

# Sujit S. Datta: Curriculum Vitae

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## Professional Positions

September 2024 – present: *California Institute of Technology*  
Professor of Chemical Engineering, Bioengineering, and Biophysics

August 2017 – August 2024: *Princeton University*  
Associate Professor of Chemical & Biological Engineering (July 2023 – August 2024)  
Assistant Professor of Chemical & Biological Engineering (August 2017 – July 2023)  
Founding Faculty Member, Omenn-Darling Bioengineering Institute  
Senior Investigator, Center for the Physics of Biological Function  
Associated Faculty: Princeton Materials Institute, Princeton Biophysics Graduate Program,  
Andlinger Center for Energy and the Environment, High Meadows Environmental Institute

## Education and Training

October 2013 – June 2017: *California Institute of Technology*  
Postdoctoral Fellow, Chemical Engineering; Mentor: Rustem F. Ismagilov

September 2008 – September 2013: *Harvard University*  
Ph.D. Physics, A. M. Physics; Advisor: David A. Weitz

September 2004 – May 2008: *University of Pennsylvania*  
M. S. Physics, B. A. Mathematics and Physics (honors), summa cum laude; Advisor: A. T. Charlie Johnson, Jr.

## Selected Honors and Awards

- Soft Matter Lectureship of the Royal Society of Chemistry, 2024
- American Institute of Chemical Engineers (AIChE) Allan P. Colburn Award, 2023
- Society of Rheology (SoR) Arthur B. Metzner Early Career Award, 2023
- Princeton Engineering Council, Excellence in Teaching Award, 2023
- Princeton Engineering Commendation for Outstanding Teaching, 2018, 2019, 2020, 2022, 2023, 2024
- American Physical Society (APS) Early Career Award for Biological Physics Research, 2023
- 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
- Stanley Corrsin Memorial Lecturer, Johns Hopkins University, 2021
- AIChE 35 Under 35 Award, 2020
- American Chemical Society (ACS) Unilever Award in Colloid & Surfactant Science, 2020
- NSF CAREER Award, 2019
- Alfred Rheinstejn Award (Princeton University) recognizing excellence in teaching and scholarship, 2018
- APS Andreas Acrivos Dissertation Award in Fluid Dynamics, 2015
- APS LeRoy Apker Award, 2008

## Research Overview

My group's research focuses on the transport & dynamics of complex, soft ("squishy"), and living systems. Our work focuses on complex fluids, gels, and bacterial communities/active matter to address challenges in biotechnology, energy, medicine, and sustainability. Our work integrates microscopy, microfluidics, materials science, and biophysical characterization with theoretical & computational modeling, applying ideas from fluid and solid mechanics, colloidal science, polymer physics, statistical mechanics, and network science.

## Research, Mentoring, and Teaching – Summary

- Publications: >5,500 Google Scholar citations; *h* index = 39; >90 papers published/in press in e.g., *PNAS*, *Physical Review Letters*, *Nature Communications*, *Science Advances*, *eLife*. Notable contributions include:
  - Biophysics – Developed insights into how bacterial behavior is altered in complex spaces (*PRL* 2023, *PNAS* 2022, *PRL* 2022, *eLife* 2022, *Nature Comms.* 2021, *Biophysical J.* 2021, *Nature Comms.* 2019), and ways in which polymers regulate gut structure and function (*PNAS* 2016, *eLife* 2019).
  - Fluid dynamics – Developed insights into how polymer solutions (*PNAS* 2024, *JFM* 2023, *Science Adv.* 2021, *JFM* 2020), colloidal dispersions (*Phys. Rev. Res.* 2023, *Science Adv.* 2020), and immiscible fluids (*Phys. Rev. Fluids* 2021 & 2019, *Phys. Fluids* 2014, *PRL* 2013) are transported in porous media.
  - Soft mechanics – Developed insights into how hydrogels swell (*Science Adv.* 2021), crack (*Soft Matter* 2024), and self-heal (*PRL* 2019) in confinement, as well as how porous microcapsules buckle (*PRL* 2012).
- Invited talks: >100 invited seminars at e.g., Caltech, MIT, Stanford, APS, ACS, AIChE meetings, & overseas.
- Intellectual property: 1 patent granted (India), 3 applications filed, 5 more provisional applications filed.
- Postdoctoral researchers: 15 advised; 6 moved to faculty positions, 1 moved to industry.
- PhD students: 11 advised; 5 graduated – 2 moved to consulting, 3 moved to postdocs.
- MSE students: 1 advised; he graduated and moved on to be an instructor at West Point Military Academy.
- Undergraduate students: 31 advised; ≥10 moved on to graduate school, ≥3 moved to non-academic jobs.
- Visiting student researchers: 5 advised, 3 from Germany, 1 from UK, 1 from India.
- Teaching: Undergraduate and graduate courses relating to thermodynamics, transport, soft matter, and lab work, with ratings as high as 4.95/5 and evaluations that “this is the best course I have taken at Princeton”.

