubbles" session, APS March Meeting, 2018
- "Complex Fluids: Macromolecules" session, AIChE Meeting, 2017
- "Complex Fluids: Self & Directed Assembly" session, AIChE Meeting, 2017

Committees of professional societies

- Selection committee, American Physical Society Apker Prize, 2018-2021
- AIChE Area 1J Fluid Mechanics Programming Committee, 2021-2026

Grant proposal reviewer

- Army Research Office, 2022
- French National Research Agency, 2022
- Foundation for Polish Science, 2022
- Natural Sciences and Engineering Research Council of Canada (NSERC), 2021
- National Science Center, Poland, 2021
- NSF Division of Earth Sciences, 2021
- NSF Understanding the Rules of Life panel, 2021
- ACS Petroleum Research Fund, 2019, 2020, 2021
- Human Frontier Science Program (HFSP), 2020
- NSF CMMI Biomechanics and Mechanobiology program, 2020
- University of Wisconsin Water Resources Institute (WRI), 2020
- New Jersey Alliance for Clinical and Translational Research (NJACTS), 2020
- German Research Foundation (DFG), 2019
- Netherlands Organization for Scientific Research (NWO), Applied and Engineering Sciences, 2019
- DOE Office of Basic Energy Sciences, Separation Science program, 2018
- NSF CBET Fluid Dynamics panel, 2018
- French National Research Agency (Pathophysiology), 2017

External Thesis Committees

- 2022: San To Chan (PhD student at Okinawa Institute of Science and Technology); advisor Amy Shen
- 2022: Haohui Zhang, Mechanical Engineering (PhD student at Georgia Tech); advisor Yuhang Hu
- 2021: Yasser Almoteri, Mathematical Sciences (PhD student at NJIT); advisor Enkeleida Lushi
- 2021: Shuaijun Li, Mechanical Engineering (PhD at CCNY); advisor Jing Fan

Other Professional Activities and Service

- Lead organizer, *Active Matter in Complex Environments* Winter Conference, Aspen Center for Physics, 2023
- Guest Editor, *Frontiers in Physics*, special issue on "Active Matter in Complex Environments", 2021-2022
- Review Editor, *Frontiers in Soft Matter*, Biological Soft Matter, 2021-onward

Service at Princeton

Chemical and Biological Engineering Department

- Director of Graduate Studies, July 2022-onward
- Member, Target of Opportunity / senior faculty search committee, September 2020-present
- Sophomore advising, September 2019-May 2020, Fall 2022-Spring 2023
- Departmental seminar organizer, Fall 2018, Spring 2022
- Junior advising, September 2020-Spring 2022
- Graduate affairs and admissions committee, Academic Year 2017-2018, 2018-2019
- Junior faculty search committee, Academic Year 2017-2018, 2019-2020
- Website committee, Academic Year 2017-2018

School of Engineering and Applied Science

- Member, SEAS Innovation Grant review committee, Fall 2018, Spring 2022
- Member, Executive Committee, Materials Science & Engineering Program, July 2019-June 2024
- Member, Executive Committee, Engineering Physics Program, July 2019-June 2023
- BSE freshman advising, September 2018-May 2022
- PRISM/PCCM seminar organizer, Spring 2019, Fall 2021, Spring 2022
- Member, SEAS BioEngineering faculty search committee, May 2020-May 2021
- Energy storage working group, Andlinger Center for Energy and the Environment, Summer 2019
- Member, Andlinger Center Grant Proposal review committee, Spring 2019
- Member, Andlinger Center Distinguished Postdoctoral Fellow selection committee, Fall 2018

University

- Co-Leader, Interdisciplinary Research Group on Soft & Living Matter, Princeton Center for Complex Materials (a Materials Research Science and Engineering Center, MRSEC), July 2022-present
- Member, Graduate School Curriculum Committee, July 2022-June 2023
- Member, CPUC Executive Committee / Faculty Advisory Committee on Policy, July 2022-June 2023
- Member, Council of the Princeton University Community (CPUC), July 2022-June 2025
- Member, Faculty Committee on the Graduate School, July 2022-onward
- Member, Mary and Randall Hack '69 Graduate Award for Water and the Environment review committee, Spring 2022
- Member, University Committee on the Library and Computing, July 2019-June 2022
- Member, Executive Committee for the Program in Technology & Society, July 2018-July 2021

