Sean D. Lawley

Contact information

University of Utah
Department of Mathematics
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Research interests

Mathematical Biology, Probability and Stochastic Processes, Applied Mathematics

Employment

University of Utah
Associate Professor, 2021-present
Assistant Professor, 2016-2021
Research Assistant Professor, 2014-2016

Education

Duke University
Ph.D., Mathematics with Certificate in College Teaching, May 2014
Advisors: Jonathan C. Mattingly and Michael C. Reed
M.A., Mathematics, 2011

Carnegie Mellon University
B.S., Computational Finance, 2009

Grants and awards

- NSF DMS-2325258, 2023-2026: eMB: Collaborative Research: Stochasticity in ovarian aging and biotechnologies for menopause delay, $594,570 ($333,589 to Utah). PI: SD Lawley. co-PI: J Johnson (University of Colorado School of Medicine).
- NSF DMS-1944574, 2020-2025: CAREER: How diffusion, dimension, geometry, and redundancy affect cellular dynamics, $450,000 (Sole PI). Funded by DMS/Mathematical Biology and MCB/Cellular Dynamics and Function.
- NSF DMS-1814832, 2018-2023: Diffusion in stochastic environments: analysis and biological applications, $250,000 (Sole PI).
- SIAM Activity Group on Life Sciences Early Career Prize, 2018.
- NSF DMS RTG-1148230: Research training in mathematical and computational biology, $2,496,299 (co-PI 2016-2020).
- L.P. and Barbara Smith Award for Teaching Excellence, 2013.

Publications and preprints

(* denotes undergraduate student co-author, ** denotes graduate student co-author)

submitted

81. S Linn**, SD Lawley. Cover times with stochastic resetting. *Submitted*. (arXiv:2406.12154).
80. J Kim**, SD Lawley, J Kim. A reaction network model of microscale liquid-liquid phase separation reveals effects of spatial dimension. *Submitted*. (arXiv:2408.15303).
79. JB Madrid**, JP Keener, SD Lawley. Small fluctuations induce rapid extinction in stochastic population models. *Submitted*.
78. A Cengiz**, SD Lawley. Modifying the narrow escape time for imperfect reactions. *Submitted*.
77. SD Lawley. Competition of many searchers. Invited book chapter in "The Target Problem," editors: DS Grebenkov, R Metzler, G Oshanin. (arXiv:2310.02157).

2024

76. S Linn**, SD Lawley, BR Karamched, ZP Kilpatrick, K Josić. Fast decisions reflect biases; slow decisions do not. *Physical Review E*, 110(2), 2024. (arXiv:2401.00306).

75. S Linn**, SD Lawley. Hitting probabilities for fast stochastic search. *Journal of Physics A: Mathematical and Theoretical*, 57(30), 2024. (arXiv:2404.01142).

74. CE Plunkett**, SD Lawley. Boundary homogenization for partially reactive patches. *Multiscale Modeling and Simulation*, 22(2), 2024. (arXiv:2405.11310).

73. D Gomez, SD Lawley. First hitting time of a one-dimensional Lévy flight to small targets. *SIAM Journal on Applied Mathematics*, 84(3), 2024. (arXiv:2307.06274).

72. HR Tung, SD Lawley. Understanding and quantifying network robustness to stochastic inputs. *Bulletin of Mathematical Biology*, 86(55), 2024.

71. H Kim, SD Lawley. Cover times of many diffusive or subdiffusive searchers. *SIAM Journal on Applied Mathematics*, 84(2), 2024. (arXiv:2308.13417).

70. J Johnson, SD Lawley, JW Emerson, K Oktay. Modeling delay of age at natural menopause with planned tissue cryopreservation and autologous transplantation. *American Journal of Obstetrics & Gynecology*, 2024.

69. H Kim, SD Lawley. Cover times of many random walkers on a discrete network. *Physical Review E*, 109(1), 2024 (arXiv:2310.07905).

68. SD Lawley, MD Sammel, N Santoro, J Johnson. Mathematical recapitulation of the end stages of human ovarian aging. *Science Advances*, 10(2), 2024.

67. ED Clark**, SD Lawley. How drug onset rate and duration of action affect drug forgiveness. *Journal of Pharmacokinetics and Pharmacodynamics*, 2024.

2023 66. S Linn**, SD Lawley. First passage times under frequent stochastic resetting. *Physical Review E*, 108(2), 2023.