## Professional Activities, Service, and Outreach – Summary

- Reviewer: 10–30 manuscripts per year for >39 journals.
- Organizer or chair: >18 sessions at meetings of e.g., APS, ACS, AIChE, Society of Rheology, InterPore; workshops & symposia including *Soft Matter For All* (2020, 2021, 2022); *Transport in Disordered Environments* (2019); *Viscoelastic flow instabilities & elastic turbulence* (2021); *Physics in the Ground Beneath our Feet* (2022); *Northeast Complex Fluids & Soft Matter Workshop* (2022); *Space the final frontier of microbial communities* (2023); *Active Matter in Complex Environments* Aspen Physics Conference (2023); *Bacteria versus Phage: the Main Event* (2024); *Banff Workshop on Non-Newtonian Flows in Porous Media* (2024); *Insider Outsider* biophysics series, 2022–2023; Princeton *Soft Matter Coffee Hour* from 2018–2024.
- Grant proposal reviewer: >10 funding agencies (US, Germany, Netherlands, France, Canada).
- Societal committees: APS (DSOFT Member at Large), AIChE (Area 1J program, 2025 Meeting Program Chair)
- External thesis committee member: PhD students at OIST, Georgia Tech, NJIT, CCNY, Germany.
- Outreach activities: Marine Biological Laboratory 2024 Physiology Course Faculty Instructor; Princeton *Día de la Ciencia Science Day*, Princeton University Materials Academy (PUMA) for economically disadvantaged students repeatedly from 2017–present.
- Journal editor: Editorial Boards of *Annual Reviews of Condensed Matter Physics* and *J. Non-Newtonian Fluid Mechanics*; *Frontiers in Physics* special issue on active matter; *Frontiers in Soft Matter*, review editor.
- Service at Princeton: Various committees in Chemical & Biological Engineering, School of Engineering and Applied Science, and at the University level, plus being on the thesis committee for >41 students.

## Publications (>5,500 Google Scholar Citations; h index = 39)

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

### Submitted/under review – 7 total:

101. Stagnation points at grain contacts generate an elastic flow instability in 3D porous media  
E. Y. Chen, C. A. Browne, S. J. Haward, A. Q. Shen, and S. S. Datta\*, pre-print available at *arxiv* 2412.03510  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
100. Morphodynamics of surface-attached active drops  
A. Martínez-Calvo\* and S. S. Datta\*, pre-print available at *arxiv* 2411.14636  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
99. On the growth and form of bacterial colonies  
R. Portert†, C. Trenado-Yuste†, A. Martínez-Calvo†, M. Su, N. S. Wingreen\*, S. S. Datta\*, K. C. Huang\*  
Relevant research areas: [Active and living matter](#)
98. Navigating the maze of groundwater cleanup  
C. A. Browne\* and S. S. Datta\*  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
97. Influence of fluid rheology on multistability  
in the unstable flow of polymer solutions through pore constriction arrays  
E. Y. Chen and S. S. Datta\*, pre-print available at *arxiv* 2407.00778  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
96. Pattern formation by bacteria-phage interactions  
A. Martínez-Calvo\*, N. S. Wingreen\*, S. S. Datta\*,  
pre-print available at *bioRxiv* 2023.09.19.558479  
Relevant research areas: [Active and living matter](#)
95. 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](#)

### Published or in press – 67 total:

94. Morphogenesis of bacterial colonies in polymeric environments  
S. Gonzalez La Corte, C. A. Stevens, G. Cárcamo-Oyarce, K. Ribbeck, N. S. Wingreen\*, S. S. Datta\*,  
*Science Advances* (in press); pre-print available at *bioRxiv* 2024.04.18.590088  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
93. Interfacial morphodynamics of proliferating microbial communities  
A. Martínez-Calvo†, C. Trenado-Yuste†, H. Lee, J. Gore, N. S. Wingreen\*, S. S. Datta\*,  
*Physical Review X* (in press); pre-print available at *bioRxiv* 2023.10.23.563665  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
92. Microbes get by with a little help from their friends  
S. S. Datta\*, *Nature Chemical Engineering* (in press); pre-print available at *arxiv* 2410.20648  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)

