ORIT PELEG

University of Colorado at Boulder
Department of Computer Science
BioFrontiers Institute
3415 Colorado Avenue, Boulder, CO 80303, USA

+1 303–735–8505
www.peleglab.com
orit.peleg@colorado.edu

Research Interests

My research is aimed at understanding how biological communication signals are generated and interpreted. While the channel may change - whether chemical, sound, or light - the living creatures of our world all encode high dimensional biological features into low-dimensional communication patterns. I use insect swarms as a model system for identifying how organisms harness the dynamics of communication signals, perform spatiotemporal integration of these signals, and propagate those signals to neighboring organisms. Examples include fireflies who communicate over long distances using light signals, and bees who serve as signal amplifiers to propagate pheromone-based information about the queen's location.

Academic Appointments

University of Colorado at Boulder, USA – 2018–Present
Assistant Professor at the Dept. of Computer Science and at the Biofrontiers Institute
Affiliated Faculty at the Dept. of Physics, Applied Math, and Ecology and Evolutionary Biology

Santa Fe Institute, USA – 2019–Present
External Professor

Harvard University, USA – 2014–2017
Postdoctoral Fellow at the John A. Paulson School Of Engineering And Applied Sciences, Advisor: Prof. L. Mahadevan

Harvard University, USA – 2012–2013
Postdoctoral Fellow at the Department of Chemistry and Chemical Biology
Advisor: Prof. E. Shakhnovich

ETH Zürich and University of Zürich, Switzerland – 2012
Research assistant at the Institute of Neuroinformatics
Advisor: Prof. R. Hahnloser

Education

PhD in Materials Science, ETH Zürich, Switzerland – 2008–2012
Thesis title: "Simple Models of Competitive Interactions in Biophysical Systems" advised by Prof. Martin Kröger, Prof. Viola Vogel and Prof. Yitzhak Rabin

MSc degree in Physics, Bar–Ilan University, Israel, ***summa cum laude*** – 2006–2007
Thesis title: "Simple Model of Microphase Separation in Polymer Gels; Molecular Dynamics Approach" advised by Prof. Yitzhak Rabin

BSc degree in Physics & Computer Science, Bar–Ilan University, Israel – 2003–2007

Peer Reviewed Publications

* Contributed equally to this work; ★Advised student coauthor; ★Advised postdoc coauthor

Peer-Reviewed Journal Articles

1. ★O. Shishkov, **O. Peleg**
   Beyond social insects: Soft, dense, and active invertebrate aggregations
   Collective Intelligence *In Press* (2022) Preprint: https://arxiv.org/abs/2206.11129

2. ★R. Sarfati, L. Gaudette, J.M. Cicero, **O. Peleg**
   Statistical analysis reveals the onset of synchrony in sparse swarms of Photinus knulli fireflies
   Journal of the Royal Society Interface 19:188 (2022)

3. J. Peters, **O. Peleg**, L. Mahadevan
   Thermoregulatory morphodynamics of honeybee swarm clusters
   Journal of Experimental Biology 255(5): jeb242234 (2022)

4. ★R. Sarfati, ★J. Hayes, **O. Peleg**
   Self-organization in natural swarms of Photinus carolinus synchronous fireflies
   Science Advances 7 (28), eabg9259 (2021)

5. ★D.M. T. Nguyen, ★M. L. Iuzzolino, ★A. Mankel, K. Bozek, G. J. Stephens, **O. Peleg**
   Flow-mediated olfactory communication in honey bee swarms
   Proceedings of the National Academy of Sciences, USA 118 (13) e2011916118 (2021)

6. ★D.M. T. Nguyen, ★G.G. Fard, ★M. L. Iuzzolino, **O. Peleg**
   Robustness of collective scenting in the presence of physical obstacles
   Artificial Life and Robotics, doi.org/10.1007/s10015-021-00712-z (2021)

7. ★C. Nguyen, Y. Ozkan-Aydin, H. Tuazon, D. I. Goldman, S. Bhamla, **O. Peleg**
   Emergent collective locomotion in an active polymer model of entangled worm blobs
   Frontiers in Physics 9:540 (2021)

8. ★R. Sarfati, ★J. Hayes, E. Sarfati, **O. Peleg**
   Spatiotemporal reconstruction of emergent flash synchronization in firefly swarms via stereoscopic 360-degree cameras
   Journal of the Royal Society Interface 17:170 (2020)

9. ★G.K. Nave, ★N.T. Mitchell, ★J.A. Chan Dick, ★T. Schuessler, ★J.A. Lagarrigue, **O. Peleg**
   Attraction, dynamics, and phase transitions in fire ant tower-building
   Frontiers in Robotics and AI 7:25 (2020)

10. S. Bidari, **O. Peleg**, Z.P. Kilpatrick
    Social inhibition maintains adaptivity and consensus of foraging honeybee swarms in dynamic environments
    Journal of the Royal Society Open Science 6:12 (2019)

11. L. Khaldy, **O. Peleg**, C. Tocco, L. Mahadevan, M. Byrne, M. Dacke
    The effect of step size on straight-line orientation
    Journal of the Royal Society Interface 16: 20190181 (2019)

12. J. Peters, **O. Peleg**, L. Mahadevan
    Collective ventilation in honeybee nests
    Journal of the Royal Society Interface 16: 20180561 (2019)

13. **O. Peleg**
Mechanical hive mind
Physics Today 72(4), 66 (2019)

14. **O. Peleg**[*], J. Peters[*], M. Salcedo, L. Mahadevan
Collective mechanical adaptation of honeybee swarms
Nature Physics 14, 1193–1198 (2018)

15. **O. Peleg**, L. Mahadevan
Optimal switching between geocentric and egocentric strategies in navigation
Journal of the Royal Society Open Science 3, 160128 (2016)

16. L.S. Shagolsem, D. Osmanovic, **O. Peleg**, Y. Rabin
Pair interaction ordering in fluids with random interactions
The Journal of Chemical Physics 142, 051104 (2015)

17. **O. Peleg**, J.M. Choi, E. Shakhnovich
Evolution of specificity in protein-protein interactions
Biophysical Journal 107 (7), 1686-1696 (2014)

18. M.B. Harasim, B. Wunderlich, **O. Peleg**, M. Kröger, A.R. Bausch
Direct observation of the dynamics of semiflexible polymers in shear flow
Physical Review Letters 110, 108302 (2013)

19. M. Tagliazucchi[*], **O. Peleg**[*], M. Kröger, Y. Rabin, I. Szleifer
Effect of charge, hydrophobicity and sequence of nucleoporins on the translocation of model particles through the nuclear pore complex
Proceedings of the National Academy of Sciences, USA 110, 3363–3368 (2013)

20. **O. Peleg**, T. Savin, G. Kolmakov, I. Salib, M. Kröger, A.C. Balazs, V. Vogel
Fibers with integrated mechano-chemical switches: Minimalistic design principles derived from fibronectin
Biophysical Journal 103, 1909 (2012)

21. I. Salib, G. Kolmakov, B. Bucior, **O. Peleg**, T. Savin, M. Kröger, V. Vogel, K. Matyjaszewski, A.C. Balazs
Using mesoscopic models to design strong and tough biomimetic polymer networks
Langmuir 27, 13796–13805 (2011)

