

# DANIEL M. SUSSMAN

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(Updated September 12, 2024)

## CURRENT POSITION

- **Emory University**, Atlanta, GA  
Assistant Professor, Department of Physics  
September 2019 - present  
Mathematics and Science Center, Room N212  
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## OTHER CURRENT AFFILIATIONS

- **Emory Theory and Modeling of Living Systems Initiative**, Atlanta, GA  
Member (2019 - present)
- **Winship Cancer Institute**, Atlanta, GA  
Associate Member (2022 - present)

## EDUCATION

- **Doctor of Philosophy** in Physics  
University of Illinois at Urbana-Champaign, Urbana, IL, 2012  
**Thesis:** Theories of slow dynamics: From glassy colloidal suspensions to entangled macromolecular liquids  
**Mentor:** Kenneth S. Schweizer
- **Bachelor of Arts** in Mathematics and with Highest Honors in Physics  
Williams College, Williamstown, MA 2007  
**Honors Thesis:** Minimum-uncertainty states and rotational invariance in discrete phase space  
**Mentor:** William K. Wootters

## PREVIOUS ACADEMIC POSITIONS

- **Syracuse University**, Syracuse, NY  
Research Associate; Department of Physics  
September 2016 - August 2019  
**Mentors:** Lisa Manning, Cristina Marchetti, Jennifer Schwarz
- **University of Pennsylvania**, Philadelphia, PA  
Postdoctoral Fellow; Department of Physics  
September 2012 - August 2016  
**Mentors:** Randall Kamien, Andrea Liu

## RESEARCH

### PUBLICATIONS

An update-to-date publication list with citation information/statistics can be found on my [Google Scholar page](#) [link].

*Underlined names are students/postdocs from Emory University. The † symbol indicates corresponding author status related to work done during my time at Emory University. The horizontal line in the “Published peer-reviewed research” section separates work primarily done before vs after joining Emory.*

#### Submitted manuscripts and preprints:

- C. R. Packard and **D. M. Sussman**<sup>†</sup>; “Banded phases in topological flocks,” [\[arXiv link\]](#)
- H. S. Ansell, C. Li, and **D. M. Sussman**<sup>†</sup>; “Tunable glassy dynamics in models of dense cellular tissue,” [\[arXiv link\]](#)

- H. Yue, C. R. Packard, and D. M. Sussman<sup>‡</sup>; “Scale-dependent sharpening of interfacial fluctuations in shape-based models of dense cellular sheets,” [\[arXiv link\]](#)
- T. H. Webb and D. M. Sussman<sup>‡</sup>; “*curvedSpaceSim*: A framework for simulating particles interacting along geodesics,” [\[arXiv link\]](#)
- D. M. Sussman<sup>‡</sup>; “Non-metric interaction rules in models of active matter” *To appear as a book chapter at the conclusion of the Marie-Curie ITN on Active Matter*