91. Life at low Reynolds number isn't such a drag  
S. S. Datta\*, *Nature Chemical Engineering* (in press); pre-print available at *arxiv* 2410.20648  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
90. Harnessing an elastic flow instability to improve the kinetic performance of chromatographic columns  
F. Gritti\*, E. Y. Chen†, and S. S. Datta\*, *J. Chromatography A* 1735, 465326 (2024)  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
89. Harnessing elastic instabilities for enhanced mixing and reaction kinetics in porous media  
C. A. Browne and S. S. Datta\*, *PNAS* 121, e2320962121 (2024)  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
88. Influence of bacterial swimming and hydrodynamics on infection by phages  
C. Lohrmann\*, C. Holm\*, and S. S. Datta\*, *Soft Matter* 20, 4785 (2024)  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)
87. Interplay between environmental yielding and dynamic forcing regulates bacterial growth  
A. M. Hancock and S. S. Datta\*, *Biophysical J.* 123, 957 (2024)  
Relevant research areas: [Active and living matter](#), [Complex fluids](#)  
Highlighted as a 'new and notable' article in *Biophysical J.*
86. Obstructed swelling and fracture of hydrogels  
A. Plummert, C. Adkins†, J-F Louf, A. Košmrlj\*, S. S. Datta\*, *Soft Matter* 20, 1425 (2024)  
Relevant research areas: [Soft mechanics](#)
85. 3D printing bacteria to study motility and growth in complex 3D porous media  
R. K. Bay\*, A. M. Hancock, A. S. Dill-Macky†, H. N. Luu†, S. S. Datta\*, *JoVE* 203, e66166 (2024)  
Relevant research areas: [Active and living matter](#)
84. Data-driven discovery of chemotactic migration of bacteria via coordinate-invariant machine learning  
Y. M. Psarellis, S. Lee, T. Bhattacharjee, S. S. Datta, J. M. Bello-Rivas, I. G. Kevrekidis,  
*BMC Bioinformatics* (in press); pre-print available at *arxiv* 2208.11853  
Relevant research areas: [Active and living matter](#)
83. Soft matter physics of the ground beneath our feet  
A. Voigtländer, M. Houssais, K. A. Bacik, I. C. Bourg, J. C. Burton, K. E. Daniels, S. S. Datta,  
E. Del Gado, N. S. Deshpande, O. Devauchelle, B. Ferdowsi, R. Glade, L. Goehring, I. J. Hewitt,  
D. Jerolmack, R. Juanes, A. Kudrolli, C-Y Lai, E. Lio, C. Masteller, K. Nissanka, A. M. Rubin,  
H. A. Stone, J. Suckale, N. M. Vriend, J. S. Wettlaufer, J. Q. Yang, *Soft Matter* 20, 5859 (2024)  
Relevant research areas: [Complex fluids](#), [Flow in porous media](#), [Nanoscience](#), [Transport in networks](#)
82. Ribogreen fluorescent assay kinetics to measure ribonucleic acid loading into lipid nanoparticle carriers  
N. Bizmark, S. Nayagam, D. Amelemah, D. Zhang,  
S. S. Datta, R. D. Priestley, T. Colace, J. Wang, R. K. Prud'homme, *Adv. Materials Int.* 11, 2301083 (2024)  
Relevant research areas: [Complex fluids](#), [Nanoscience](#)
81. Chemotactic motility-induced phase separation  
H. Zhao, A. Košmrlj, S. S. Datta\*, *Physical Review Letters* 131, 118301 (2023)  
Relevant research areas: [Active and living matter](#)  
Selected as a *PRL* Editors' Suggestion

80. Fluid drainage in erodible porous media  
 J. Schneider, C. A. Browne, M. Slutzky+, C. A. Quirk+, D. B. Amchin, S. S. Datta\*,  
*Physical Review Research* 5, 043015 (2023)  
 Relevant research areas: [Complex fluids](#), [Flow in porous media](#), Nanoscience, [Transport in networks](#)
79. Homogenizing fluid transport in stratified porous media using an elastic flow instability  
 C. A. Browne, R. B. Huang+, C. W. Zheng+, S. S. Datta\*, *J. Fluid Mechanics* 963, A30 (2023)  
 Relevant research areas: [Complex fluids](#), [Flow in porous media](#)
78. Liquid-liquid phase separation within fibrillar networks  
 J. X. Liu, M. P. Haataja, A. Košmrlj, S. S. Datta, C. B. Arnold, R. D. Priestley,  
*Nature Communications*, 14, 6085 (2023)  
 Relevant research areas: [Active and living matter](#), [Complex fluids](#), [Flow in porous media](#)
77. Tough and recyclable phase-separated supramolecular gels via a dehydration-hydration cycle  
 X. Xu, Y. I. Eatmon, K. S. S. Christie, A. L. McGaughey, N. Guillomaitre,  
 S. S. Datta, Z. J. Ren, C. Arnold, R. D. Priestley, *JACS Au*, 3, 2772 (2023)  
 Relevant research areas: [Complex fluids](#), Nanoscience
76. An energy-optimization method to study gel-swelling in confinement  
 C. Joshi, M. Q. Giso, J-F Louf, S. S. Datta, T. J. Atherton, *Soft Matter*, 19, 7184 (2023)  
 Relevant research areas: [Soft mechanics](#)
75. 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 (2023)  
 Relevant research areas: [Active and living matter](#)
74. Flow-driven channelization in a particle-filled porous medium  
 N. Bizmark and S. S. Datta\*, *Album of Porous Media Structure and Dynamics*, Springer publishing (2023)  
 Relevant research areas: [Complex fluids](#), [Flow in porous media](#), Nanoscience, [Transport in networks](#)
73. Proliferating active matter  
 O. Hallatschek, S. S. Datta, K. Drescher, J. Dunkel, J. Elgeti, B. Waclaw, N. S. Wingreen,  
*Nature Reviews Physics* 5, 407 (2023)  
 Relevant research areas: [Active and living matter](#)
72. Modeling the transition between localized and extended deposition in  
 flow networks through packings of glass beads  
 G. Kelly, N. Bizmark, B. Chakraborty, S. S. Datta, T. G. Fai, *Physical Review Letters* 130, 128204 (2023)  
 Relevant research areas: [Complex fluids](#), Nanoscience, [Flow in porous media](#), [Transport in networks](#)
71. 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, S. L. Biswal, D. Sinton\*, *Lab on a Chip* 23, 1358 (2023)  
 Relevant research areas: [Complex fluids](#), [Flow in porous media](#), Nanoscience
70. Mucin glycans maintain coexistence in oral microbial communities  
 C. M. Wu, K. M. Wheeler, G. Cárcamo-Oyarce, K. Aoki, A. McShane,  
 S. S. Datta, J. L. Mark Welch, M. Tiemeyer, A. L. Griffen, K. Ribbeck,  
*npj Biofilms & Microbiomes* 9, 11 (2023)  
 Relevant research areas: [Active and living matter](#)