22. **O. Peleg**[*], M. Tagliazucchi[*], M. Kröger, Y. Rabin, I. Szleifer
Morphology control of hairy nanopores
American Chemical Society Nano (ACS Nano), 5(6), 4737, (2011)

23. **O. Peleg**, R.Y.H. Lim
Converging on the function of intrinsically disordered nucleoporins in the nuclear pore complex
Biological Chemistry 391, 719–730 (2010)

24. M. Kröger, **O. Peleg**, A. Halperin
From dendrimers to dendronized polymers and forests: Scaling theory and its limitations
Macromolecules 43, 6213–6224 (2010)

25. S. Fransson, **O. Peleg**, N. Loren, A.-M. Hermansson, M. Kröger
Modelling and confocal microscopy of biopolymer mixtures in confined geometries
Soft Matter 6, 2713–2722 (2010)

26. **O. Peleg**, M. Kröger, Y. Rabin
Effect of network topology on phase separation in two–dimensional Lennard–Jones networks
Physical Review E 79, 040401(R); also included in the Virtual Journal of Biological Physics 17:8 (2009)

27. **O. Peleg**, M. Kröger, Y. Rabin
Model of microphase separation in two-dimensional gels
Macromolecules 41, 3267–3275 (2008)

28. M. Kröger, **O. Peleg**, Y. Ding, Y. Rabin
Formation of double helical and filamentous structures in models of physical and chemical gels
Soft Matter 4, 18–28 (2008)

29. **O. Peleg**, M. Kröger, I. Hecht, Y. Rabin
Filamentous networks in phase-separating two-dimensional gels
Europhysics Letters 77, 58007 (2007)

Peer Reviewed Conference Papers (in Conference Proceedings)

1. ★C. Nguyen, ★I. Huang, **O. Peleg**
Firefly-inspired vocabulary generator for communication in multi-agent systems
The 2022 Conference on Artificial Life (ALIFE) (2022); 60.0% acc. rate.;

2. ★D.M. T. Nguyen, ★M. L. Iuzzolino, **O. Peleg**
Physical Obstacles Constrain Behavioral Parameter Space of Successful Localization in Honey Bee Swarms
The 2022 Conference on Artificial Life (ALIFE) (2022); 60.0% acc. rate.;

3. ★D.M. T. Nguyen, ★G.G. Fard, ★A. Atkins , ★P. Bontempo, ★M. L. Iuzzolino, **O. Peleg**
Honey Bees Find the Shortest Path: A Collective Flow-Mediated Approach
The 27th international symposium on artificial life and robotics (AROB); The 8th international symposium on biocomplexity (ISBC); The 5th international symposium on swarm behavior and bio-inspired robotics (SWARM) AROB-ISBC-SWARM2022 (2022); 92.3% acc. rate.;

4. ★D.M. T. Nguyen, ★G.G. Fard, ★M. L. Iuzzolino, **O. Peleg**
Robustness of collective scenting in the presence of physical obstacles
The 15th international symposium on distributed autonomous robotic systems (DARS); The 4th international symposium on swarm behavior and bio-inspired robotics (SWARM)
DARS-SWARM2021 (2021);

5. ★G.G. Fard, E. Bradley, **O. Peleg**
Data-driven modeling of resource distribution in honeybee swarms
The 2020 Conference on Artificial Life (ALIFE) (2020); 60.1% acc. rate.;

Peer Reviewed Extended Abstracts (not in Conference Proceedings)

1. ★C. Nguyen, ★I. Huang, **O. Peleg**
Firefly-inspired vocabulary generator for communication in multi-agent systems
The 15th international symposium on distributed autonomous robotic systems (DARS); The 4t international symposium on swarm behavior and bio-inspired robotics (SWARM); (DARS-SWARM2021) (2021).

2. ★G.G. Fard, E. Bradley, **O. Peleg**
   Data-driven modeling of resource distribution in honeybee swarms
   Collective Intelligence (CI) (2020).

3. ★G.G. Fard, E. Bradley, O. Peleg
   An Integrated Experimental-modeling Approach to Resource Sharing in Honeybee Swarms
   Robotic-inspired Biology workshop at the International Conference on Intelligent Robots and Systems (IROS) (2020).

4. ★D.M. T. Nguyen, ★M. L. Iuzzolino, ★A. Mankel, K. Bozek, G. J. Stephens, **O. Peleg**
   Flow-mediated olfactory communication in honey bee swarms
   Robotic-inspired Biology workshop at the International Conference on Intelligent Robots and Systems (IROS) (2020).

5. ★C. Nguyen, ★I. Huang, **O. Peleg**
   Firefly-inspired vocabulary generator for communication in multi-agent systems
   Robotic-inspired Biology workshop at the International Conference on Intelligent Robots and Systems (IROS) (2020).

Papers In Preparation / Under Peer Review

1. ★G. Gharooni Fard, ★Daisy Zhang, Francisco López Jiménez, **O. Peleg**
   Honeycomb crystallography: Experiment-theory approach for bee comb formation under geometric frustrations
   In revisions at *PNAS* (2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.03.13.484106v2

2. ★D.M. T. Nguyen, ★G.G. Fard, ★A. Atkins , ★P. Bontempo, ★M. L. Iuzzolino, **O. Peleg**
   Honey Bees Find the Shortest Path: A Collective Flow-Mediated Approach
   Accept (as full paper with revision) at *AROB* (2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.06.27.497822v1

3. ★R. Sarfati, K. Joshi, ★O. Martin, ★J.C. Hayes, S. Iyer-Biswas, **O. Peleg**
   Emergent periodicity in the collective synchronous flashing of fireflies
   In revisions at *eLife* (2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.03.09.483608v1

4. ★O. Shishkov, ★C. Chen, ★C.A. Madonna, Kaushik Jayaram, **O. Peleg**
   Strength-mass scaling law governs mass distribution inside honey bee swarms
   Under review at *Scientific Reports* (2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.03.11.484032v1

5. ★R. Sarfati, **O. Peleg**
   Chimera states among synchronous fireflies
   Under review at *Sci Adv* (2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.05.12.491720v1

6. ★R. Sarfati, **O. Peleg**
   Calibration-free 3D reconstruction of firefly trajectories from 360-degree cameras
   In preparation (2022) Preprint: https://www.biorxiv.org/content/10.1101/2021.04.07.438867v1

7. ★C. Nguyen, I. Dromi, A. Kempinski, G.E.C. Gall, **O. Peleg**, Y. Meroz
   Noise-mediated self-organization in mutually shading sunflowers
   In preparation(2022) Preprint: https://www.biorxiv.org/content/10.1101/2022.06.11.495747v1

8. C. Kempes, **O. Peleg**
On the hidden physics of social aggregations, In preparation (2022)

Conference and Seminar Talks

[P] Plenary **[I]** Invited **[C]** Contributed; *Only listing talks delivered by Peleg*