65. SD Lawley. Extreme statistics of superdiffusive Lévy flights and every other Lévy subordinate Brownian motion. *Journal of Nonlinear Science*, 33(53), 2023. (arXiv:2103.07851).

64. SD Lawley, J Johnson. Slowest first passage times, redundancy, and menopause timing. *Journal of Mathematical Biology*, 86(90), 2023.

63. SD Lawley, J Johnson. Why is there an "oversupply" of human ovarian follicles? *Biology of Reproduction*, 108(5), 2023.

62. CE Plunkett**, SD Lawley. Boundary homogenization for patchy surfaces trapping patchy particles. *Journal of Chemical Physics*, 158(9), 2023.

2022 61. AM Alexander**, SD Lawley. Inferences from FRAP data are model dependent: a subdiffusive analysis. *Biophysical Journal*, 121(20), 2022.

60. J Johnson, JW Emerson, SD Lawley. Recapitulating human ovarian aging using random walks. *PeerJ*, 10:e13941, 2022.

59. S Linn**, SD Lawley. Extreme hitting probabilities for diffusion. *Journal of Physics A: Mathematical and Theoretical*, 55(34), 2022. (arXiv:2110.11277).

58. ED Clark**, SD Lawley. Should patients skip late doses of medication? A pharmacokinetic perspective. *Journal of Pharmacokinetics and Pharmacodynamics*, 2022.

57. SD Lawley, HF Nijhout, MC Reed. Spiracular fluttering decouples oxygen uptake and water loss: a stochastic PDE model of respiratory water loss in insects. *Journal of Mathematical Biology*, 84(40), 2022.

56. NP McAllister*, SD Lawley. A pharmacokinetic and pharmacodynamic analysis of drug forgiveness. *Journal of Pharmacokinetics and Pharmacodynamics*, 2022.

55. ED Counterman*, SD Lawley. Designing drug regimens that mitigate nonadherence. *Bulletin of Mathematical Biology*, 84(20), 2022. (arXiv:2108.08358).
Awarded 2023 Lee A. Segel Best Student Paper Prize of the Society for Mathematical Biology.

2021 54. AM Alexander**, SD Lawley. Reaction-subdiffusion equations with species-dependent movement. *SIAM Journal on Applied Mathematics*, 81(6), 2021. (arXiv:2104.11151).

53. Y Bakhtin, T Hurth, SD Lawley, JC Mattingly. Singularities of invariant densities for random switching between two linear ODEs in 2D. *SIAM Journal on Applied Dynamical Systems*, 20(4), 2021. (arXiv:2009.01299).

52. ED Counterman*, SD Lawley. What should patients do if they miss a dose of medication? A theoretical approach. *Journal of Pharmacokinetics and Pharmacodynamics*, 2021. (arXiv:2102.05442).

51. G Handy, SD Lawley. Revising Berg-Purcell for finite receptor kinetics. *Biophysical Journal*, 120(11), 2021. (arXiv:2101.05956).

50. SD Lawley. Extreme first passage times of piecewise deterministic Markov processes. *Nonlinearity*, 34(5), 2021. (arXiv:1912.03438).

49. CE Plunkett**, SD Lawley. Bimolecular binding rates for pairs of spherical molecules with small binding sites. *Multiscale Modeling and Simulation*, 19(1), 2021. (arXiv:2002.11703).

48. SD Lawley. The effects of fast inactivation on conditional first passage times of mortal diffusive searchers. *SIAM Journal on Applied Mathematics*, 81(1), 2021. (arXiv:2003.05515).

2020 47. SD Lawley. Extreme first passage times for random walks on networks. *Physical Review E*, 102(6), 2020. (arXiv:2008.04496). *Promoted by the editors as an '**Editor's Suggestion**' featured article.*

46. SD Lawley. Subdiffusion-limited fractional reaction-subdiffusion equations with affine reactions: solution, stochastic paths, and applications. *Physical Review E*, 102(4), 2020. (arXiv:2008.09949).

45. SD Lawley. Anomalous reaction-diffusion equations for linear reactions. *Physical Review E*, 102(3), 2020. (arXiv:2008.11579).

44. SD Lawley. Extreme statistics of anomalous subdiffusion following a fractional Fokker-Planck equation: Subdiffusion is faster than normal diffusion. *Journal of Physics A: Mathematical and Theoretical*, 53(38), 2020. (arXiv:2004.14994).

43. JB Madrid**, SD Lawley. Competition between slow and fast regimes for extreme first passage times of diffusion. *Journal of Physics A: Mathematical and Theoretical*, 53(33), 2020. (arXiv:2004.05414).