Thesis Committees

- 2022: Emily Wei-Hsin Sun, CEE (PhD student); advisor Ian Bourg
- 2022: Binglun Shao, CBE (Undergraduate senior thesis student); advisor Stas Shvartsman
- 2021-present: Satyen Dhamankar, CBE (PhD student); advisor Michael Webb
- 2021-present: Emily Ferguson, CBE (PhD student); advisor Emily Davidson
- 2021: Lingzhi Cai, CBE (PhD student); advisor PT Brun

- 2021-present: Daniel Alber, CBE (PhD student); advisor Stas Shvartsman
- 2021: Thesis examiner for Nicholas Martin, MOL (PhD student); advisor Zemer Gitai
- 2021: Thesis reader for Matthew Heinrich, MAE (PhD student); advisors Andrej Kosmrlj and Daniel Cohen
- 2021: Thesis reader for Nan Xue, MAE (PhD student); advisor Howard Stone
- 2021-present: Marcel Louis, MAE (PhD student); advisor Howard Stone
- 2021-present: Drew Carson, CBE (PhD student); advisor Jamie Link
- 2021-present: Madeleine Chalifoux, CBE (PhD student); advisors Stas Shvartsman and Eszter Posfai
- 2021-present: Lena Sabidussi, MAE (PhD student); advisor Marcus Hultmark
- 2021-present: Tejas Dethe, MAE (PhD student); advisors Andrej Kosmrlj and Howard Stone
- 2020-present: Omar Yehia, MAE (PhD student); advisor Howard Stone
- 2020-present: Paul Kaneeli, MAE (PhD student); advisor Howard Stone
- 2020-present: Christopher Ushay, CBE (PhD student); advisor PT Brun
- 2020-present: Avery Agles, CBE (PhD student); advisor Ian Bourg
- 2020-present: Ye Joon Seo, CBE (PhD student); advisor Rodney Priestley
- 2019: Matthew Black, Quantitative & Computational Biology (PhD student); advisor Josh Shaevitz
- 2019-present: Katelyn Randazzo, CBE (PhD student); advisor Rodney Priestley
- 2019-present: Jared Klein, CBE (PhD student); advisor Rick Register
- 2019-2022: Sayantan Dutta, CBE (PhD student); advisor Stas Shvartsman
- 2019-2021: Shuwen Yue, CBE (PhD student); advisor Athanassios Panagiotopoulos
- 2019: Ke-Chih Lin, Physics (PhD student); advisors James Sturm and Bob Austin
- 2018-present: Trevor Jones, CBE (PhD student); advisor PT Brun
- 2018-present: Bernardo Gouveia, CBE (PhD student); advisor Howard Stone
- 2018-present: Ari Gilman, CBE (PhD student); advisor Bruce Koel
- 2018-present: Nick Caggiano, CBE (PhD student); advisors Rodney Priestley and Robert Prud'homme
- 2018-2020: Chang Tian, CBE (PhD student); advisor Robert Prud'homme
- 2018-2019: Robert Pagels, CBE (PhD student); advisor Robert Prud'homme
- 2018-2019: Charles Watt, CBE (Undergraduate senior thesis student); advisor Craig Arnold
- 2018-2019: Stephen Wong, CBE (Undergraduate senior thesis student); advisor Craig Arnold
- 2018: Michail Alifierakis, CBE (PhD student); advisor Ilhan Aksay
- 2017-present: Kurt Ristroph, CBE (PhD student); advisor Robert Prud'homme
- 2017-present: Leon Wang, CBE (PhD student); advisor Robert Prud'homme
- 2017-2022: Lena Barrett, CBE (PhD student); advisor Stas Shvartsman
- 2017-present: Michael Palmer, CBE (PhD student); advisor Celeste Nelson
- 2017-present: Douglas Scott, CBE (PhD student); advisors Rodney Priestley and Robert Prud'homme
- 2017-2020: Eric Teitelbaum, Architecture (PhD student); advisor Forrest Meggers
- 2017-2018: Samuel Smiddy, CBE (Undergraduate senior thesis student); advisor Howard Stone