1. **[I]** Title: TBD. American Physical Society (APS) March Meeting Focus session on "Pattern Formation in Biological Systems" (2023)
2. **[I]** Title: Emergent Spatiotemporal Patterns in Insect Swarms. Gordon Research Conference Stochastic Physics in Biology: Bridging Experiments and Theories (2023)
3. **[I]** Title: Firefly Communications: Principles and Predictions. Joint Mathematics Meetings, Special Session "Modeling collective behavior in biology" (2023)
4. **[I]** Physical Computation in Insect Swarms. Computations in Science Seminars, University of Chicago, IL, USA (2022)
5. **[I]** Title: The Physics of Honey Bee Swarms. UC Berkeley Essig Brunch seminar, CA, USA (2022)
6. **[I]** Title: TBD. Center for Theoretical Biophysics Seminar. Rice University (2022)
7. [P] Title: Physical Computation in Insect Swarms. NetSci 2022 satellite "Multiscale & Integrative compleX Networks: EXperiments & Theories" (2022)
8. **[I]** Title: The mechanics of honey bee swarms: aggregation, steady-states, and adaptation. International Union for the Study of Social Insects (IUSSI) Annual Meeting, Symposium on Advances in Collective Behavior (2022)
9. **[I]** Titles : (1)Collective ecophysiology in bee swarms, (2)The physics of firefly communication. 2022 Complex Systems Summer School, Santa Fe Institute (2022)
10. **[I]** Physical Computation in Insect Swarms. Seminar, Santa Fe Institute (2022)
11. **[C]** Title: Three-dimensional tracking: Insights into firefly behavior and conservation. Computations in Science Seminars, The International Firefly Symposium 2022 (IFS2022), Lisbon, Portugal (2022)
12. **[I]** Title: Visual communication in dense firefly swarms. Computer Vision and Pattern Recognition Conference (CVPR) 2022, workshop on "Multi-Agent Behavior Modeling"(2022)
13. **[I]** Title: Physical Computation in Insect Swarms. University of British Columbia, Math-Biology Seminar Series (2022)
14. **[I]** Title: The Physics of Firefly Communications: Principles and Predictions. Quantitative Ecology/Ethology/Evolution Discussions (QED) Harvard University (2022)
15. **[I]** Title: Physical Computation in Insect Swarms. Department of Engineering Sciences and Applied Mathematics, Northwestern University, Theoretical Physics of Biological Systems Seminar Series (2022)
16. **[I]** Title: The Physics of Firefly Communications: Principles and Predictions. Santa Fe Institute, workshop on "Constructing and Deconstructing Collectives: Signals to Space to Society"(2022)
17. **[I]** Title: Physical Computation in Insect Swarms. Institute for Pure and Applied Mathematics (IPAM) at UCLA, workshop on "Mathematics of Intelligences"(2022)
18. **[I]** Title: Physical Computation in Insect Swarms. Clore Seminar on Soft and Biological Physics, Weizmann Institute of Science, Israel (2021)
19. **[I]** Title: Physical Computation in Insect Swarms. Department Colloquium, Applied Mathematics Department, CU Boulder (2021)

20. **[I]** Title: Physical Computation in Insect Swarms. Condensed Living Matter Seminar, Physics Department, University of Pennsylvania (2021)

21. **[I]** Title: Physical Computation in Insect Swarms. Physics of Behavior Symposium, CUNY/Princeton Initiative for the Theoretical Sciences (2021)

22. **[I]** Title: Physical Computation in Insect Swarms. Department Colloquium, Physics Department, CU Boulder (2021)

23. **[I]** Title: Collective Ecophysiology and Physics of Honey Bee Swarms. Ernst Strüngmann Institute at Max Planck Society (Frankfurt, Geremany), Systems Neuroscience Conference (ESI SyNC) (2021)

24. **[I]** Title: Physical Computation in Insect Swarms. University College London, Symposium on Smartish: How Dumb Agents Act Clever Together (2021)

25. **[I]** Title: Physical Computation in Insect Swarms. Department Colloquium, Computer Science Department, CU Boulder (2021)

26. **[I]** Title: Collective Ecophysiology and Physics of Honey Bee Swarms. University of Cambridge, Theory of Living Matter Seminar (2021)

27. **[I]** Title: The Physics of Firefly Communications: Principles and Predictions. American Physical Society (APS) March Meeting Symposium on Living timekeepers: Precision measurements, emergent simplicities and physics theory (2021)

28. **[I]** Title: Collective Ecophysiology and Physics in Bee Swarms . Institute of Integrative Biology (D-USYS) at ETH Zurich (2021)

29. **[I]** Title: Spatio-temporal Reconstruction of Emergent Flash Synchronization in Firefly Wwarms. The Bell Edwards Geographic Data Institute Seminar. School of Geography and Sustainable Development, University of St Andrews in Scotland (2021)

30. **[I]** Title: On Growth and Form of Dense Insect Aggregations. South American Institute for Fundamental Research (ICTP-SAIFR) Complex Systems Seminar. Institute of Theoretical Physics of São Paulo State University, Brazil (2021)

31. **[I]** Title: Collective Ecophysiology and Physics of Honeybees. Virtual Systems Neuroecology Seminar Series (2021)

32. **[P]** Collective Ecophysiology and Physics of Honeybees. IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS) (2020)

33. **[I]** Insect Aggregations. Online Course "Complexity Interactive", Santa Fe Institute (2020)

34. **[I]** Mechanical Hive Mind. Centre for the Advanced Study of Collective Behaviour (CASCB) at the University of Konstanz (2020)

35. **[I]** Flow-Mediated Olfactory Communication in Honey Bee Swarms. Virtual American Mathematical Society (AMS) MS Fall Southeastern Sectional Meeting (2020)

36. **[I]** On Growth and Form of Dense Insect Aggregations. Theory and Modeling of Living Systems Workshop on (What) can soft matter physics teach us about biological function? Emory University (2020)

37. **[I]** Mechanical Hive Mind. Virtual Biological Physics/Physical Biology (BPPB) Seminar (2020)

38. **[P]** Collective Ecophysiology and Physics of Honeybees. The 10th International Conference on Complex Systems (2020)

39. **[C]** Data-driven Modeling of Resource Distribution in Honeybee Swarms. The 2020 Conference on Artificial Life (ALIFE) (2020)

40. **[C]** Data-driven Modeling of Resource Distribution in Honeybee Swarms. Association for Computing Machinery (ACM)Collective Intelligence 2020 (2020)

41. **[I]** Collective Aggregation via Directed Pheromone Signaling in Honeybee Swarms. Society for Industrial and Applied Mathematics (SIAM) Conference on the Life Sciences (2020)

42. **[C]** Collective Aggregation via Directed Pheromone Signaling in Honeybee Swarms. American Physical Society (APS) March Meeting (2020)

43. **[I]** Collective Ecophysiology and Physics of Honeybees. Nonlinear Science & Mathematical Physics Seminar Series, Georgia Institute of Technology, GA, USA (2020)

44. **[I]** Collective Ecophysiology and Physics of Honeybees. Physics Colloquium, Emory University, GA, USA (2020)

45. **[I]** Collective Ecophysiology and Physics of Honeybees. Institute of Cognitive Science Colloquium, University of Colorado Boulder, CO, USA (2020)

46. **[I]** Collective Ecophysiology and Physics of Honeybees. Ecology and Evolutionary Biology Seminar, Princeton University, NJ, USA (2019)