69. 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, *ACS Central Science* 9, 177(2023)  
Relevant research areas: [Complex fluids](#), Nanoscience
68. Morphological instability and roughening 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\*, *PNAS*, 119, e2208019119(2022)  
Relevant research areas: [Active and living matter](#)
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. Amchin†, 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. 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](#)
62. 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, *ACS Nano*, 16, 16133(2022)  
Relevant research areas: [Complex fluids](#), Nanoscience
61. Chemorepellent-loaded nanocarriers promote localized interference of *E. coli* transport to inhibit biofilm formation  
T. Kuper, L. Wang, R. K. Prud'homme, S. S. Datta, R. M. Ford, *ACS Applied Bio Materials* 5, 5310(2022)  
Relevant research areas: [Active and living matter](#), Nanoscience
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. Mandalf†, 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<sup>+</sup>, B K. Wilson, A. Kujović<sup>+</sup>, 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<sup>†</sup>, D. B. Amchin<sup>†</sup>, J. Schneider<sup>†</sup>, S. S. Datta<sup>\*</sup>, *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<sup>\*</sup>, *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<sup>+</sup>, S. S. Datta<sup>\*</sup>, *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. Lut, A. A. Pahlavan<sup>†</sup>, C. A. Browne, D. B. Amchin, H. A. Stone, S. S. Datta<sup>\*</sup>,  
*Physical Review Applied*, 14, 054009 (2020)  
 Relevant research areas: [Flow in porous media](#)
40. Elastocapillary network model of inhalation  
 J-F Louft, F. Kratz<sup>†</sup>, S. S. Datta<sup>\*</sup>, *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<sup>\*</sup>, *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<sup>\*</sup>, *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<sup>+</sup>, S. S. Datta<sup>\*</sup>, *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<sup>+</sup>, S. S. Datta<sup>\*</sup>, 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](#)
27. High-molecular-weight polymers from dietary fiber drive aggregation of particulates in the murine small intestine  
 A. P. 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)  
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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<sup>+</sup>, 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. Datta†, 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. Datta†, 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. Datta†, S-H Kim†, J. Paulose†, 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<sup>+</sup>, T. S. Rhodes<sup>+</sup>, 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  
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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

8. Accelerated mixing and reaction kinetics using an elastic instability,  
S. S. Datta, C. A. Browne, R. Huang, and C. Zheng,  
US Patent Application Filed on 7/12/23 (US Application number 18/221,086)
7. Method to 3D-Print Engineered Living Materials,  
S. S. Datta, R. D. Priestley, X. Xu, R. K. Bay, US Patent Application Filed on 5/3/24  
(PCT Application number PCT/US2022/048912)

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) Indian Patent #463649 granted on 10/30/23
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
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

148. February 2025: Flowing matter in porous media CECAM workshop, Berlin Germany
147. January 2025: Center for Theoretical Biological Physics, Rice University, Houston TX
146. January 2025: Gordon Research Conference on Stochastic Physics in Biology, Ventura CA
145. November 2024: Population Dynamics Seminar Series (virtual) hosted by University of Edinburgh, UK & Friedrich Schiller University Jena, Germany
144. November 2024: "Growing microbial colonies as active solids", KITP Program on Active Solids: From Metamaterials to Biological Tissue, Santa Barbara CA
143. October 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Plenary Session on Flows in Sustainability and the Environment, AIChE annual meeting, San Diego CA
142. October 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Frontiers in Soft Matter and Macromolecular Networks Symposium, San Diego CA
141. October 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Samsung Global Research Symposium on Soft Matter & Biophysics, Nantucket Island MA
140. October 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Distinguished Lecture, Northeastern University, Chemical Engineering, Boston MA
139. September 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Center for Nonlinear Dynamics, UT Austin, Austin TX
138. September 2024: "The wisdom of the crowd: How bacterial collectives (re)shape themselves", Physics and Medicine Symposium, Max-Planck-Zentrum für Physik und Medizin, Erlangen, Germany