Other Outreach Activities

- Organizer, Princeton Soft Materials Coffee Hour, 2018-present
- Lecturer, Princeton Center for the Physics of Biological Function Summer School, 2020, 2022
- Lead organizer for "Physics in the ground beneath our feet" workshop at Princeton PCTS, 2022
- Co-organizer, Northeast Complex Fluids and Soft Matter (NCS) Workshop, January 2022
- Co-organizer, The Insider Outsider series on tenure track life in biophysics, 2022-present
- Organizer, Soft Matter Workshop between Princeton and University College Dublin, 2021
- Lead organizer, "Soft Matter For All: Celebrating Diversity and Creativity in Soft Matter" symposium, 2020, 2021
- Session moderator, "Materials for Today and Tomorrow" symposium at Princeton Institute of Materials, 2021
- Lead organizer for "Viscoelastic flow instabilities and elastic turbulence" workshop at Princeton PCTS, 2021
- Selection committee, Intersections Science Fellows Symposium, 2021
- Panelist, Princeton Pathways into Academy Program, 2020
- Lecturer and panelist, Princeton University Materials Academy, 2019, 2020
- Lecturer, PCCM Research Experience for Undergraduates, Summer 2019
- Participant, Princeton Día de la Ciencia Science Day, 2018, 2019, 2020
- Co-organizer for "Biologic and soft materials" session at Princeton PRISM Research Symposium, 2019
- Co-organizer for "Transport in Disordered Environments" workshop at Princeton PCTS, 2019

Awards/Honors to Advisees Based on Work in Our Lab

- August 2022: Victoria Muir, Presidential Postdoctoral Fellowship at Princeton
- June 2022: Carolina Trenado Yuste, New Jersey Commission on Cancer Research Postdoctoral Fellowship
- June 2022: R. Konane Bay, Best Poster Award, Conference on Engineered Living Materials (ELM) 2022, Saarbrücken, Germany
- June 2022: Meera Ramaswamy, Princeton Center for Complex Materials Postdoctoral Fellowship
- May 2022: Christopher Browne, Jui Dasgupta Outstanding Dissertation Award in CBE
- May 2022: Caroline Adkins, Sigma Xi Book awardee
- May 2022: Selena Chiu, SEAS Lore von Jaskowsky Memorial Prize awardee
- April 2022: Joanna Schneider, Maeder Graduate Fellowship in Energy and the Environment
- April 2022: Joanna Schneider, Graduate Teaching Award
- April 2022: Sebastian Gonzalez La Corte, Honorable Mention, NSF GRFP
- November 2021: Joanna Schneider, SEAS Award for Excellence
- November 2021: Christopher Browne, APS Padden Award finalist
- November 2021: Joanna Schneider, APS DFD travel award
- November 2021: Jenna Ott, 1st place, AIChE Graduate Student Competition, Microbes at Biomedical Interfaces Topical Conference
- November 2021: Jenna Ott, Winner, AIChE Division 15 Poster Competition