42. SD Lawley, AE Lindsay, CE Miles. Receptor organization determines the limits of single-cell source location detection. *Physical Review Letters*, 125(1), 2020.

41. SD Lawley, V Shankar. Asymptotic and numerical analysis of a stochastic PDE model of volume transmission. *Multiscale Modeling and Simulation*, 18(2), 2020. (arXiv:1812.11680).

40. SD Lawley, MC Reed, HF Nijhout. Spiracular fluttering increases oxygen uptake. *PLOS ONE*, 15(5), 2020.

39. P Murphy**, PC Bressloff, SD Lawley. Interaction between switching diffusivities and cellular microstructure. *Multiscale Modeling and Simulation*, 18(2), 2020.

38. SD Lawley. Distribution of extreme first passage times of diffusion. *Journal of Mathematical Biology*, 80(7), 2020. (arXiv:1910.12170).

37. PC Bressloff, SD Lawley, P Murphy**. Effective permeability of a gap junction with age-structured switching. *SIAM Journal on Applied Mathematics*, 80(1), 2020.

36. SD Lawley. Universal formula for extreme first passage statistics of diffusion. *Physical Review E*, 101(1), 2020. (arXiv:1909.09883).

35. SD Lawley, JB Madrid**. A probabilistic approach to extreme statistics of Brownian escape times in dimensions 1, 2, and 3. *Journal of Nonlinear Science*, 2020. (arXiv:1907.07515).

2019 34. SD Lawley. Boundary homogenization for trapping patchy particles. *Physical Review E*, 100(3), 2019.

33. SD Lawley, CE Miles. Diffusive search for diffusing targets with fluctuating diffusivity and gating. *Journal of Nonlinear Science*, 29(6), 2019.

32. SD Lawley, CE Miles**. How receptor surface diffusion and cell rotation increase association rates. *SIAM Journal on Applied Mathematics*, 79(3), 2019.

31. SD Lawley, JB Madrid**. First passage time distribution of multiple impatient particles with reversible binding. *Journal of Chemical Physics*, 150(21), 2019. *Promoted by the editors as an '**Editor's pick**' featured article.*

30. SD Lawley, JP Keener. Electrodiffusive flux through a stochastically gated ion channel. *SIAM Journal on Applied Mathematics*, 79(2), 2019.

29. PC Bressloff, SD Lawley, P Murphy**. Protein concentration gradients and switching diffusions. *Physical Review E*, 99(3), 2019.

28. G Handy**, SD Lawley, A Borisyuk. Role of trap recharge time on the statistics of captured particles. *Physical Review E*, 99(2), 2019.

2018 27. SD Lawley. Blowup from randomly switching between stable boundary conditions for the heat equation. *Communications in Mathematical Sciences*, 16(4), 2018.

26. CE Miles**, SD Lawley, JP Keener. Analysis of non-processive molecular motor transport using renewal reward theory. *SIAM Journal on Applied Mathematics*, 78(5), 2018.

25. PC Bressloff, SD Lawley, P Murphy**. Diffusion in an age-structured randomly switching environment. *Journal of Physics A: Mathematical and Theoretical*, 51(31), 2018.

24. SD Lawley. A probabilistic analysis of volume transmission in the brain. *SIAM Journal on Applied Mathematics*, 78(2), 2018.

23. G Handy**, SD Lawley, A Borisyuk. Receptor recharge time drastically reduces the number of captured particles. *PLoS Computational Biology*, 14(3), 2018.

22. Y Bakhtin, T Hurth, SD Lawley, JC Mattingly. Smooth invariant densities for random switching on the torus. *Nonlinearity*, 31(4), 2018.

2017 21. PC Bressloff, BR Karamched**, SD Lawley, E Levien**. Diffusive transport in the presence of stochastically gated absorption. *Physical Review E*, 96(2), 2017.

20. SD Lawley, JP Keener. Rebinding in biochemical reactions on membranes. *Physical Biology*, 14(5), 2017.

19. PC Bressloff, SD Lawley. Hybrid colored noise process with space-dependent switching rates. *Physical Review E*, 96(1), 2017.

18. PC Bressloff, SD Lawley. Mean first passage times for piecewise deterministic Markov processes and the effects of critical points. *Journal of Statistical Mechanics: Theory and Experiment*, 063202, 2017.

17. PC Bressloff, SD Lawley. Temporal disorder as a mechanism for spatially heterogeneous diffusion. *Physical Review E - Rapid Communication*, 95(6), 2017.