#### Published peer-reviewed research:

43. C. R. Packard, S. Unnikrishnan, S. Phuyal, S. H. Cheong, M. L. Manning, C.-K. Tung, and D. M. Sussman<sup>‡</sup>; “Self-organized vortex phases and hydrodynamic interactions in *Bos taurus* sperm cells” *Phys. Rev. E*, **110**, 014407 (2024)
  42. H. Yue, J. C. Burton, and D. M. Sussman<sup>‡</sup>; “Coalescing Clusters Unveil New Regimes of Frictional Fluid Mechanics” *Phys. Rev. R*, **6**, 023115 (2024)
  41. T. M. Obadiya and D. M. Sussman<sup>‡</sup>; “Using fluid structures to encode predictions of glassy dynamics?” *Phys. Rev. R* **5**, 043112 (2023)
  40. Y. Jiang, D. M. Sussman, E. R. Weeks; “Effects of polydispersity on the plastic behaviors of dense 2D granular systems under shear” *Phys. Rev. E* **108**, 054605 (2023)
  39. D. E. P. Pinto, D. M. Sussman<sup>‡</sup>, M. M. Telo da Gama, and N. A. M. Araujo; “Hierarchical structure of the energy landscape in the Voronoi model of dense tissue” *Phys. Rev. R* **4**, 023187 (2022)
  38. T. Yamamoto, D. M. Sussman, T. Shibata, and M. L. Manning; “Non-monotonic fluidization generated by fluctuating edge tensions in confluent tissues” *Soft Matter* **18**, 2168 (2022)
  37. J. Devany, D. M. Sussman, T. Yamamoto, M. L. Manning, and M. L. Gardel; “Cell division Rate Controls Cell Shape Remodeling in Epithelia” *Proc. Natl. Acad. Sci. USA* **118**, e1917853118 (2021)
  36. I. Tah, T. A. Sharp, A. J. Liu, and D. M. Sussman<sup>‡</sup>; “Quantifying the link between local structure and cellular rearrangements using information in models of biological tissues” *Soft Matter* **17**, 10242 (2021)
  35. S. Grosser, J. Lippoldt, L. Oswald, M. Merkel, D. M. Sussman, F. Renner, P. Gottheil, E. W. Morawetz, T. Fuhs, X. Xie, S. Pawlizak, A. W. Fritsch, B. Wolf, L.-C. Horn, S. Briest, B. Aktas, M. L. Manning, and J. A. Käs; “Cell and Nucleus Shape as an Indicator of Tissue Fluidity in Carcinoma” *Phys. Rev. X* **11**, 011033 (2021)
  34. D. M. Sussman<sup>‡</sup>; “Interplay of curvature and rigidity in shape-based models of confluent tissue” *Phys. Rev. R* **2**, 023417 (2020)
  33. P. Sahu, D. M. Sussman, M. Rübsam, A. F. Mertz, V. Horsley, E. R. Dufresne, C. M. Niessen, M. C. Marchetti, M. L. Manning, and J. M. Schwarz; “Small-scale demixing in confluent biological tissues” *Soft Matter* **16**, 3325 (2020)
  32. D. M. Sussman<sup>‡</sup> and D. A. Beller; “Fast, scalable, and interactive software for Landau-de Gennes numerical modeling of nematic topological defects” *Frontiers in Physics* **7**, 204 (2019)
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31. M. Czajkowski, D. M. Sussman, M. C. Marchetti, and M. L. Manning; “Glass dynamics in models of confluent tissue with mitosis and apoptosis” *Soft Matter* **15**, 9133 (2019)
  30. A. Patch, D. M. Sussman, D. Yllanes, and M. C. Marchetti; “Curvature-dependent tension and tangential flows at the interface of motility-induced phases” *Soft Matter* **14**, 7435 (2018)
  29. D. M. Sussman and M. Merkel; “No unjamming transition in a Voronoi model of biological tissue” *Soft Matter* **14**, 3397 (2018)
  28. D. M. Sussman, M. Paoluzzi, M. C. Marchetti, and M. L. Manning; “Anomalous glassy dynamics in simple models of dense biological tissue” *Europhysics Letters* **121**, 36001 (2018)
  27. D. M. Sussman, J. M. Schwarz, M. C. Marchetti, and M. L. Manning; “Soft yet sharp interfaces in a vertex model of confluent tissue” *Phys. Rev. Lett.* **120**, 058001 (2018)  
Editors’ suggestion. See also a synopsis in *Physics* and *Physics World*
  26. D. M. Sussman, S. S. Schoenholz, E. D. Cubuk, and A. J. Liu; “Disconnecting structure and dynamics in glassy thin films” *Proc. Natl. Acad. Sci. USA* **114**, 10601 (2017)
  25. D. M. Sussman; “cellGPU: massively parallel simulations of dynamic vertex models” *Computer Physics Communications* **219**, 400 (2017)