47. **[C]** Collective Mechanical Adaptation of Honeybee Swarms. Society for Industrial and Applied Mathematics (SIAM) Conference on Dynamical Systems (2019)

48. **[I]** Physics of Social Insects. Computations in Science Seminars, University of Chicago, IL, USA (2019)

49. **[I]** Physics of Social Insects. Center for Nonlinear Studies Colloquia, Los Alamos National Laboratory, NM, USA (2019)

50. **[C]** Collective Physical Computation in Honeybee Swarms. Workshop on What is Biological Computation?, Santa Fe Institute (SFI), USA (2019)

51. **[I]** Collective Mechanical Adaptation of Honeybee Swarms. American Physical Society (APS) March Meeting (2019)

52. **[I]** Physics of Social Insects. The Boulder School in Condensed Matter and Materials Physics, CO, USA (2019)

53. **[I]** Collective Adaptation in Honeybee Swarms. Bio-mechanics workshop on Cell membrane dynamics and micro-circulation in tissue, University of Oslo, Norway (2018)

54. **[I]** The Physics of Disordered Living Systems: Collective Adaptation in Honeybee Swarms. PIER Graduate Week, University of Hamburg, Germany (2018)

55. **[I]** Intrinsically Disordered Living Systems. Santa Fe Institute Seminar, NM, USA (2018)

56. **[I]** Collective Ecophysiology and Physics of Honeybees. Active Matter Workshop, University of Colorado Boulder CO, USA (2018)

57. **[I]** Collective Ecophysiology and Physics of Honeybees. Society for Industrial and Applied Mathematics (SIAM) Conference on the Life Sciences (2018)

58. **[I]** Collective Mechanical Adaptation of Honeybee Swarms. Robinson Lab Seminar, University of Illinois, Urbana Champaign, IL, USA (2018)

59. **[I]** Local Sensing in Disordered Living Systems. Janelia/MSRI Summer Graduate School on Mathematical Analysis of Behavior VA, USA (2018)

60. **[C]** Collective Mechanical Adaptation of Honeybee Swarms. Dynamics Days, CO, USA (2018)

61. **[I]** Honeybee Collective Behavior. Summer Program of the Aspen Center for Physics (ACP), CO, USA (2018)

62. **[I]** Collective Ecophysiology and Physics of Social Insects. Quantitative Biology (QBio) Seminar, University of California San Diego, CA, USA (2018)

63. **[I]** Collective Mechanical Adaptation of Honeybee Swarms. Bioinformatics Supergroup Seminar, University of Colorado Boulder, CO, USA (2018)

64. **[C]** Collective Mechanical Adaptation of Honeybee Swarms. Distributed, Collective Computation in Biological and Artificial Systems Meeting, Janelia Research Campus, VA, USA (2018)

65. **[I]** Collective Mechanical Adaptation of Honeybee Swarms. 2nd Week on Complexity Sciences at C3-UNAM, Mexico City, Mexico (2018)

66. **[I]** Local Sensing in Disordered Living Systems. Biophysics Seminar Series, Princeton University, NJ, USA (2017)

67. **[I]** Local Sensing in Disordered Living Systems. Mechanical Engineering Special Seminar, MIT, MA, USA (2017)

68. **[I]** Local Sensing in Disordered Living Systems. Complex Systems Seminar, University of Michigan, MI, USA (2017)

69. **[I]** Local Sensing in Disordered Living Systems. BioFrontiers Symposium and Computer Science Colloquium, University of Colorado Boulder, CO, USA (2017)

70. **[C]** Mechanical Adaptation in Adhesive Bee Swarms. American Physical Society (APS) March Meeting, LA, USA (2017)

71. **[C]** How a Bee Swarm Adapts to Dynamic Mechanical Stress. Society for Integrative and Comparative Biology (SICB) Annual Meeting, LA, USA (2017)

72. **[C]** Optimal Switching between Geocentric and Egocentric Strategies in Navigation. Insect Navigation Workshop, Janelia Research Campus, VA, USA (2016)

73. **[C]** Ecophysiology of Honeybee Swarms. 18th Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University MA, USA (2016)

74. **[C]** Dynamic Morphology in Honeybee Swarms. Annual Meeting of the International Physics of Living Systems (iPoLS) Network, Harvard University MA, USA (2016)

75. **[C]** Dynamic Morphology in Honeybee Swarms. Workshop on Active and Smart Matter: A New Frontier for Science and Engineering, Syracuse University, NY, USA (2016)

76. **[C]** Dynamic Morphology in Honeybee Swarms. Workshop on Social Insects In the North East Regions, Pennsylvania State University, PA, USA (2016)

77. **[I]** Systems Biophysics of Protein–Protein Interactions. Green Center for Systems Biology, Texas University Southwestern Medical Center TX, USA (2015)

78. **[C]** Optimal Intermittent Reorientation in Insect Navigation. Gordon Research Conference on Stochastic Physics in Biology, CA, USA (2015)

79. **[C]** Evolution of Specificity in Protein-Protein Interactions. 16th Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University, MA, USA (2015)

Teaching Experience

Quantitative Approaches to Behavior, Champalimaud Centre for the Unknown (CAJAL) Portugal; Summer 2022

CSCI–5/4314, Dynamic Models in Biology, University of Colorado at Boulder; Springs 2019-2023

CSCI–5423, Bio–inspired Multi–agent Systems, University of Colorado at Boulder; Springs 2018-2023

Bio-Math REU Program, The University of North Carolina at Greensboro; Summer 2019

Summer Graduate School on Mathematical Analysis of Behavior, Janelia Research Campus/MSRI; Summer 2018

CSE Capstone Project Course, Harvard University; Spring 2016

Inverse Problems in Science and Engineering, Harvard University; Spring 2016

2014 Brains, Minds and Machines Summer Course, The Marine Biological Laboratory; Summer 2014

Laboratory Course in Simulation Methods, Department of Materials, ETH Zürich; Fall 2009, 2011

Computational Polymer Physics, ETH Zürich; Springs 2008-2010

Programming and Simulation Techniques in Materials Science, ETH Zürich; Spring 2008

Computational Physics, Bar–Ilan University; Winter 2007, Numerical Analysis, Bar–Ilan University; Winter 2006

Mentoring Activities

Postdoctoral Researchers

2020–Present Dr. Olga Shishkov, Project: Spatiotemporal Integration and Propagation of Mechanical Signals in Honeybee Swarms: 3D structure reconstruction via x–ray

2019–Present Dr. Raphael Sarfati, Project: Physics and Information Theory of Firefly Communication

2019–Present Dr. Chantal Nguyen, Project: Trade–offs in Rapid Plant Movement

2018–2020 Dr. Gary K. Nave, Project: Self–organized mechanical load bearing in bee and ant swarms

Ph.D Students

August 2022 - Nolan Bonnie, IQ Biology PhD Program, and the Computer Science PhD Program, CU Boulder Project: TBD

August 2022 - Narcís Font, co–advised with Prof. Serena Ding, Max Planck Institute of Animal Behavior Project: TBD

2020–Present Owen Martin, Computer Science PhD Program, CU Boulder. Project: Physics and Information Theory of Firefly Communication