16. PC Bressloff, SD Lawley. Residence times of a Brownian particle with temporal heterogeneity. *Journal of Physics A: Mathematical and Theoretical*, 50(19), 2017.

15. PC Bressloff, SD Lawley. Dynamically active compartments coupled by a stochastically-gated gap junction. *Journal of Nonlinear Science*, 27(5), 2017.

2016 14. SD Lawley, JP Keener. Including rebinding reactions in well-mixed models of distributive biochemical reactions. *Biophysical Journal*, 111(10), 2016.

13. PC Bressloff, SD Lawley. Diffusion on a tree with stochastically-gated nodes. *Journal of Physics A: Mathematical and Theoretical*, 49(24), 2016. *Named to the journal's '**Highlights of 2016**' collection.*

12. SD Lawley. Boundary value problems for statistics of diffusion in a randomly switching environment: PDE and SDE perspectives. *SIAM Journal on Applied Dynamical Systems*, 15(3), 2016.

11. SD Lawley, J Best, MC Reed. Neurotransmitter concentrations in the presence of neural switching in one dimension. *Discrete and Continuous Dynamical Systems - Series B*, 21(7), 2016.

2015 10. PC Bressloff, SD Lawley. Stochastically gated diffusion-limited reactions for a small target in a bounded domain. *Physical Review E*, 92(6), 2015.

9. PC Bressloff, SD Lawley. Escape from subcellular domains with randomly switching boundaries. *Multiscale Modeling and Simulation*, 13(4), 2015.

8. SD Lawley, M Tuft*, HA Brooks**. Coarse-graining intermittent intracellular transport: Two- and three-dimensional models. *Physical Review E*, 92(4), 2015.

7. SD Lawley, JP Keener. A new derivation of Robin boundary conditions through homogenization of a stochastically switching boundary. *SIAM Journal on Applied Dynamical Systems*, 14(4), 2015.

6. PC Bressloff, SD Lawley. Escape from a potential well with a randomly switching boundary. *Journal of Physics A: Mathematical and Theoretical*, 48(22), 2015.

5. PC Bressloff, SD Lawley. Moment equations for a piecewise deterministic PDE. *Journal of Physics A: Mathematical and Theoretical*, 48(10), 2015. *Chosen by editors as '**Publisher's pick**' featured article.*

4. SD Lawley, JC Mattingly, MC Reed. Stochastic switching in infinite dimensions with applications to random parabolic PDE. *SIAM Journal on Mathematical Analysis*, 47(4), 2015.

2014 3. SD Lawley, JC Mattingly, MC Reed. Sensitivity to switching rates in stochastically switched ODEs. *Communications in Mathematical Sciences*, 12(7), 2014.

2. SD Lawley, J Yun*, M Gamble, M Hall, MC Reed, HF Nijhout. Mathematical modeling of the effects of glutathione on arsenic methylation. *Theoretical Biology and Medical Modelling*, 11(20), 2014.

2011 1. SD Lawley, M Cinderella*, M Hall, M Gamble, HF Nijhout, MC Reed. Mathematical model insights into arsenic methylation. *Theoretical Biology and Medical Modelling*, 8(31), 2011.

Talks

Annual Meeting of the International Society for Medication Adherence — November 2024
Keynote Lecture
Naples, Italy

Fluctuations in Small Complex Systems — September 2024
Venice, Italy

Penn State University Theoretical Biology Seminar — September 2024
State College, USA

University of California, Riverside PDE and Applied Math Seminar — May 2024
Riverside, USA (remote seminar)

University of Notre Dame Applied Math Seminar — April 2024
Notre Dame, USA

Ohio State University Mathematical Biology Seminar — April 2024
Columbus, USA

University of Pittsburgh Mathematical Biology Seminar — April 2024
Pittsburgh, USA

New Jersey Institute of Technology Mathematical Biology Seminar — March 2024
Newark, USA

University of Pennsylvania Mathematical Biology Seminar — March 2024
Philadelphia, USA

Duke University Mathematical Biology Seminar — March 2024
Durham, USA

Florida Institute of Technology Mathematical Sciences Colloquium — February 2024
Melbourne, USA

University of Florida College of Medicine Lab for Systems Medicine Seminar — February 2024
Gainesville, USA

Florida State University Mathematical Biology Seminar — February 2024
Tallahassee, USA