137. July 2024: "Life in a tight spot: Spying on bacteria in complex spaces", Squishy Physics Seminar, Harvard University, Cambridge MA
136. July 2024: "All stirred up: Using polymers for chaotic mixing & enhanced reaction kinetics", Gordon Research Conference on Polymer Physics, South Hadley MA
135. July 2024: "Watching microbial life in complex environments", Woods Hole Marine Biological Laboratory, Physiology Course, Woods Hole, MA
134. June 2024: "Getting in shape: how growing microbial colonies are like "active" fluids", Systems Biology Theory Lunch, Harvard Medical School, Boston MA
133. June 2024: "Watching microbial life in complex environments", Center for Soft and Living Matter, University of Pennsylvania, Philadelphia PA
132. May 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Biology Seminar, Emory University, Atlanta GA
131. May 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Physics of Living Systems Seminar, Georgia Tech, Atlanta GA
130. April 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Chemical and Biomolecular Engineering Seminar, UC Irvine
129. April 2024: "Using biofabrication to discover how bacterial collectives (re)shape themselves", Distinguished Lecture Series on Engineering with Living Materials, ETH Zurich, Switzerland (virtual)
128. April 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Workshop on Transport Properties in Soft Matter systems, Erwin Schrödinger International Institute for Mathematics and Physics, Vienna Austria (virtual)
127. April 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", University of Florida, Chemical Engineering, Gainesville FL
126. March 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Physics Colloquium, UC Merced, Merced, CA
125. March 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Bioengineering Seminar, UC Berkeley, Berkeley, CA
124. March 2024: "Getting in shape: How growing microbial colonies are like "active" fluids", American Physical Society (APS) March Meeting, Minneapolis MN
123. February 2024: "Chaos in confinement: How to make shear-thinning fluids flow thicken", Center for Enhanced Nanofluidic Transport, MIT, Cambridge MA (virtual)
122. February 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Center for Computational & Integrative Biology Seminar, Rutgers University, Camden NJ
121. February 2024: "Harnessing the wisdom of the crowd: Watching bacteria coordinate their behavior in groups", Center for Mathematical Biology, University of Pennsylvania, Philadelphia PA
120. January 2024: "Sticking together: How bacterial collectives (re)shape themselves", Frontiers in BioDesign Seminar, Duke Center for Quantitative BioDesign, Durham NC
119. November 2023: "Chaos in confinement: How to make shear-thinning fluids flow thicken", DAMTP & JFM Fluid Mechanics Webinar series

118. October 2023: "Growing microbial colonies are unstable 'active' fluids",  
Society for Engineering Science Meeting, Twin Cities MN
117. October 2023: "Chaos in confinement: How to make shear-thinning fluids flow thicken",  
Taylor Medal Symposium, Society for Engineering Science Meeting, Twin Cities MN
116. October 2023: "Sticking together: How bacterial collectives (re)shape themselves",  
Royal Society Workshop on Complex Rheology in Biological Systems, Leeds UK
115. September 2023: "Sticking together: How bacterial collectives (re)shape themselves",  
Physics of Living Matter Symposium, Cambridge University, Cambridge UK
114. September 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
Fluid mechanics seminar, Stanford University, Stanford CA
113. September 2023: "Sticking together: How bacterial collectives (re)shape themselves",  
Isaac Newton Institute for Mathematical Sciences,  
Workshop on "Measures and Representations of Interactions", Cambridge UK
112. August 2023: "Chaos in confinement: How to make shear-thinning fluids flow thicken",  
Gordon Research Conference on Soft Condensed Matter Physics, New London NH
111. July 2023: "Chaos in confinement: How to make shear-thinning fluids flow thicken",  
Arthur B. Metzner Early Career Award Lecture,  
International Congress on Rheology, Athens Greece
110. June 2023: "Sticking together: How bacterial collectives (re)shape themselves",  
Workshop on self-assembly and organization in non-equilibrium systems,  
Telluride Science & Innovation Center, Telluride CO
109. June 2023: "Sticking together: How bacterial collectives (re)shape themselves",  
48th International Conference on the Biology of Myxobacteria, Chauncey Center, Princeton NJ
108. June 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
Laboratoire Navier, Champs sur Marne France
107. June 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
Fluides, Automatique et Systèmes Thermiques (FAST) seminar,  
Université Paris-Saclay, Orsay France
106. June 2023: "Chaos in confinement: How to make shear-thinning fluids flow thicken",  
Fluides, Automatique et Systèmes Thermiques (FAST) seminar,  
Université Paris-Saclay, Orsay France
105. May 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
University of Edinburgh, Higgs Centre for Theoretical Physics, Edinburgh Scotland
104. May 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
University College London, Mathematics, London UK
103. May 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
Imperial College, Chemical Engineering Distinguished Seminar, London UK
102. April 2023: "Life in a tight spot: How bacteria navigate crowded spaces",  
University of Delaware, Chemical and Biomolecular Engineering, Newark DE