24. K. S. Schweizer and **D. M. Sussman**; "A Force-Level Theory of the Rheology of Entangled Rod and Chain Polymer Liquids," *J. Chem. Phys.* **145**, 214903 (2016)
23. T. Castle, **D. M. Sussman**, M. Tanis and R. D. Kamien; "Additive lattice kirigami," *Sci. Adv.* **2**, e1601258 (2016)
22. **D. M. Sussman**; "Spatial distribution of entanglements in thin free-standing films," *Phys. Rev. E* **94**, 012503 (2016)
21. **D. M. Sussman**, O. Stenull, and T. C. Lubensky; "Topological boundary modes in jammed matter," *Soft Matter* **12**, 6079 (2016)
20. S. S. Schoenholz, E. D. Cubuk, **D. M. Sussman**, E. Kaxiras, and A. J. Liu; "A structural approach to relaxation in glassy liquids," *Nature Physics* **12**, 469 (2016)
19. **D. M. Sussman**, C. P. Goodrich, and A. J. Liu; "Spatial organization of states of self-stress in jammed systems," *Soft Matter* **12**, 3982 (2016)
18. **D. M. Sussman**, S. S. Schoenholz, Y. Xu, T. Still, A. G. Yodh, and A. J. Liu; "Strain fluctuations and elastic moduli in disordered solids," *Phys. Rev. E* **92**, 022307 (2015)
17. **D. M. Sussman**, Y. Cho, T. Castle, X. Gong, E. Jung, S. Yang, and R. D. Kamien; "Algorithmic Lattice Kirigami: A Route to Pluripotent Materials," *Proc. Natl. Acad. Sci.* **112**, 7449 (2015)  
*See also a commentary* on this paper at the Condensed Matter Journal Club.
16. **D. M. Sussman**, C. P. Goodrich, A. J. Liu, and S. R. Nagel; "Disordered surface vibrations in jammed sphere packings," *Soft Matter* **11**, 2745 (2015)
15. I. Amburg, R. Sharma, **D. M. Sussman**, and W. K. Wootters; "States that "look the same" with respect to every basis in a mutually unbiased set," *J. Math. Phys.* **55**, 122206 (2014)
14. T. Castle, Y. Cho, X. Gong, E. Jung, **D. M. Sussman**, S. Yang, and R. D. Kamien; "Making the Cut: Lattice Kirigami Rules," *Phys. Rev. Lett.* **113**, 245502 (2014)
13. M. A. Lohr, R. Ganit, T. Still, M. D. Gratale, K. B. Aptowicz, C. P. Goodrich, **D. M. Sussman**, and A. G. Yodh; "Vibrational and Structural Signatures of the Crossover Between Dense Glassy and Sparse Gel-Like Attractive Colloidal Packings," *Phys. Rev. E* **90**, 062305 (2014)
12. **D. M. Sussman**, W.-S. Tung, K. I. Winey, K. S. Schweizer, and R. A. Riggleman; "Entanglement Reduction and Anisotropic Chain and Primitive Path Conformations in Polymer Melts Under Thin Film and Cylindrical Confinement," *Macromolecules* **47**, 6462 (2014)
11. D. A. Beller, T. Machon, S. Čopar, **D. M. Sussman**, G. P. Alexander, R. D. Kamien, and R. A. Mosna; "The Geometry of the Cholesteric Phase," *Phys. Rev. X* **4**, 031050 (2014)
10. **D. M. Sussman** and K. S. Schweizer; "Entangled polymer chain melts: Orientation and deformation dependent tube confinement and interchain entanglement elasticity," *J. Chem. Phys.* **139**, 234904 (2013)
9. **D. M. Sussman** and K. S. Schweizer; "Entangled Rigid Macromolecules Under Continuous Startup Shear Deformation: Consequences of a Microscopically Anharmonic Confining Tube," *Macromolecules* **46**, 5684 (2013)
8. **D. M. Sussman** and K. S. Schweizer; "Microscopic theory of Entangled Polymer Melt Dynamics: Flexible Chains as Primitive-Path Random Walks and Supercoarse Grained Needles," *Phys. Rev. Lett.* **109**, 168306 (2012)
7. **D. M. Sussman** and K. S. Schweizer; "Space-time correlated two-particle hopping in glassy fluids: Structural relaxation, irreversibility, decoupling, and facilitation," *Phys. Rev. E* **85**, 061504 (2012)
6. **D. M. Sussman** and K. S. Schweizer; "Microscopic Theory of Quiescent and Deformed Topologically Entangled Rod Solutions: General Formulation and Relaxation after Nonlinear Step Strain," *Macromolecules* **45**, 3270 (2012)
5. **D. M. Sussman** and K. S. Schweizer; "Communication: Effects of stress on the tube confinement potential and dynamics of topologically entangled rod fluids," *J. Chem. Phys.* **135**, 131104 (2011)
4. **D. M. Sussman** and K. S. Schweizer; "Microscopic theory of the tube confinement potential for liquids of topologically entangled rigid macromolecules," *Phys. Rev. Lett.* **107**, 078102 (2011)
3. **D. M. Sussman** and K. S. Schweizer; "Microscopic theory of topologically entangled fluids of rigid macromolecules," *Phys. Rev. E* **83**, 061501 (2011)
2. **D. M. Sussman** and K. S. Schweizer; "Theory of correlated two-particle activated glassy dynamics: General formulation and heterogeneous structural relaxation in hard sphere fluids," *J. Chem. Phys.* **134**, 064516 (2011)

1. W. K. Wootters and **D. M. Sussman**; "Discrete phase space and minimum uncertainty States," *Proceedings of the Eighth International Conference on Quantum Communication, Measurement and Computing*, pp. 269-274, NICT Press (2007)

## OTHER SCHOLARLY PRODUCTS

### Major open-source software packages:

- "open-Qmin" [[GitHub link](#) and [Zenodo record](#)]; Role: Lead developer  
*MPI and GPU-accelerated simulations of lattice-based liquid crystal models within the Landau-de Gennes Q-tensor framework. Roughly 27000 lines of code and auto-documenting comments.*
- "cellGPU" [[GitHub link](#) and [Zenodo record](#)]; Role: Lead developer  
*GPU-accelerated simulations of a broad class of models of dense cellular matter. Roughly 19000 lines of code and auto-documenting comments.*
- "dDimensionalSimulation" [[GitHub link](#) and [Zenodo record](#)]; Role: Sole developer  
*Platform for conducting efficient particle-based simulations in arbitrary dimension. Roughly 16000 lines of code and auto-documenting comments.*