Tulane University Applied Math Seminar — February 2024
New Orleans, USA

Rice University Center for Theoretical Biological Physics Seminar — January 2024
Houston, USA

University of Houston Mathematical Biology Seminar — January 2024
Houston, USA

Texas A&M University Stochastic Processes Seminar — January 2024
College Station, USA

Texas A&M University Mathematical Biology Seminar — January 2024
College Station, USA

University of Arizona Quantitative Biology Colloquium — January 2024
Tucson, USA

Arizona State University Mathematical Biology Seminar — January 2024
Tempe, USA

University of California, Irvine Applied and Computational Mathematics Seminar — January 2024
Irvine, USA

Washington State University Mathematical Biology Seminar — October 2023
Pullman, USA (remote seminar)

HBCU-MBCU — September 2023
(Historically Black Colleges and Universities Math Bio Colloquium for Undergrads)
Remote colloquium livestreamed to several HBCUs

ICIAM Minisymposium: — August 2023
Stochastic modeling in cell biology
Tokyo, Japan

Society for Mathematical Biology Annual Meeting — July 2023
Lee Segel Plenary Session
Columbus, USA

University of Pennsylvania Mathematical Biology Seminar — April 2023
Philadelphia, USA

Math Bio Workshop on Stochastic Spatial Dynamics Logan, USA	April 2023
University of Minnesota Mathematical Biology Seminar Minneapolis, USA (remote seminar)	September 2022
Duke University Mathematical Biology Seminar Durham, USA (remote seminar)	April 2022
University of New Mexico Applied Math Seminar Albuquerque, USA (remote seminar)	April 2022
Brandeis University Mathematical Biology Seminar Boston, USA (remote seminar)	October 2021
Dalhousie University Mathematics & Statistics Colloquium Halifax, Canada (remote colloquium)	September 2021
New Trends in Localized Patterns in PDEs Vancouver, Canada (remote meeting)	May 2021
SIAM Dynamical Systems Minisymposium: The interplay between dynamics and data science Portland, USA (made a virtual conference due to COVID-19)	May 2021
Indiana University Probability Seminar Bloomington, USA (remote seminar)	April 2021
ICMC Summer Meeting on Differential Equations Sao Carlos, Brazil (made a virtual conference due to COVID-19)	February 2021
University of Houston Mathematics Department Colloquium Houston, USA (remote colloquium)	January 2021
SIAM Life Sciences Minisymposium: Multiscale Modeling for Rules of Life Orange County, USA (minisymposium cancelled due to COVID-19)	June 2020
Mathematical and Computational Methods in Biology Mathematical Biosciences Institute, Ohio State University Columbus, USA (made a virtual conference due to COVID-19)	May 2020
University of Notre Dame Applied Math Seminar Notre Dame, USA (postponed due to COVID-19)	April 2020
Workshop on Differential Equations and Applications in Biology Orlando, USA (cancelled/postponed due to COVID-19)	March 2020
Utah State University Applied Math Seminar Logan, USA	January 2020
AMS Special Session: Multi-Scale Modeling of Complex Biological Systems Riverside, USA	November 2019
New Jersey Institute of Technology Applied Mathematics Colloquium	September 2019

Newark, USA

SIAM Dynamical Systems Minisymposium: Advances in reaction diffusion systems — May 2019
Snowbird, USA

Conference on Recent Advances in Pure and Applied Stochastics — March 2019
New Orleans, USA

Tufts University Mathematics Colloquium — March 2019
Boston, USA

Washington State University Mathematics Colloquium — January 2019
Pullman, USA

University of Neuchâtel Mathematics Colloquium — December 2018
Neuchâtel, Switzerland

Workshop on Advanced asymptotics in PDEs, probabilistic methods in statistical physics for extreme statistics, and rare events — September 2018
Pisa, Italy

Colorado State University Applied Math Seminar — September 2018
Fort Collins, USA

SIAM Life Sciences Minisymposium: Agent-based Modeling in the Life Sciences — August 2018
Minneapolis, USA

AMS Special Session: Biomathematics - Progress and Future Directions — April 2018
Portland, USA

SIAM Dynamical Systems Minisymposium: Random Dynamics in Microbiology — May 2017
Snowbird, USA

University of California, Irvine Applied and Computational Mathematics Seminar — March 2017
Irvine, USA

Tulane University Probability and Statistics Seminar — November 2016
New Orleans, USA

University of Alberta Applied Mathematics Institute Seminar — November 2016
Edmonton, Canada

University of Alberta Mathematical Biology Seminar — October 2016
Edmonton, Canada