101. April 2023: "Life in a tight spot: How bacteria navigate crowded spaces", MIT, Chemical Engineering, Cambridge MA
100. April 2023: "Life in a tight spot: How bacteria navigate crowded spaces", U Mass Amherst, Physics and Astronomy, Amherst MA
99. March 2023: "Life in a tight spot: How bacteria navigate crowded spaces", Arizona State University, Biological Physics, Tempe AZ
98. February 2023: "Life in a tight spot: How bacteria navigate crowded spaces", MIT, Biological Engineering, Cambridge MA
97. February 2023: "Life in a tight spot: How bacteria navigate crowded spaces", Northwestern University, Science for Protection of Engineered Environments, Evanston IL
96. January 2023: "Sticking together: How bacterial collectives (re)shape themselves", Gordon Research Conference on Complex Active and Adaptive Material Systems, Ventura CA
95. January 2023: "Life in a tight spot: How bacteria navigate crowded spaces", UCSF, Biophysics/Bioinformatics/Chemistry and Chemical Biology, San Francisco CA
93. January 2023: "Sticking together: How bacterial collectives (re)shape themselves", Keynote speaker, Cornell University Chemical and Biomolecular Engineering Graduate Research Symposium, Ithaca NY
93. January 2023: "Life in a tight spot: How bacteria navigate crowded spaces", Purdue University, Biophysics, West Lafayette, IN (virtual)
92. December 2022: "Life in a tight spot: How bacteria navigate crowded spaces", Stanford University, Chemical Engineering, Stanford CA
91. November 2022: "Life in a tight spot: How bacteria navigate crowded spaces", University of Southern California, Physics and Astronomy, Los Angeles CA (virtual)
90. November 2022: "Life in a tight spot: How bacteria navigate crowded spaces", 3rd International Workshop on Stochasticity and Fluctuations in Small Systems, Pohang Korea
89. November 2022: "Viscoelastic flow instabilities in porous media", Gordon Research Conference on Colloidal, Macromolecular, and Polyelectrolyte Solutions, Ventura CA
88. October 2022: "Life in a tight spot: How bacteria navigate crowded spaces", University of Minnesota, Chemical Engineering and Materials Science, Minneapolis MN
87. September 2022: "Life in a tight spot: How bacteria spread in porous media", Bucknell University, Physics and Astronomy, Lewisburg PA
86. August 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**

### **Current postdoctoral researchers**

- June 2023-present: Ahmed Al Harraq (PhD, Louisiana State University; co-advised with Joshua Shaevitz)
- June 2022-present: Meera Ramaswamy (PhD, Cornell)
- February 2022-present: Babak Vajdi Hokmabad (PhD, Max Planck Institute, 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)

### **Former postdoctoral researchers**

- August 2022–November 2024: Nikhil Subraveti (PhD, University of Maryland; co-advised with Bob Prud'homme), went on to next position as an ORISE fellow at the FDA
- September 2021–July 2024: Hongbo Zhao (PhD, MIT; co-advised with Andrej Košmrlj and Cliff Brangwynne), went on to next position as an Assistant Professor at UCSD
- September 2022–July 2024: Victoria Muir (PhD, University of Pennsylvania), went on to next position as an Assistant Professor at the University of Delaware
- March–August 2023: Christopher Browne (PhD, Princeton), went on to next position as a Postdoctoral Researcher with Chinedum Osuji at Penn
- July 2020–June 2022: R. Konane Bay (PhD, U. Massachusetts Amherst), went on to next position as an Assistant Professor at CU Boulder
- May 2018–April 2022: Navid Bizmark (PhD, U. Waterloo; co-advised with Rod Priestley & Bob Prud'homme), went on to next position as an Associate Research Scholar with Rod Priestley & Bob Prud'homme
- 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 2024-present: Robert Craig Singiser (PhD candidate, CBE)
- January 2024-present: Danielle Sclafani (PhD candidate, CBE)
- 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)

### **Former graduate students**

- January 2023-August 2024: Sanjana Kamath (PhD candidate, CBE); went on to be advised by Prof. Emily Davidson at Princeton for her PhD after I moved to Caltech
- January 2019-August 2023: Jenna Ott (PhD in CBE); went on to next position as a Postdoctoral Researcher at U. Delaware, advised by Mark Blenner and Kevin Solomon
- January 2019-May 2023: Joanna Schneider (PhD in CBE co-advised by Rodney Priestley); went on to next position as an Associate in Thermal Sciences at Exponent Consulting
- 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