- November 2021: Navid Bizmark, ACS Environmental Chemistry Division Certificate of Merit award
- November 2021: Christopher Browne, AIChE Polymers (8A) graduate student award
- November 2021: Joanna Schneider, AIChE Women in Chemical Engineering travel award
- November 2021: Jenna Ott, AIChE Women in Chemical Engineering travel award
- October 2021: Callie Zheng, NEC Undergraduate Poster award, Andlinger Center Annual Meeting
- October 2021: Navid Bizmark, ACS Polymeric Materials Science & Engineering Future Faculty Fellow
- October 2021: Joanna Schneider, SoR graduate student travel award
- September 2021: Alejandro Martinez-Calvo, HFSP Postdoctoral Fellowship
- September 2021: Hongbo Zhao, PBI² Distinguished Postdoctoral Fellowship
- June 2021: Christopher Browne, 2nd place, Langmuir Graduate Student Oral Presentation Award, ACS Colloid and Surface Science Symposium
- June 2021: Selena Chiu, Reiner G. Stoll Undergraduate Summer Fellowship
- June 2021: Yaxin Duan, HMEI Environmental Scholars Program awardee
- May 2021: MaryKate Neff, SEAS George J. Muller awardee
- May 2021: Tapomoy Bhattacharjee, finalist, Charles H. Revson Senior Fellowship in Biomedical Sciences (declined due to starting faculty position)
- May 2021: Christopher Browne, ACEE Maeder Fellowship (declined due to holding Wallace Fellowship)
- April 2021: Jenna Ott, HMEI Mary & Randall Hack '69 Graduate Award winner
- March 2021: Christopher Browne, Princeton Wallace Memorial Honorific Fellowship
- March 2021: Jenna Ott, 2021 AAAS Student E-poster Competition, 2nd Place
- November 2020: Galen Mandes, Andlinger Center Annual Meeting Graduate Presentation Award
- November 2020: Christopher Browne, SEAS Award for Excellence
- September 2020: Audrey Shih, NSF GRFP Fellowship
- September 2020: Christopher Browne, CBE Kristine M. Layn Award winner
- September 2020: Tapomoy Bhattacharjee, Carnegie Mellon BME Forum Outstanding Poster Award
- September 2020: Anna Eddelbuettel Hancock, NSF GRFP awardee
- July 2020: R. Konane Bay, Presidential Postdoctoral Fellowship at Princeton
- June 2020: Cristian Arens, Reiner G. Stoll Undergraduate Summer Fellowship
- May 2020: Audrey Shih, MSE Outstanding Senior Thesis awardee
- May 2020: Audrey Shih, PRISM Best Senior Thesis awardee
- May 2020: Audrey Shih, SEAS Lore von Jaskowsky Memorial Prize awardee
- May 2020: Joanna Schneider, PEI Mary & Randall Hack '69 Graduate Award winner
- May 2020: Maggie O'Connell, SEAS George J. Muller awardee
- March 2020: Felix Kratz, APS Distinguished Student Award
- November 2019: Audrey Shih, Andlinger PSEG Best Poster awardee
- November 2019: Joanna Schneider, Andlinger Center ExxonMobil Best Poster Award winner
- November 2019: Nancy Lu, APS DFD Travel Award winner

- November 2019: Nancy Lu, 2019 SEAS Award for Excellence
- October 2019: Christopher Browne, CBE SABIC Best First Proposition Award winner
- September 2019: Jenna Ott, NSF GRFP awardee
- September 2019: Maggie O'Connell, DuPont Senior Thesis Fellowship Grant awardee
- September 2019: Audrey Shih, DuPont Senior Thesis Fellowship Grant awardee
- September 2019: Emily de Jong, NSF GRFP awardee
- May 2019: Christopher Browne, PEI Mary & Randall Hack '69 Graduate Award winner
- May 2019: Nancy Lu, PEI Mary & Randall Hack '69 Graduate Award winner
- May 2019: Emily de Jong, SEAS Hayes-Palmer prize awardee
- March 2019: Nancy Lu, APS GSOF Travel Award winner
- January 2019: Jeremy Cho, Princeton Center for Theoretical Sciences Poster Award winner
- November 2018: Tapomoy Bhattacharjee, Andlinger Center E-affiliates Poster Award
- November 2018: Nancy Lu, Andlinger ExxonMobil Best Poster Award winner
- September 2018: Christopher Browne, NSF GRFP awardee
- June 2018: Tapomoy Bhattacharjee, Andlinger Center Distinguished Postdoctoral Fellowship
- May 2018: Navid Bizmark, Princeton Center for Complex Materials Postdoctoral Fellowship
- May 2018: Nathanael Ji, Princeton Research Day Poster awardee
- April 2018: Maziar Derakhshandeh, Canadian NSERC Postdoctoral Fellowship
- March 2018: Daniel Amchin, SEAS travel funding recipient
- March 2018: Daniel Amchin, APS DBIO Travel Award winner
- March 2018: Christopher Browne, SEAS travel funding recipient
- March 2018: Nancy Lu, SEAS Travel Award winner