2018–Present Golnar G. Fard, co–advised with Prof. Elizabeth Bradley, Computer Science PhD Program, CU Boulder. Project: Efficiency of Food Distribution via Trophallaxis in Honeybees

2018–2022 Dieu My Nguyen, IQ Biology PhD Program, and the Computer Science PhD Program, CU Boulder Project: Adaptive Pheromone Communication Networks in Honeybees

Graduate Rotations and Short Term Projects

2021 Fall Ryan Senne, Rotation IQ Biology PhD Program at CU Boulder

2021 Fall Aubry Kroger, Independent Study EE MS Program at CU Boulder

2020-2021 Sanskar Katiyar, Independent Study CS MS Program at CU Boulder

2020 Fall Claire Powers, Rotation IQ Biology PhD Program at CU Boulder

2020 Summer Katherine Gruenewald, Research Assistant, CU Boulder

2020 Spring Ellen Marie Waddle, Liam Friar, Tristan Caro, Jack Gugel, Team-Science Project, Co-supervised with Prof. Dan Doak, IQ Biology PhD Program at CU Boulder

2020 Spring Isabella Huang, Independent Study CS MS Program at CU Boulder

2019 Fall Ellen Marie Waddle, Rotation IQ Biology PhD Program at CU Boulder

2019 Fall Aaron Mankel, Independent Study CS MS Program at CU Boulder

2019 Fall Rajarshi Basak, Independent Study CS MS Program at CU Boulder

2019 Spring Chan Lee, Independent Study MS Program at CU Boulder

2018 Fall Kathleen Murphy, Rotation IQ Biology PhD Program at CU Boulder

2018 Fall Sierra Jech, Rotation IQ Biology PhD Program at CU Boulder

2018 Fall Dieu My Nguyen, Independent Study CS PhD Program at CU Boulder

2018 Fall Timothy Thorn, Rotation IQ Biology PhD Program at CU Boulder

2018 Lisa Natale, EBio PhD Program at CU Boulder

2018 Summer Nina Ning, Feng Ling, and Samantha Hill, Janelia/MSRI Summer Graduate School on Mathematical Analysis of Behavior

2018 Spring Scott Nordstrom, Rotation IQ Biology PhD Program at CU Boulder

2018 Spring Grant Vogel, Rotation IQ Biology PhD Program at CU Boulder

2018 Fall Ashwin Sankaralingam, Independent Study MS Program at CU Boulder

2018 Spring Shayon Gupta, Independent Study MS Program at CU Boulder

Post-Bachelor Students

2021-2022 Erica Maul, Post-Bachelor Research Assistant

2018-2020 Julie Hayes, Post-Bachelor Program in Computer Science at CU Boulder

Undergraduate Students

2022 Summer Maridith Stading, , Summer Program for Undergraduate Research (SPUR), CU Boulder

2022 Summer Allison Dickie, Bachelor of Arts - BA, Pre-Medicine/Pre-Medical Studies, CU Boulder

2022 Summer Carrisa Mayo, Bachelor of Statistics & Data Science and Computer Science, CU Boulder

2021–2022 Skylar Gale, Discovery Learning Apprenticeship (DLA) program and Undergraduate Research Opportunities Program (UROP) program, CU Boulder

2021-2022 Claire Madonna, Chemical and Biological Engineering, Biological Sciences Initiative (BSI) Scholars Program, CU Boulder

2021 Summer Alexander Lawson, Mechanical Engineering, CU Boulder

2021 Summer Claire Madonna, Chemical and Biological Engineering, Summer Program for Undergraduate Research (SPUR), CU Boulder

2021 Summer Patricia Mendoza-Anselmi, Chemical and Biological Engineering, CU Boulder

2021 Summer Ashley Atkins, Mechanical Engineering, CU Boulder

2021 Summer Paul Bontempo, Aerospace Engineering, CU Boulder

2020–2021 Claudia Chen, Discovery Learning Apprenticeship (DLA) program and Undergraduate Research Opportunities Program (UROP) program, CU Boulder

2019–2020 Aubrey Kroger, Discovery Learning Apprenticeship (DLA) program, CU Boulder

2018-2019 Christopher Mulligan, Undergraduate Research Opportunities Program (UROP) program, co-advised with Dr. Ed Chuong, CU Boulder

2019 Summer Hadley Bell Tallackson, Chemical and Biological Engineering, Summer Program for Undergraduate Research (SPUR), CU Boulder

2019 Summer Spencer Moore, Matthew Miller, Maya Brody, REU program at UNC Greensboro, USA

2018-2020 Aaron Mankel, Bachelor of Science in Physics Program at CU Boulder

2018-2019 Brianna Boeyink, Discovery Learning Apprenticeship (DLA) Program at CU Boulder

2018-2019 Huy Tran, Bachelor Program in Chemical and Biological Engineering at CU Boulder

2018 Summer Chloe Bruce, Summer Program for Undergraduate Research at University of Colorado Boulder

2017 Dominic Bosco, Ethan Hobbs, Rebecca Wayne, James Worsham, Harvard Paulson School of Engineering and Applied Sciences TRiCAM research program

2015-2016 Aditya Raguram, Harvard Paulson School of Engineering and Applied Sciences REU program

High-school Students

2022 Summer Ricky Yang and Olaya Garcia-Grau, the Summer 2022 STEM Research Experience, CU Boulder

2020-2022 Daisy Zhang, ATHENA By WiSTEM Summer Program

2018-2021 Charlotte Gorgemans, Boulder High School

2019 Summer Jackson Bremen, April Tong, Sloan Woodberry, CU Science Discovery program, CU Boulder

2018-2019 William (Jake) Hofgard, Boulder High School

Graduate Thesis Committees

2022–Present Ameya G. Prabhune , PhD Program, Physics, CU Boulder

2022–Present Elise Tate, PhD Program, IQBio/Computer Science, CU Boulder

2022–Present Tzu-Chi Yen , PhD Program, Computer Science, CU Boulder

2021–Present Elias Stallardolivera, PhD Program, Environmental and Evolutionary Biology, CU Boulder

2020–Present Justin Trupiano, PhD Program, Emergent Technologies and Media Arts Practices, CU Boulder

2020–Present Ellen Waddle, PhD Program, IQBio/Environmental and Evolutionary Biology, CU Boulder

2021 Ethan Hobbs, MSc Program, Computer Science, CU Boulder

2021–2022 Michael Iuzzolino, PhD Program, Computer Science, CU Boulder

2020–2022 Lyndsey Wong, PhD Program, IQBio/Applied Math, CU Boulder

2019–2021 Haichao Wu, PhD Program, Chemical Engineering, CU Boulder

2019–2021 Connor Thompson, PhD Program, Chemical Engineering, CU Boulder

2019–2022 Katherine Hernandez, PhD Program, Environmental and Evolutionary Biology, CU Boulder

2018–2020 Erin Connor, PhD Program, Civil, Environmental and Architectural Engineering, CU Boulder

2018–2020 Ignacio Tripodi, PhD Program, IQBio/Computer Science, CU Boulder

2018–2021 Abhijit Suresh, PhD Program, Computer Science, CU Boulder

Undergraduate Thesis Committees

2022–present Saurabh Totey, Senior Undergraduate Thesis, BS in Computer Science, CU Boulder