AIMS Conference special session: Randomness meets life — July 2016
Orlando, USA

Frontier Probability Days — May 2016
Salt Lake City, USA

Stochastic and deterministic dynamics in networks workshop — February 2016
Mathematical Biosciences Institute, Ohio State University
Columbus, USA

University of Utah Special Colloquium — February 2016
Salt Lake City, USA

University of Arizona Special Colloquium — January 2016
Tucson, USA

JMM Minisymposium: Probability meets dynamics in biology — January 2016
Seattle, USA

University of Utah Joint Applied Math/Math Biology/Stochastics Seminar — December 2015
Salt Lake City, USA

University of Idaho Center for Modeling Complex Interactions Seminar — November 2015
Moscow, USA

University of Colorado Boulder Applied Mathematics Seminar — November 2015
Boulder, USA

University of British Columbia Stochastic Dynamics Seminar — September 2015
Vancouver, Canada

AMMCS-CAIMS Minisymposium: Topics in mathematical neuroscience — June 2015
Waterloo, Canada

SIAM Life Sciences Minisymposium: Mathematical questions in neural dynamics — August 2014
Charlotte, USA

Duke University Probability Seminar — December 2013
Durham, USA

University of Utah Mathematical Biology Seminar — October 2013
Salt Lake City, USA

SIAM Dynamical Systems Minisymposium: Stochastic dynamics on neuronal networks — May 2013
Snowbird, USA

Teaching

Current postdocs

Hwai-Ray Tung

Current PhD students

Anil Cengiz (University of Utah, expected graduation 2025)

Samantha Linn (University of Utah, expected graduation 2025)

Tory Richardson (University of Utah, expected graduation 2026)

Former PhD students

Elias Clark (University of Utah, graduated 2023)

Jacob Madrid (University of Utah, graduated 2023)

Claire Plunkett (University of Utah, graduated 2023)

Amanda Alexander (University of Utah, graduated 2022)

Courses

Introduction to Undergraduate Research, University of Utah — Spring 2023

Applied Complex Variables, University of Utah — Spring 2019

Introduction to Applied Mathematics, University of Utah — Fall 2018 and Fall 2020

Topics in Probability: Stochastic Processes, University of Utah — Spring 2018 and Spring 2022

Introduction to Partial Differential Equations, University of Utah — Fall 2017 and Fall 2023

Mathematical Biology I (PhD level), University of Utah — Fall 2022

Mathematical Biology I, University of Utah — Fall 2016 and Fall 2019

Mathematical Biology II, University of Utah — Spring 2016, Spring 2017, and Spring 2020

Introduction to Probability, University of Utah — Fall 2021 and Fall 2015

Differential Equations and Linear Algebra, University of Utah — Fall 2014

Math in Genetics and Genomics, Duke University — Spring 2014 and Spring 2013

Laboratory Calculus I, Duke University — Fall 2011

Education committees

Mathematics Education Committee, University of Utah — 2017-2020
University Mathematics Education Steering Committee, University of Utah — 2017-2018
University Advisory Council on Teacher Education, University of Utah — 2017-2020

Summer programs

Led a three week Summer High School Program in math biology, Summer 2023 and Summer 2024.

Led a one week Graduate School Preview in math biology for undergraduates from colleges around the US, Summer 2021, Summer 2022, Summer 2023, and Summer 2024.

Undergraduate research mentored

Alex Gilsoul (University of Utah, class of 2026) — Fall 2023
Mentored on a project on medication nonadherence.

Guang Yang (University of Utah, class of 2023) — Summer 2022
Mentored on a project on fractional differential equations.

Brian Bettinson (University of Utah, class of 2022) — Fall 2021
Mentored on a project on computational pharmacokinetic modeling.

Noel McAllister (University of Utah, class of 2022) — Spring and summer 2021
Mentored on a project on pharmacokinetic and pharmacodynamic modeling. Our work was accepted to the *Journal of Pharmacokinetics and Pharmacodynamics*.

Eiljah Counterman (University of Utah, class of 2024) — Academic year 2020-2021
Mentored on a project on stochastics in pharmacokinetics. Our work was published in the *Journal of Pharmacokinetics and Pharmacodynamics* and the *Bulletin of Mathematical Biology*.

Emma Coates (University of Utah, class of 2021) — Fall 2020

Mentored on a semester long project on extreme first passage times on discrete networks.

Taylor Yates (University of Utah, class of 2020) Fall 2019
Mentored on a semester long project on extreme first passage theory.