## RESEARCH SUPPORT

### Current:

- "CAREER: Dynamics and thermodynamics of ultra-strong glassformers"  
National Science Foundation (Role: PI)  
\$656,350, 2022-2027 (*plus \$41,928 Supplement, 2023*)

### Pending:

- "Unraveling Biophysical Mechanisms for Swarm-Biofilm Transition in *Proteus mirabilis*"  
NIH R01; submitted 2024 (Role: Co-I)
- "Polymer dynamics across dimensions"  
ACS PRF New Directions; submitted 2023 (Role: PI)

### Completed:

- "The effect of non-reciprocal interactions on emergent leader-follower cell dynamics in tumor metastasis"  
Winship Cancer Institute Pilot Project Program (Role: PI, Co-I: Adam Marcus)  
\$50,000, 2023-2024

## HONORS AND AWARDS

- NVIDIA Academic Partnership Program (2015, 2016, 2019)
- Group on Statistical and Nonlinear Physics Postdoctoral Speaker Award (finalist) (2018)
- American Philosophical Society Fellowship in Advanced Materials (2014-2016)
- Williams College "Class of 1960 Scholar" (2007)

## INVITED TALKS

### Invited Conference and Workshop Talks: (23 total, 12 since joining Emory)

- *Flows, flocking, and unusual hydrodynamics in active and living soft matter*, Banff International Research Station: Mathematical Analysis of Soft Matter, July 2024
- *What we talk about when we talk about modeling dense cellular matter*, Georgia Tech: Soft Matter Day Workshop, April 2024
- *Non-metric interaction rules in soft and living matter*, APS March Meeting, March 2023
- *From Cells to Swarms: How Does Living Matter Self-Organize?*, AAAS Annual Meeting, March 2023

- *Inferring structural signatures of glassy rearrangements from liquid-state dynamics*, Simons “Cracking the Glass Problem” Workshop series (online), June 2022
  - *Inferring plasticity in an anomalous “glass-forming” material*, CECAM Workshop: Local structure meets machine learning in soft matter systems, Lausanne, Switzerland, June 2021
  - *Shapes on a plane: mechanical properties of geometric models of tissue*, APS March Meeting, March 2021
  - *Non-metric interaction rules in models of active matter*, Marie Skłodowska-Curie Training Network Workshop: Numerical methods in active matter, January 2021
  - *What we talk about when we talk about modeling tissue*, Princeton Center for Theoretical Science: Physics of Living Matter Workshop, January 2021
  - *Active vertex models of epithelial tissue* CECAM Workshop: Frontiers in Computational Methods for Active Matter, Lausanne, Switzerland, February 2020
  - *Unusual Glassy Behavior of a Biologically Inspired Glass Former*, Southeastern Section APS Meeting: UNC Wilmington, November 2019
  - *Anomalous bulk and boundary behavior in simple models of dense biological tissue*, Soft Matter Symposium 2019: University of Florida, October 2019
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- *Glassy dynamics and rigidity transitions in simple models of dense tissue*, 4th International Conference on Packing Problems: Yale University, June 2019
  - *Anomalous interfaces in simple models of dense biological tissue*, Conference on Non-Equilibrium Systems (CONES 2018): King's College London, June 2018
  - *Marginal rigidity and anomalous interfaces in models of dense biological tissue*, Geometry of Soft Matter Workshop, Natal, Brazil, May 2018
  - *Tissue surface tension and rigidity in simple models of dense biological tissues*, 8th Physics of Cancer symposium: Leipzig, Germany, October 2017
  - *A force-level theory of the rheology of entangled polymer liquids*, 8th International Discussion Meeting on Relaxations in Complex Systems, Wisla, Poland, July 2017
  - *Algorithmic Lattice Kirigami*, ICERM workshop: Unusual Configuration Spaces, Brown University, September 2016
  - *Structure and dynamics in bulk and thin-film glasses*, Simons Collaboration on Cracking the Glass Workshop: University of Chicago, June 2016
  - *Algorithmic Lattice Kirigami*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, May 2016
  - *Kirigami in architecture, technology, and science*, NSF EFRI-ODISSEI Workshop on Origami Design, Florida International University, February 2016
  - *Algorithmic Lattice Kirigami*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, August 2015
  - *Topological constraints in entangled polymer melts*, 7th International Discussion Meeting on Relaxations in Complex Systems, Barcelona, Spain, July 2013