2020–2021 Skylar Martin, Senior Undergraduate Thesis, BS in Computer Science, Computational Biology Minor, CU Boulder

2018 Tyler Schuessler, Honors Thesis, BS in Applied Math, CU Boulder

Funding

Research Grants

2022–2025 Research Cooperation for Science Advancement (RCSA), Cottrell Scholar Award
100K USD, Physics of Firefly Communication, grant #28219

2022–2025 National Science Foundation (NSF), Physics of Living Systems Program
499K USD (my portion: **270K USD**), Bee-honeycomb Formation under Geometric Frustration (with PI F. L. Jimenez), grant #2210628

2021–2022 National Geographic Society (NGS), AI for Earth Innovation
150K USD, High-throughput Automatic Monitoring Tools for Firefly Conservation, grant # NGS-84850T-21 (including 50K USD cloud computing credit from Microsoft)

2021–2022 Army Research Office (ARO), Mechanical Sciences Division
100K USD, Spatiotemporal Integration and Memory of Mechanical Signals in Sensitive Plants, grant # 78234-EG

2020–2023 National Science Foundation (NSF), Physics of Living Systems Program
449K USD, Collective Olfactory Communication in Honeybee Swarms, grant #2014212

2020–2022 CU Boulder, Research and Innovation (RIO), Seed Grant
44K USD (my portion: **22K USD**), Bee-honeycomb Formation under Geometric Frustration (with Co-PI F. L. Jimenez)

2019–2022 Human Frontiers Science Program (HFSP), Young Investigator Grant
1.1M USD (my portion: **350K USD**), The Dynamics of Information Flow in a Social Network of Mutually Shading Plants (lead PI, with Co PIs Y. Meroz and A. Jordan), grant #RGY0078/2019

2012-2013 Swiss National Science Foundation (SNSF), Fellowship for Prospective Researcher
44K CHF **(~44K USD),** Evolutionary Design of Intrinsically Disordered Proteins, grant # PBEZP3 140130 4

Smaller Grants

2021 CU Boulder, Autonomous Systems IRT, 15K USD, Autonomous Synchronization in Firefly Swarms

2021 CU Boulder, Multi-functional Materials IRT, 4.5K USD, Biologically-Inspired Self-Organizing Micro-Robotic Swarms (with PI K. Jayaram)

2020–2021 Google Cloud Platform (GCP) research credits program, 5K USD, Dense Object Tracking in a 2D Honeybee Hive, grant number RRDB-ALJJ-4Y0J-NEMR

2018 CU Boulder, Multi-functional Materials IRT, 10K USD, Self-Organized Mechanical Load Bearing in Bee Swarms: 3D Structure Reconstruction via X–ray

2018 CU Boulder, Autonomous Systems IRT, 5K USD, Autonomous Distributed Computation in Honeybee Swarms

2016 Participant Travel Grant Insect Navigation Workshop, Janelia Research Campus

2016 Junior Scientist Travel Grant Active and Smart Matter, Syracuse University

2015 Contributed Lecture Travel Grant Gordon Research Conference on Stochastic Physics in Biology

Awards and Honors

2022 Cottrell Scholar Award of the Research Cooperation for Science Advancement

2021 Junior Scientific Award of the Complex Systems Society *"for her contributions to the understanding of collective dynamics"*

2021 Paper on firefly synchronization chosen to appear on the cover of Science Advances

2021 Selected as Research & Innovation Office Faculty Fellow at CU Boulder

2021 Selected as National Geographic Explorer

2020 Paper on firefly synchronization chosen to appear on the cover of Journal of Royal Society Interface

2019 Appointed as External Professor at Santa-Fe Institute

2019 Elected for Member–at–Large at the Executive Committee of the Division of Biological Physics, American Physical Society

2016 Selected to participate at the Rising Stars in Physics workshop, MIT. This workshop brings the next generation of physics academic leaders together https://physicsrisingstars.mit.edu/

2015 Chosen for a Junior Scientist Lecture at the Gordon Conference on Stochastic Physics in Biology

2014 "Evolution of Specificity in Protein-Protein Interactions" paper chosen to appear on the cover of Biophysical Journal and chosen among Biophysical Journal Best of 2014

Service

Journal Peer Review

Nature, eLife, Scientific Reports, Chemical Physics Letters, Polymers, Proceedings of the Royal Society B, Journal of the Royal Society, Interface, Distributed Autonomous Robotic Systems, Physical Biology, Science Advances, Robotics and Autonomous Systems, Animal Behaviour, PLOS Computational Biology, Swarm Intelligence, Nature Ecology and Evolution, Current Biology, Ecological Psychology, Collective Intelligence, Nature Communications Physics, Physical Review Fluids, PNAS.

Grants and Fellowships Peer Review

2022 National Science Foundation (NSF), Engineering panel
https://www.nsf.gov/div/index.jsp?org=CMMI

2021 Templeton World Charity Foundation, External Reviewer
https://www.templetonworldcharity.org/

2021 National Science Foundation (NSF), Graduate Research Fellowship Program Panel
https://www.nsfgrfp.org/

2021 National Science Foundation (NSF), Physics Panel
https://www.nsf.gov/mps/phy/about.jsp

2019-2021 Complexity Postdoctoral Fellows, Santa Fe Institute
http://www.santafe.edu/sfifellowship

2021-2022 RIO Seed Grant, University of Colorado Boulder

2021 Natural Sciences and Engineering Research Council of Canada (NSERC)
https://www.nserc-crsng.gc.ca/Professors-Professeurs/index_eng.asp

2020 AB Nexus Seed Grant, University of Colorado Boulder
https://www.colorado.edu/researchinnovation/2020/08/06/ab-nexus

2019 American Chemical Society (ACS) Petroleum Research Fund (PRF) www.acs.org/content/acs/en/funding-and-awards/grants

Editorial

2021 Guest Associate Editor, *PLOS Computational Biology*

2020-2021 Guest Associate Editor, the journal of *Frontiers in Physics*, special topic: "Physics of Social Interactions" https://www.frontiersin.org/research-topics/16040/physics-of-social-interactions

Scientific Meetings

2022 Member, Program Committee of ANTS 2022 - 13th International Conference on Swarm Intelligence

2022 Member, Collective Intelligence 2022 Conference, Program Committee

2022 Member, Program Committee of the international symposium on distributed autonomous robotic systems 2022 — DARS 2022

2022 Co-Director, Cajal Course-Quantitative Approaches to Behavior, Lisbon Portugal (with B. de Bivort, G. Berman, G. de Polavieja and G. Stephens)

2022 Co-Organizer and Chair of Physics of Social Interactions Focus Session at APS (American Physical Society) March Meeting 2021, (with G. Stephens)

2022 Co-Organizer, Aspen Winter Conference at Aspen Center of Physics on Physics of Social Interactions, CO USA (with J. Shaevitz and G. Stephens)

2021 Member, Program Committee of the joint 15th international symposium on distributed autonomous robotic systems 2021 and the 4th international symposium on swarm behavior and bio-inspired robotics 2021 (DARS/SWARM2021)

2021 Co-Organizer and Chair of Physics of Social Interactions Focus Session at APS (American Physical Society) March Meeting 2021, (with G. Stephens)