### **Former undergraduate student researchers**

- September 2023-May 2024: Aya Eyceoz (CBE, Independent research)
- September 2023-May 2024: Ipsita Tinga (CBE, Senior thesis)
- June 2023-May 2024: Fatmata Nallo (CBE, Independent research, Senior thesis)
- February 2023-May 2024: India Ingemi (MOL, Independent research, Senior thesis)
- September 2022-January 2024: Amina Anowara (CBE, Independent research)
- June-August 2021, September 2023-May 2024: Callie Zheng (CBE, Andlinger internship, Senior thesis)
- January 2022 -May 2023: Arabella Dill-Macky (CBE, Independent research, Senior thesis)
- June 2021-May 2023: Yaxin Duan (CBE, HMEI Environmental Scholars Program, Independent research), went on to next position as a consultant in Boston
- September 2021-May 2023: Hao Nghi Luu (CBE, Independent research, Senior thesis), went on to next position as a PhD student in Materials Science and Engineering at MIT
- June-September 2022: Ariana Di Landro (CBE, OURSIP program, Independent research)
- 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 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 work), went on to next position as a PhD student in Chemical Engineering at MIT
- 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)
- February-May 2021: Malcolm Slutzky (Physics, Independent research), went on to next position as a PhD student in Physics at the University of Chicago
- 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), went on to next position as a PhD student in Chemical Biology at Imperial College London
- September 2018-May 2020: Audrey Shih (CBE, Independent research, Senior thesis, Andlinger 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), went on to next position as a PhD student in Biomedical Engineering at Yale University
- 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 researchers**

- February-November 2023: Anushree Malik (Visiting Fulbright-Kalam Fellow, Professor at IIT Delhi)
- June-September 2023: Joseph Borovoy (Visiting Undergraduate from UCSD)
- June-July 2023: Martin Lellep (PhD student, University of Edinburgh)
- February-May 2023: Christoph Lohrmann (PhD student, University of Stuttgart)
- 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

- Fall 2023: CBE 430 – *Squishy Engineering: Using Soft Materials to Solve Hard Problems*; 58 students  
Instructor-specific lecture quality rating: 4.5/5; Overall course rating: 4.51/5;  
Evaluated as “amazing”, “the best”, and “I thoroughly enjoyed this course and found myself way more interested in soft matter than I thought I ever would.”
- Fall 2022: CBE 430 – *Squishy Engineering: Using Soft Materials to Solve Hard Problems*; 59 students  
Instructor-specific lecture quality rating: 4.67/5; Overall course rating: 4.67/5;  
Evaluated as “mind-blowingly excellent”, “the most caring and engaging professor I have met at the entire university”, and “by far the best class I have ever taken at my time at Princeton.”
- 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, Communications Physics, PLoS Computational Biology, Physical Review X*

### **Organizer/chair of sessions at scientific meetings**

- "Biological active matter" and "Bacteria and Phage: From Individuals to Ecosystem" sessions, APS March Meeting, 2024
- "Rheology of living and active systems" session, International Congress on Rheology, 2023
- "New developments in elastic turbulence and flow instabilities" session, APS March Meeting, 2023
- "Bacterial communities" session, APS March Meeting, 2023
- "Complex fluids" session, AIChE Annual Meeting, 2022
- "Systems biology for engineering microbes" session, AIChE Annual Meeting, 2022
- "Rheology of soil, mud and construction materials" session, Society of Rheology, 2022
- "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 and Active Systems" session, AIChE Annual Meeting, 2021
- "Complex Fluids" session, AIChE Annual Meeting, 2021
- "Technologies for Understanding Microbial Interactions" session, AIChE Annual 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
- "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
- "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**

- APS DBIO Early Career Award Selection Committee, 2024
- SoR Metzner Award Selection Committee, 2024-2026
- APS DSOFTE Gallery of Soft Matter Committee Chair, 2024-2025
- APS DSOFTE Member at Large, 2023-2026
- AIChE Area 1J Fluid Mechanics 2025 Meeting Program Coordinator (MPC)
- AIChE Area 1J Fluid Mechanics Programming Committee, 2021-2026
- APS Apker Prize Selection Committee, 2018-2021

### **Grant proposal reviewer**

- Alfred P. Sloan Foundation, Matter-to-Life Program, 2024
- Leverhulme Trust, Research Project Grant Program, 2023
- NSF Physics of Living Systems Program, 2023
- NSF Division of Materials Research, 2023
- 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**