**Invited Departmental Seminars/Colloquia:** (30 total, 7 since joining Emory)

- *Physical models of dense cellular materials*, Seminar (CBE): The Ohio State University, August 2024
- *Physical models of dense cellular matter*, Colloquium (Physics): University of South Florida, November 2023
- *Modeling dense cellular matter*, Seminar (Material Science and Biophysics): Augusta University, November 2023
- *Nonreciprocal forces and exceptional phase transitions in models of flocking*, Colloquium (Physics): McMaster University, Canada, November 2022
- *Dynamics and thermodynamics in geometric models of living matter*, Seminar (Laboratoire Matière et Systèmes complexes): Université de Paris, France, June 2021
- *Unusual interfaces and anomalous glassy behavior in biological matter*, Seminar (Physics of Complex Systems): École Polytechnique Fédérale de Lausanne, Switzerland, February 2020

- *Unusual Glassy Behavior of a Biologically Inspired Glass Former*, Seminar (Soft Condensed Matter): Georgia Institute of Technology, November 2019
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- *Anomalous interfaces in biological matter*, Seminar (Materials Science): University of Illinois, February 2019
  - *Anomalous interfaces in biological matter*, Colloquium (Physics): Virginia Tech, February 2019
  - *Anomalous interfaces in biological matter*, Seminar (Physics): Emory University, January 2019
  - *Anomalous bulk and boundary behavior in dense biological tissue*, Seminar (Bioengineering): Stanford University, September 2018
  - *Anomalous bulk and boundary behavior in dense biological tissue*, Seminar (Physics): University of California Merced, September 2018
  - *Anomalous bulk and boundary behavior in dense biological tissue*, Seminar (Pharmaceutical Chemistry): University of California San Francisco
  - *Disconnecting structure and dynamics in glassy thin films*, Colloquium (Computer Science): University of Oregon, March 2018
  - *Unexpected surface tension and rigidity in simple models of dense biological tissues*, Colloquium (Physics): North Carolina A&T, March 2018
  - *Marginal rigidity and anomalous interfaces in models of dense biological tissue*, Seminar (Soft and Bio Matter): Leiden University, The Netherlands, October 2017
  - *Marginal rigidity and anomalous interfaces in models of dense biological tissue*, Seminar (Bionanoscience): TU Delft, The Netherlands, October 2017
  - *Marginal rigidity and anomalous interfaces in models of dense biological tissue*, Seminar (Theory of Polymers and Soft Matter): TU Eindhoven, The Netherlands, October 2017
  - *Tissue surface tension and rigidity in simple models of dense biological tissues*, Seminar (Soft matter physics): Leipzig University, July 2017
  - *Disconnecting structure and dynamics in glassy thin films*, Seminar (Kavli Institute for Bionano Science and Technology): Harvard University, May 2017
  - *The geometry and topology of granular matter*, Seminar (Physics): Syracuse University, April 2017
  - *Disconnecting structure and dynamics in glassy thin films*, Seminar (Physics): Emory University, April 2017
  - *Disconnecting structure and dynamics in polymer thin films*, Seminar (Physics): Northwestern University, December 2016
  - *Machine learning at the surface of glassy thin films*, Seminar (MRSEC IRG): University of Pennsylvania, December 2016
  - *Disconnecting structure and dynamics in polymer thin films*, Colloquium (Physics) Emory University, November 2016
  - *The geometry and topology of granular matter*, Colloquium (Physics): University of Vermont, February 2016
  - *Geometry and topology in computational soft matter*, Colloquium (Physics): Haverford College, February 2016
  - *Topological constraints in entangled polymer melts*, Seminar (Soft matter physics): University of Massachusetts Amherst, July 2014
  - *Topological entanglement in polymer liquids*, Seminar (Soft matter physics): University of Pennsylvania, November 2011
  - *Theory of topological entanglement in polymer liquids*, Seminar (Center for Integrated Nanotechnologies): Sandia National Laboratories, August 2011