2020-2023 Co-Organizer and co-Founder of Living Histories Lecture Series DBIO (division of Biology) APS (American Physical Society), with S. Iyer-Biswas
youtube.com/channel/UCBuZ6okBbRvosC0S67WI2gg
iyerbiswas.com/outreach/livinghistories/

2020 Member, Collective Intelligence 2020 Conference, Program Committee

2020 Co-Organizer and Chair of Physics of Social Interactions Focus Session at APS (American Physical Society) March Meeting 2020, (with G. Stephens)

2019 Co-Organizer of Physics of Mechanics of growth, morphogenesis and evolution of biological solids Symposium at Society for Engineering Science (SES) 2019 meeting, Washington University

2019 Chair of CP31 Collective Behavior Session at SIAM Conference on Dynamical Systems, Snowbird, UT, USA

2017 Co-Chair of Neuromechanics II session at Society for Integrative and Comparative Biology (SICB) Annual Meeting, New Orleans, LA, USA

Panels

2020 Panelist on the Interdisciplinary Research Panel at the Virtual American Mathematical Society South East (AMS SE) Sectional Meeting.

Professional Societies

2022-2024 Member, APS DBIO Fellowship Committee

2022-2023 Member, the Complex Systems Society (CSS) Senior, Junior, and Emerging Researcher Awards Committee

2020, 2022-23 Member–at–Large at the Executive Committee of the Division of Biological Physics (DBIO), American Physical Society (APS)

2022-2023 Chair, APS DBIO Thesis Award Committee

2020-2022 Secretary and Treasurer (S/T), Executive Committee of the Division of Biological Physics (DBIO), American Physical Society (APS)

2020-2021 Member, APS DBIO Thesis Award Committee

2020-2021 Member, APS DBIO Program Committee

University Service

2022-Present Member, CS DEI Committee

2019-Present Member, BioFrontiers undergrad curriculum committee, Computational Biology minor program

2019-Present Member, BioFrontiers National Science Foundation Research Traineeship (NSF-NRT) grant committee

2019-Present Member, BioFrontiers National Institutes of Health Institutional Research Training Grant (NIH-T32) grant committee

2019-Present Member, BioFrontiers National Science Foundation Research Traineeship grant for Sustained Availability of Biological Infrastructure (NSF-SABI) Core Program

2019–Present Member, Computational Biology Minor Advisory Committee (Computer Science and BioFrontiers)

2019-Present Member, Advisory Committee for CMAP (the Center for Media Arts and Performance) in ATLAS

2018–Present Member, BioFrontiers Institute Council (formerly Task Force)

2021-Present Member, BioFrontiers IQ Biology and NSF-NRT Admission Committee

2022 Gave a research lecture to the CS Computing Advisory Board members

2021 Participated at a BioFrontiers event with potential donors

2018, 2021-22 Gave a research talk for incoming IQ Bio students at the Summer Orientation Event

2019, 2021 Led an Idea-Exchange gathering with IQ Biology students

2019, 2021 Science Short Talk, BioFrontiers Council Meeting

2021 CU Boulder RIO Seed Grant reviewer, University of Colorado Boulder

2020 AB Nexus Seed Grant reviewer, University of Colorado Boulder

2020 Gave a public talk about honeybees and dung beetle research at Engineering Exploration Lecture Series, Boulder CO, USA https://www.colorado.edu/ewb/exploration

2018-2019 Organized two events for students and faculty associated with Complex Systems at the Computer Science Department (including short research presentations and happy-hour)

2018–2019 Member, Engineering College Materials Science faculty search

2018 Member, BioFrontiers Institute Search Committee for Scientific Web Developer (BioFrontiers Institute Information Technology)

2017 Organized an online recruiting event for the IQ Biology program

Professional Development

2022	Research & Innovation Office Faculty Fellow Program at CU Boulder (research and creative works leadership program that supports rising CU Boulder faculty)
2022	Selected to participate in a National Science Foundation (NSF) workshop on Understanding the Rules of Life: Achieving a Sustainable Future
2020, 2022	"Teaching Circles" CU Boulder, CS Department colleague teaching evaluation program
2018	Participated in the Computing Community Consortium (CCC) Workshop on Robotic Materials
2017	CS New Faculty Teaching Workshop with focus on evidence-based instructional practices, at University of California San Diego
2016	Mini-MBA (Master of Business) Course at Harvard Business School (a five-week accelerated business course)

Outreach

2022	Featured in a SciGirls TV episode (PBS) on our work with synchronous fireflies in Congaree National Park, SC, USA
2022	Invited to give a public talk about honeybee research to beekeepers at Northern Colorado Beekeeper's Association, Loveland CO, USA
2021	Wrote a popular science article for Aeon Magazine titled "Living orbs of light" (Solving the mystery of how and why fireflies flash in time can illuminate the physics of complex systems) https://aeon.co/essays/what-secrets-do-the-synchronised-flashes-of-fireflies-unlock
2021	Invited to give a talk titled "Computing the Swarm: How the dynamics of fireflies, bees, and sheep may lead to robots that work en masse" to journalists at ScienceWriters2021 - a joint annual meeting of the National Association of Science Writers and the Council for the Advancement of Science Writing
2021	Featured as a Comic Strip character at Science News for Students on "How bees play telephone to form a swarm" https://www.sciencenewsforstudents.org/article/bees-play-telephone-swarm-pheromones-comic
2021	Two local high school students, Charlotte Gorgemans and April Tong, have been volunteering in the Peleg Lab. The students' work has led them to submit projects to several science fairs to great success: https://www.colorado.edu/cs/2021/07/08/it-takes-hive-community-volunteers-honeybee-research
2021	Interview with Peleg, to appear in a children's book called *Fireflies and Glowworms,* in a series called "Lights on! Animals That Glow". Publisher: Rourke Educational Media
2021	Invited to give a class on honeybee behavior (title: "Shaking the Swarm") to high school students at Legacy High School, in Broomfield CO, USA
2021	Lab members gave a public talk at Great Smokey Mountains National Park Science Colloquium 2021: "What trajectories of the Smokies' synchronous fireflies reveal about their behavior" https://dlia.org/event/science-colloquium-2021/

2020 Mentor at ATHENA By WiSTEM Summer Program for high-school girls https://www.athenabywistem.org/

2020 Invited to give a research and career talk for Woman Physicists at Bar Ilan University, Israel

2019 Invited to give a public talk about Honeybee research at MileHiveBeeClub, Denver CO, USA

2019 Wrote a science article, directed to undergraduate students, for Physics Today on "Mechanical Hive Mind" https://physicstoday.scitation.org/doi/10.1063/PT.3.4191

2019 Interviewed and participated in an exhibit called "Wonder Women: The Dynamic, Influential, and Innovative Scientists of CU Boulder," displayed in Gemmill Library, CU Boulder https://www.colorado.edu/libraries/2019/05/07/friends-libraries-fellow-exhibit-display

2019 Participant in Chords and Codons: Music About Science at the BioFrontiers CU Boulder (multidisciplinary multimedia with live and electronic music and visualizations) https://www.colorado.edu/biofrontiers/chords-and-codons