- 2024: Christoph Lohrmann, Physics (PhD student at University of Stuttgart); advisor Christan Holm
- 2024: Giovanni Savorana, Civil, Environmental, and Geomatic Engineering (PhD student at ETH Zurich); advisors Eleonora Secchi and Roman Stocker
- 2023: Haibei Zhang, Biophysical Sciences (PhD student at U. Chicago); advisor Jasmine Nirody
- 2023: Steffen Geisel, Materials Science (PhD student at ETH Zurich); advisors Eleonora Secchi and Jan Vermant
- 2023: Haibei Zhang, Biophysical Sciences (PhD student at U. Chicago); advisor Jasmine Nirody
- 2021-2023: Yasser Almoteri, Mathematical Sciences (PhD student at NJIT); advisor Enkeleida Lushi
- 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: Shuaijun Li, Mechanical Engineering (PhD at CCNY); advisor Jing Fan

### **Other Professional Activities and Service**

- Editorial Board Member, *Annual Reviews of Condensed Matter Physics*, 2023-present
- Research Faculty Instructor, *Marine Biological Laboratory Physiology Course*, 2024
- Editorial Board Member, *Journal of Non-Newtonian Fluid Mechanics*, 2023-present
- Co-organizer, *Workshop on Non-Newtonian Flows in Porous Media*, Banff International Research Station, Alberta, Canada, 2024
- 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 Caltech**

- Center for Environmental Microbial Interactions steering committee, 2024-2025
- Chemical Engineering graduate admissions, 2024-2025
- Biological Engineering graduate admissions, 2024-2025

### **Thesis Committees**

- Boyuan Chen, Chemical Engineering (PhD student); advisor John Brady
- Akash Dhawan, Medical Engineering (MD/PhD student); advisor Julia Kornfield
- Catherine Griffin, Bioengineering (PhD student); advisor Gözde Demirer
- Wesley Patel, Chemical Engineering (PhD student); advisor Katherine Faber

### **Service at Princeton**

#### **Chemical and Biological Engineering Department**

- Director of Graduate Studies, July 2022-January 2024
- Member, Target of Opportunity / senior faculty search committee, September 2020-May 2023
- 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, Executive Committee, Omenn-Darling Bioengineering Institute, September 2023-May 2024
- 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-August 2024
- Member, Graduate School Policy Committee, July 2023-January 2024
- 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, Executive Committee for the Princeton Center for Complex Materials, July 2022-June 2026
- Member, Faculty Committee on the Graduate School, July 2022-onward
- Member, 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**

- Brian Wilson, CBE (PhD student); advisor Bob Prud'homme
- Niki Abbasi, MAE (PhD student); advisor Howard Stone
- Jonghyun Hwang, MAE (PhD student); advisor Howard Stone
- Emily Wei-Hsin Sun, CEE (PhD student); advisor Ian Bourg
- Binglun Shao, CBE (Undergraduate senior thesis student); advisor Stas Shvartsman
- Satyen Dhamankar, CBE (PhD student); advisor Michael Webb
- Emily Fergerson, CBE (PhD student); advisor Emily Davidson
- Lingzhi Cai, CBE (PhD student); advisor PT Brun

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

## **Other Outreach Activities**

- Organizer, Princeton Soft Materials Coffee Hour, 2018-2024
- SciDay lecturer, Princeton Molecular Biology Outreach Program, January 2024
- Co-organizer, "Bacteria versus Phage: the Main Event" workshop at Princeton PCTS, 2024
- Panelist, Princeton Navigating the Tenure Track discussion, 2023
- Lead organizer, "Space the final frontier of microbial communities" workshop at Princeton PCTS, 2023
- Lead organizer, "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, "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, "Biologic and soft materials" session at Princeton PRISM Research Symposium, 2019
- Leader organizer, "Transport in Disordered Environments" workshop at Princeton PCTS, 201

## **Awards/Honors to Advisees Based on Work Under my Advisement**

- November 2024: Emily Chen, 2024 AIChE Excellence in Fluid Mechanics Research and Oral Presentation Award
- May 2024: Callie Zheng, Outstanding Materials Science Student, Princeton
- September 2023: Alejandro Martínez Calvo, John Archibald Wheeler Fellowship, Princeton
- June 2023: Sebastian Gonzalez La Corte, 2023 Colloid and Interface Symposium at U. Penn Poster Award
- March 2023: Hao Nghi Luu, NSF GRFP Award
- March 2023: Emily Chen, Honorable Mention, NSF GRFP
- March 2023: Carolina Trenado Yuste, Damon Runyon Quantitative Biology Fellowship
- January 2023: Carolina Trenado Yuste, Gordon Research Seminar Outstanding Presentation Award
- January 2023: Carolina Trenado Yuste, Aspen Center for Physics Martin & Beate Block Award
- January 2023: Sebastian Gonzalez La Corte, Aspen Center for Physics Poster Award
- December 2022: Sebastian Gonzalez La Corte, APS DBIO Travel Award
- 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, PBI<sup>2</sup> 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 Honoric 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 Eddebuettel 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 GSOFIT 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