## CONTRIBUTED CONFERENCE PRESENTATIONS

*Underlined names are Sussman Lab student and postdoc presentations*

**Contributed conference presentations:** (36 total, 15 since joining Emory)

- T. Obadiya and **D. M. Sussman**, “Physical interpretability of machine learning methods: learning energy barriers from local structures in supercooled fluids”, American Physical Society March Meeting, March 2024
- C. Li and **D. M. Sussman**, “Temperature-dependent shear moduli in shape-based models of dense tissue”, American Physical Society March Meeting, March 2024
- T. H. Webb and **D. M. Sussman**, “Modeling collective dynamics of biological systems in curved space”, American Physical Society March Meeting, March 2024
- H. Yue, and **D. M. Sussman**, “Long-Wavelength Interface Fluctuations Between Different Cell Populations are Suppressed by Friction”, American Physical Society March Meeting, March 2024
- H. Yue, J. Burton, and **D. M. Sussman**, “Coalescing Clusters Unveil New Regimes of Frictional Fluid Mechanics”, *Invited talk*, American Physical Society March Meeting, March 2023
- T. Obadiya and **D. M. Sussman**, “Does fluid structure encode predictions of glassy dynamics?”, American Physical Society March Meeting, March 2023
- C. R. Packard and **D. M. Sussman**, “Non-reciprocal forces and exceptional phase transitions in metric and topological flocks”, American Physical Society March Meeting, March 2023
- C. R. Packard and **D. M. Sussman**, “Non-Reciprocity in Metric and Topological Models of Flocking”, American Physical Society March Meeting, March 2022
- H. Yue, J. Burton, and **D. M. Sussman**, “Non-liquid behavior of coalescing droplets of liquid-like cellular aggregates”, American Physical Society March Meeting, March 2022
- H. Yue, J. Burton, and **D. M. Sussman**, “Non-liquid dynamics during the coalescence of colloidal and cellular aggregates”, American Physical Society Division of Fluid Dynamics Meeting, November 2021
- P. Yanka, J. L. Lyles, D. N. Rattigan, O. Damavandi, **D. M. Sussman**, M. L. Manning, and C.-K. Tung “Analysis of a Self-Propelled Particle Model for Understanding Flocking Transition in Sperm”, American Physical Society March Meeting, March 2021
- I. Tah, T. Sharp, A. J. Liu, and **D. M. Sussman**, “Assessing the connection between cellular rearrangements and local structure using information in models of biological tissues”, American Physical Society March Meeting, March 2021
- **D. M. Sussman** “Cells on spheres: glassy dynamics of vertex models in curved space”, American Physical Society March Meeting, March 2020
- J. L. Lyles, P. Yanka, C.-K. Tung, **D. M. Sussman**, and M. L. Manning “Flocking Transition in a Self-propelled Particle Model Using Experimental Motility Conditions”, American Physical Society March Meeting, March 2020
- A. Oduor, Y. Bililign, **D. M. Sussman**, S. H. Cheong, M. L. Manning, and C.-K. Tung, “Comparing sperm collective swimming with flocking transition”, American Physical Society March Meeting, March 2020

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- **D. M. Sussman**, J. Devany, M. Gardel, and M. L. Manning, “Dynamical correlation lengths in shape-based models of confluent tissue”, American Physical Society March Meeting, March 2019
- J. Devany, **D. M. Sussman**, M. Gardel, and M. L. Manning, “Cell Shape Dependent Motility During the Establishment of Tissue Structure”, American Physical Society March Meeting, March 2019
- A. Patch, D. Yllanes, **D. M. Sussman**, and M. C. Marchetti, “Curvature-dependent tension and tangential flows at the interface of motility-induced phases”, American Physical Society March Meeting, March 2019
- M. Czajkowski, **D. M. Sussman**, M. C. Marchetti, and M. L. Manning, “Glassy Dynamics in a Simulated Cell Monolayer with Division and Death”, American Physical Society March Meeting, March 2019
- **D. M. Sussman**, “Unexpected Tissue Surface Tension in Simple Models of Dense Biological Tissues”, American Physical Society March Meeting, March 2018.
- **D. M. Sussman**, “Soft but sharp interfaces in vertex models of confluent tissue”, Gordon Research Conference: Soft Matter, August 2017
- **D. M. Sussman**, “Disconnecting structure and dynamics in glassy thin films”, American Physical Society March Meeting, March 2017

- **D. M. Sussman**, “ Topological boundary modes in jammed matter”, American Physical Society March Meeting, March 2016
- **D. M. Sussman**, “Algorithmic Lattice Kirigami”, Gordon Conference: Soft Matter, August 2015
- **D. M. Sussman**, “Structural length scales in glassy thin films from machine learning”, Gordon Research Conference: Liquids, August 2015
- **D. M. Sussman**, “Disordered surface vibrations in jammed sphere packings”, American Physical Society March Meeting, March 2015
- **D. M. Sussman**, “Disordered surface vibrations in jammed sphere packings”, Aspen workshop: Unifying Concepts in Glass Physics VI, February 2015
- **D. M. Sussman**, “Orientational Order and the Entanglement Density of Polymers ”, Gordon Research Conference: Polymer Physics, July 2014
- **D. M. Sussman**, “Vibrational Modes at the Surface of Jammed Packings”, ACS Colloids, June 2014
- **D. M. Sussman**, “Soft Spots in Amorphous Thin Films”, American Physical Society March Meeting, March 2014
- **D. M. Sussman**, “Entanglement elasticity in polymer chain melts”, American Physical Society March Meeting, March 2013
- **D. M. Sussman**, “Microscopic theory of the tube confinement potential”, American Physical Society March Meeting, March 2012
- **D. M. Sussman**, “Microscopic theory of the dynamic tube confinement potential”, Society of Rheology, October 2011
- **D. M. Sussman**, “Theories of slow dynamics”, Gordon Research Conference: Liquids, July 2011
- **D. M. Sussman**, “Microscopic theory of topological entanglement constraints”, American Physical Society March Meeting, March 2011
- **D. M. Sussman**, “Microscopic Statistical Dynamical Theory of Correlated Motion”, American Physical Society March Meeting, March 2010