2019 Lecturer at Girls Day of Code — a day of coding, team-building, and talks from women in STEM and business in CU Boulder playfulcomputation.group/blog/student-run-girls-day-of-code

2019 Wrote a popular science article for The Conversation on "What a bundle of buzzing bees can teach engineers about robotic materials" https://theconversation.com/what-a-bundle-of-buzzing-bees-can-teach-engineers-about-robotic-materials-125194

2019 Gave a public talk about honeybee research at Ignite Boulder event: "Shaking the Swarm", Ignite Boulder 40 at Boulder Theater https://youtu.be/HY0CBmlTmZs

2018-2019 Skype with a Scientist sessions with middle schools students in Israel, Costa Rica and the USA https://www.skypeascientist.com/

2018 Lecturer at Code Wagon: Girls Computer Coding Camp a program to introduce girls and women to CS in CU Boulder

2018 Interviewed for the Buffs Talk Science (@CU Boulder) podcast on honeybee swarms https://buffstalkscience.com/2018/12/05/episode-17-something-something-temperature-regulation/

2016-2017 Mentor at the Mentoring Program of Harvard Graduate Women in Science connecting female graduate students in science, math, and engineering with faculty https://projects.iq.harvard.edu/hgwise/mentoring-program

2016 Mentor at ProjectCS Girls Competition for middle school girls (mentee, a 6th–grader, made it to the semifinals by building a virtual medical diagnostic program) https://www.projectcsgirls.com/

2015 Volunteer at Girls Who Code (Harvard Club) and Big Sister Boston https://girlswhocode.com/

Selected Press

2022 Interviewed for NPR story: "These photos are shedding new light on how fireflies interact with the world" https://www.npr.org/sections/pictureshow/2022/08/12/1114236533/pete-mauney-photographs-fireflies

2022 Interviewed for Harper's Magazine story: "Bright Flight: The mysteries of firefly synchrony" https://harpers.org/archive/2022/03/bright-flight-fireflies-collective-behavior-blink/

Accompanying podcast https://soundcloud.com/harpersmagazine/bright-flight-fireflies-complexity

2022 Interviewed for a popular-science podcast, Many Minds by The Templeton Foundation, on "The brilliant swarm" https://disi.org/the-brilliant-swarm/

2022 CU Boulder Highlight of the 2022 Cottrell Scholar Award https://www.colorado.edu/asmagazine/2022/03/01/computer-scientist-physicist-wins-cottrell-scholar-award

2022 Featured on the National Park Service story "OSip: Synchronous Fireflies at Congaree National Park" https://www.nps.gov/index.htm https://twitter.com/NatureNPS/status/1503397092483649538

2022 Featured on the Knox News story "How do fireflies synchronize? The secret could unlock semi-autonomous robot technology" https://eu.knoxnews.com/story/news/2022/06/17/great-smoky-mountains-synchronous-fireflies-2022-hold-secrets/7530268001/

2022 Interviewed for a popular-science podcast, TWIML AI, on "Collective Behavior of Honeybees & Fireflies" https://twimlai.com/

2021 Coverage of paper on collective synchronization in firefly swarm (Science Advances, 2021)
- New York Times (tinyurl.com/3vfud734)
- Science (tinyurl.com/4jye5wk2)
- CBC (tinyurl.com/anp53zw6)
- NPR (tinyurl.com/kfrvy6su)
- EcoWatch (tinyurl.com/4vmtravj)
- Axios (tinyurl.com/wrzmy2rb)
- Phys.org (tinyurl.com/d97vs2c4), and
- SFI News (tinyurl.com/f9b3xhm9)

2021 Coverage of paper on collective locomotion of worm blobs (Frontiers in Physics, 2021)
- New York Times (https://tinyurl.com/ypsvfvhk)
- Mashable (https://tinyurl.com/394wvffu)
- NSF What's Hot in Science (https://tinyurl.com/8zc9krw9)
- Phys.org (https://tinyurl.com/rn2nnme3), and
- SyFy (https://tinyurl.com/4r5dxb2a)

2021 Interviewed for CASW 2021 Newsroom: "'A Q&A with an academic polyglot who draws ideas from nature documentaries" https://casw.org/news/computer-scientist-studies-insect-swarms-to-guide-robot-design/

2021 Interviewed for The Guardian travel story: "'Magical': synchronous fireflies light up US national parks" https://www.theguardian.com/environment/2021/jun/11/fireflies-great-smoky-mountains-national-park

2021 Interviewed for a National Geographic travel story: "See fireflies magically light up this national park" https://www.nationalgeographic.com/travel/article/synchronous-fireflies-light-up-smoky-mountains-national-park

2021 Interviewed for a popular-science podcast, Complexity Podcast by Santa Fe Institute, on "Collective Behavior of Honeybees & Fireflies" https://complexity.simplecast.com/episodes/58

2021 Coverage of paper on collective scenting in honeybee swarm (PNAS, e2011916118, 2021)
- Science (tinyurl.com/w7epczh7)

Discover Magazine (tinyurl.com/s8f9xmvj)
Haaretz (tinyurl.com/4pnz2zsx)
ABC News (tinyurl.com/23222v7w)
InsideScience (tinyurl.com/35yfzr5k)
Phys.org (tinyurl.com/3zm2fes3), and
CU Boulder Daily news (tinyurl.com/3dpz5xmn)

2020 Firefly field-work featured on National Geographic
"A rare look at fireflies that blink in unison, in a forest without tourists"
https://www.nationalgeographic.com/animals/2020/06/synchronous-fireflies-rare-look-congaree-national-park/

2020 Coverage of spatiotemporal firefly flash patterns methods paper (J. R. Soc. Interface, 17:170, 2020)
Smithsonian Magazine (tinyurl.com/yx9dqaew)
Haaretz (tinyurl.com/y2y2796t)
Science Daily (tinyurl.com/yyzzm3ph)
Biomedical Picture of the Day (tinyurl.com/y382fwqz)
Science Alert (tinyurl.com/yy5pxtzq)
Phys.org (tinyurl.com/yxgom2jl), and
CU Boulder Daily news (tinyurl.com/y65j3fpv)

2019 Coverage of collective honeybee ventilation paper (J. R. Soc. Interface 16: 20180561, 2019)
SIAM News (tinyurl.com/yya8mge9)
Science Daily (tinyurl.com/y33gsdao)
Phys.org (tinyurl.com/yxp7kjct)
Harvard Gazette (tinyurl.com/y5bk98o3), and
CU Boulder Science Buffs (tinyurl.com/y49852h3)

2018 Coverage of honeybee swarm shaking paper (Nature Physics, doi s41567-018-0262-1, 2018)
SIAM News (tinyurl.com/yyj5xbpj)
New Scientist (tinyurl.com/y5yahz6n)
Forbes (tinyurl.com/y34rkyoy)
Phys.org (tinyurl.com/y5edmclp)
Harvard Gazette (tinyurl.com/yy2us8rg), and
CU Boulder Daily news (tinyurl.com/yylfnzjf)

2018 Interviewed for a Nature Podcast on "Bee Swarms Under Strain" https://www.nature.com/articles/d41586-018-06768-5 and associated Nature Video production https://youtu.be/jswSJznyvDI