Hannah Choi (University of Utah, class of 2018) Academic year 2017-2018
Mentored on a project applying first passage processes to ecological questions.

Chong Wang (University of Utah, class of 2018) Summer 2017
and Bo Zhu (University of Utah, class of 2018)
Mentored both students on a summer long project using branching processes to study cancer progression.

Jacob Madrid (University of Utah, class of 2017) Fall 2016
Mentored on a project testing recently developed mathematical techniques for incorporating spatial-temporal correlations into well-mixed models.

Jacob Madrid (University of Utah, class of 2017) Summer 2016
Mentored on a project developing a new stochastic simulation algorithm for diffusion in the presence of a partially absorbing boundary.

Daniel Armstrong (University of Utah, class of 2016) Spring 2016
Mentored on a semester long project modeling neurite growth.

Marie Tuft (University of Utah, class of 2015) Academic year 2014-2015
Mentored on a yearlong honors thesis project modeling virus trafficking. Our work was published in *Physical Review E*.

Oliver Richardson (University of Utah, class of 2017) Academic year 2014-2015
Mentored on a yearlong project modeling learning on neural networks.

Braden Schaer (University of Utah, class of 2015) Academic year 2014-2015
and Anand Singh (University of Utah, class of 2016)
Mentored both students on a yearlong project modeling diffusion of neurotransmitters.

Adela Yang (Bowdoin College, class of 2016) Summer 2014
and Ana Martinez (Northeast Texas Community College, class of 2015)
Mentored both students during a mathematical biology workshop held at Duke University.
Project title: *Analysis and applications of phylogenetic trees.*

Jina Yun (Duke University, class of 2015) Summer 2013
Co-mentored with two Duke University professors. Our work modeling arsenic detoxification was published in *Theoretical Biology and Medical Modelling.*

Andrew Gao (Duke University, class of 2016) Summer 2013
Co-mentored during a mathematical biology REU on a cancer modeling project.
Project title: *Modeling the inhibition of angiogenesis.*

Charnelle Bland (Emory University, class of 2014) Summer 2012
and Kirsten Bell (Wheaton College, class of 2015)
Mentored both students during a mathematical biology workshop held at Duke University.
Project title: *Arsenic poisoning in Bangladesh and mathematical experimentation.*

Priyanka Nadar (Mary Baldwin College, class of 2012) Summer 2011
Co-mentored during a mathematical biology workshop held at Duke University.
Project title: *Mathematical insights into arsenic poisoning in Bangladesh.*

Molly Cinderella (Duke University, class of 2012) Summer 2010
Co-mentored with two Duke University professors. Our work modeling arsenic poisoning in

Bangladesh was published in *Theoretical Biology and Medical Modelling*.

Graduate committee work

Tory Richardson (Chair) (Oral exam Fall 2023)
Anil Cengiz (Chair) (Oral exam Fall 2023)
Samantha Linn (Chair) (Oral exam Spring 2023)
Jacob Madrid (Chair) (PhD defense Spring 2023)
Claire Plunkett (Chair) (PhD defense Spring 2023)
Elias Clark (Chair) (PhD defense Spring 2023)
Amanda Alexander (Chair) (PhD defense Spring 2022)
Cory Rindlisbacher (MSMT defense Spring 2022)
Alex Beams (Oral exam Spring 2021)
Cody Fitzgerald (PhD defense Spring 2021)
Anna Nelson (PhD defense Spring 2021)
Kees Mcgahan (Oral exam Spring 2020)
Rebecca Terry (PhD defense Fall 2020)
Liz Fedak (PhD defense Summer 2020)
Hyunjoong Kim (PhD defense Spring 2020)
Samantha Hill (PhD defense Spring 2020)
Kiersten Utsey (PhD defense Spring 2020)
Patrick Murphy (PhD defense Spring 2020)
Gaoyang (Bridget) Fan (PhD defense spring 2020)
Gregory Handy (PhD defense Spring 2019)
Andrew Watson (Oral exam Spring 2019)
Jessica Humphrey (MSMT defense Summer 2019)
Dave Winkler (MSMT defense Summer 2019)
Brooke Blair Cope (Chair) (MSMT defense Summer 2019)
Ethan Levien (PhD defense Spring 2018)
Heather Brooks (PhD defense Spring 2018)
Ben Hardisty (PhD defense Fall 2017) (biology department)

Other teaching experience

Led journal club for first and second year graduate students, University of Utah, Spring 2015 and Spring 2016.