## TEACHING

### GRADUATE COURSES TAUGHT AT EMORY

- Physics 504: **Collective and Emergent Phenomena**  
Spring 2024
- Physics 526: **Statistical Physics**  
Spring 2020, Spring 2021, Spring 2022, & Spring 2023

### UNDERGRADUATE COURSES TAUGHT AT EMORY

- Physics 121: **How Things Work**  
Fall 2020
- Physics 151: **Physics for Scientists and Engineers I**  
Fall 2022

### SUMMER SCHOOLS AND WORKSHOPS

- Lectured and created a tutorial on numerical methods associated with topological neighbor relations for the Marie Skłodowska-Curie Training Network Workshop: Numerical methods in active matter course (January 2021)



## TEACHING EXPERIENCE PRIOR TO EMORY

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|--|--|-------------------------|
| <b>Guest Lecturer</b><br><i>Physics Department</i><br><i>Ad hoc guest lecturer for PHYS 170: Honors Physics</i>  | University of Pennsylvania<br>Philadelphia, PA           | Fall 2012               |
| <b>Teaching Assistant</b><br><i>Physics Department</i><br><i>Led multiple recitation sections of PHYS 101: College Physics. Recognized as "Outstanding" on the university's List of Teachers Ranked as Excellent by Their Students</i> | University of Illinois at Urbana-Champaign<br>Urbana, IL | Fall 2007 - Spring 2008 |
| <b>Teaching Assistant</b><br><i>Physics and Mathematics Departments</i><br><i>Teaching assistant for multiple undergraduate courses at the sophomore - senior levels</i>   | Williams College<br>Williamstown, MA                     | Fall 2004 - Spring 2007 |

## PUBLIC OUTREACH

- "Ice Cream Science" – public demonstration on the soft matter physics of ice cream, in partnership with Science for Georgia and the Atlanta Science Festival, Decatur, GA (March 2022, 2023)
- "Is Ice Cream a Solid? Liquid? Glass?" – public demonstration on the soft matter physics of ice cream, in partnership with Science for Georgia, Decatur, GA (June 2021)

## POSTDOCTORAL MENTEES

- Haicen Yue (2020 - 2023)  
Starting Fall 2023: Assistant Professor at the University of Vermont
- Helen Ansell (2023 - present)

## GRADUATE MENTEES

### Research Group members

- Charles Packard, PhD Candidate, Physics (2020 - )
- Tomilola Obadiya, PhD Candidate, Physics (2020 - )
- Toler Webb, PhD Candidate, Physics (2021 - )
- Chengling Li, PhD Candidate, Physics (2022 - )

### Rotation Students

- |                                    |                                 |
|------------------------------------|---------------------------------|
| ▪ Charles Packard (Physics, 2019)  | ▪ Rajpreet Kaur (Physics, 2020) |
| ▪ Enes Suyabatmaz (Physics, 2019)  | ▪ Toler Webb (Physics, 2021)    |
| ▪ Tomilola Obadiya (Physics, 2020) | ▪ Chengling Li (Physics, 2022)  |

## UNDERGRADUATE RESEARCH MENTEES

- Fardeen Kawsar, Emory University (Class of 2026)
- Claudia Schmidt, Emory University (Class of 2025)
- Vicky Liu, Emory University (Class of 2022)  
Starting Fall 2023: Biomedical Engineering Ph.D. Program, Washington University in St. Louis
- Christian Randolph, North Carolina A&T (Class of 2023)
- Sumedh Khanolkar, Emory University (Class of 2023)  
Starting Fall 2024: Researcher at Johns Hopkins Applied Physics Lab

## GRADUATE COMMITTEE MEMBER

**Thesis Committee:** (14 students)

- Yixuan Han (Ph.D. 2022)
- Yannic Gagnon (Ph.D. 2022)
- Kavinda Nissanka (Ph.D. 2024)
- Josuan Calderon (Ph.D. 2024)
- Eslam Abdelaleem (Ph.D. 2024)
- Cordell Donofrio
- James Merrill
- Arabind Swain
- Emma Dawson
- Alex Couturier
- Michelle Wang
- Tao Jin
- David Meer
- Rajpreet Kaur
- Sahand Emamian (MS 2022)
- Yuanbo Song (MS 2024)

**Emory Physics Qualifier Committee (23 students)**

- Emma Dawson (2020)
- James Merrill (2020)
- Kavinda Nissanka (2020)
- Arabind Swain (2020)
- Cordell Donofrio (2020)
- Sergei Ivanov (2020)
- Sahand Emamian (2020)
- Tomilola Obadiya (2021)
- Charles Packard (2021)
- Lakshmi Pullasserri Madom Narayana (2021)
- Tao Jin (2021)
- Eslam Abdelaleem (2021)
- Toler Webb (2022)
- Rajpreet Kaur (2022)
- Michelle Wang (2022)
- Alex Couturier (2022)
- David Meer (2023)
- Chengling Li (2023)
- Zehui Zhao (2023)
- Mateusz Szurek (2023)
- Ketuna Danelia (2023)
- Yuanbo Song (2023)
- Aishwarya Ganesh (2024)
- Sarita Yadav (2024)
- Pedro de Castro (2024)

**UNDERGRADUATE COMMITTEE MEMBER**

**Honors Thesis Committee: (2 student)**

- Nandish Vora, 2023
- Ginger Lau, 2024

**SERVICE**

**COMMITTEE-BASED SERVICE**

**Emory University:**

- Ad hoc reviewer, University Research Committee (2020)

**Emory College of Arts and Sciences:**

- Chair, Physics Department Assistant Faculty Mentoring Group (2024-current)
- Member, Emory College Honor Council (2022- 2024)
- Member, Biology Department Faculty Search Committee (2023-2024)
- Member, Physics Department Faculty Search Committee in Statistical Physics & AI (2022-2023)
- Member, Computational Research Advisory Steering Committee (2022-2025)
- Reported Student Advisor, Emory College Honor Council (2021 - 2022)

**Laney Graduate School:**

- Member, Physics Graduate Program Curriculum Committee (2021 - current)
- Ad hoc committee member, LGS Honor Code Grievance Committee (2021)
- Member, Physics Graduate Program Matching Committee (2019 - 2021)
- Member, Physics Graduate Program Admissions Committee (2019 - 2022)

## PROFESSIONAL AFFILIATIONS

- American Physical Society (2010 - current)
  - Division of Soft Matter; Division of Biological Physics; Topical Group on Statistical and Nonlinear Physics
- American Chemical Society (2018 - 2021)

## JOURNAL REVIEWS

*Over 88 manuscripts, including papers from:* ACS Central Science, ACS Macro Letters, Biophysical Journal, Extreme Mechanics Letters, Journal of Chemical Physics, Journal of Rheology, Journal of Physical Chemistry, Macromolecules, Nature Communications, Nature Physics, New Journal of Physics, Physica A, Physical Review E, Physical Review Letters, Physical Review Materials, Physical Review Research, Physical Review X, PLOS Computational Biology, Science Advances, Scientific Reports, Soft Matter

## GRANT REVIEWS

- National Science Foundation (Condensed Matter and Materials Theory)
- American Chemical Society (Petroleum Research Fund)
- Research Corporation for Science Advancement (Cottrell Scholar Grants)
- NWO [*Dutch Research Council*] (Talent Programme: Vici grants for senior researchers)

## CONFERENCES/PROGRAMS/SESSIONS ORGANIZED or CO-ORGANIZED

- “Non-reciprocity in soft and active matter” *Focus Session*, American Physical Society March Meeting, 2025
- “The many faces of active mechanics,” Kavli Institute for Theoretical Physics conference, Fall 2024
- “Active Solids: from metamaterials to biological tissue,” Kavli Institute for Theoretical Physics program, Fall 2024
- “Non-reciprocity in soft and active matter” *Focus Session*, American Physical Society March Meeting, 2024
- “Non-reciprocity in soft and active matter” *Focus Session*, American Physical Society March Meeting, 2023
- “Non-reciprocity in soft and active matter” *Invited Session*, American Physical Society March Meeting, 2022
- “(What) Can Soft Matter Physics Teach Us About Biological Function?” *Virtual Workshop*, Emory Theory and Modeling of Living Systems, 2020
- “Fundamentals of Macromolecular Glasses” *Symposium*, ACS National Meeting, 2020
- “Producing Equilibrium Amorphous Packings” *Symposium*, ACS National Meeting, 2019

Dated: September 12, 2024