Instructor for real analysis qualifying exam review, Duke University, August 2012 and 2011.

Teaching assistant for *Laboratory Calculus and Functions I*, Duke University, Fall 2009.

Teaching assistant for *Integration, Differential Equations and Approximation*, Carnegie Mellon University, Spring 2009.

Teaching assistant for *Differential and Integral Calculus*, Carnegie Mellon University, Fall 2008.

Service

Reviewer for

American Journal of Obstetrics & Gynecology, 2024
Annals of Applied Probability, 2018, 2015
Biophysical Journal, 2021, 2019
Biophysical Reports, 2021
Blood Advances, 2024
Bulletin of Mathematical Biology, 2024, 2023, 2022, 2022, 2021, 2020
Cambridge University Press, 2020
Chaos: An Interdisciplinary Journal of Nonlinear Science, 2022
Chaos, Solitons & Fractals, 2017

Chemical Engineering Science, 2022
Chemical Physics Letters, 2022
Discrete and Continuous Dynamical Systems - Series B, 2021, 2017, 2016, 2013
European Journal of Applied Mathematics, 2021
The European Physical Journal B, 2020
Frontiers in Medicine, 2024
International Journal of Bifurcation and Chaos, 2018
International Journal of Environmental Research and Public Health, 2020
Journal of Computational Science, 2023
Journal of Chemical Physics, 2023, 2022, 2022, 2021, 2020, 2019
Journal of Engineering Mathematics, 2020
Journal of Mathematical Biology, 2022, 2021, 2016, 2015
Journal of Nonlinear Science, 2019, 2018
Journal of Physics A: Mathematical and Theoretical, 2024, 2022, 2021, 2021, 2020, 2020
Journal of Physics Communications, 2018
Journal of Statistical Mechanics: Theory and Experiment, 2023, 2022, 2021
Journal of Statistical Physics, 2022
Journal of Theoretical Biology, 2019, 2017
Journal of Theoretical Probability, 2022
Knowledge-Based Systems, 2021
Mathematical Medicine & Biology, 2023
Mathematical Biosciences, 2024, 2022, 2017
Mathematical Biosciences and Engineering, 2019
Mayo Clinic Proceedings: Digital Health, 2023
Molecules, 2023
Multiscale Modeling and Simulation, 2020, 2020, 2016
Nature Communications, 2022
New Journal of Physics, 2020
Nonlinear Analysis: Hybrid Systems, 2019
Numerical Methods for Partial Differential Equations, 2020
Physical Review E, 2023, 2023, 2022, 2022, 2022, 2022, 2022, 2021, 2020
Physical Review Letters, 2024, 2024, 2023, 2022, 2022, 2021, 2021
Physica A, 2022, 2020
Physica Scripta, 2023, 2021
PLOS Computational Biology, 2024, 2023
PLOS ONE, 2019
Proceedings of the Royal Society A, 2021, 2016
Reproductive Sciences, 2024
Research in the Mathematical Sciences, 2020
SAGE Open Medicine, 2022
Scientific Reports, 2024, 2021, 2016
SIAM Journal on Applied Dynamical Systems, 2020, 2018
SIAM Journal on Applied Mathematics, 2024, 2023, 2022, 2022, 2021, 2020, 2020, 2019, 2017, 2016
SIAM Journal on Mathematical Analysis, 2021
Soft Matter, 2022
Springer Mathematics, 2015
Statistics and Probability Letters, 2019
Symmetry, 2020

Chair Theses Standards Committee (2020-2021).
Assistant Organizer for American Mathematical Society Math Research Community, June 2018.
Mathematics Education Committee, 2017-2020.
University Mathematics Education Steering Committee, 2017-2018.

University Advisory Council on Teacher Education, 2017-2018.
University Undergraduate Council, 2019-2020.
Center for Science and Mathematics Education Hiring Subcommittee, 2018-2019.
Transformative Excellence Program (TEP) Committee, 2017-2018.
Instructorship Committee, 2017-2018.
Colloquium and Distinguished Lecture Committee, 2016-2020.
College of Science Day Committee, 2016-2019.
Faculty Advisor to the University of Utah chapter of Sigma Phi Epsilon, 2014-2016.
Lectures to middle school math students, Northwest Middle School, Salt Lake City, UT, May 2015.
Lectures to high school math students, Riverside High School, Durham, NC, May 2013 and 2014.
Lectures to middle school math students, Central Middle School, Melbourne, FL, November 2010.