Alexandria Volkening

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Purdue University   *URL:*   https://www.alexandriavolkening.com
150 N. University St.   *Citizenship:* United States
West Lafayette, IN USA 47907   *Updated:*   February 9, 2024

Interests: Applied dynamical systems (emergent behavior and complex systems), agent-based and data-driven modeling, data analysis, PDEs, stochastic processes, math in biology and social science

Professional Appointments:

2021 Aug. –	Assistant Professor	Purdue University

- Department of Mathematics
- Weldon School of Biomedical Engineering (by courtesy)
- PULSe Interdisciplinary Life Science Program (affiliate)
- Computational Interdisciplinary Graduate Programs (affiliate)

2019 Jul. – 2021 Aug.	NSF–Simons Fellow	Northwestern University

- NSF–Simons Center for Quantitative Biology (CQuB)
- Engineering Sciences & Applied Mathematics (ESAM)

2017 Jun. – 2019 Jul.	Postdoctoral Fellow	Ohio State University

- Mathematical Biosciences Institute (MBI)

Education:

2017 May	Ph.D., Applied Mathematics	Brown University

- Advisor: Björn Sandstede
- Thesis: Modeling pattern formation on zebrafish

2012 May	M.S., Applied Mathematics	Brown University
2011 May	B.S., Mathematics	UMBC

- *Summa cum laude*, Honors in math, Meyerhoff Scholar Affiliate

Manuscripts Under Review:

- C Góngora-Canul, **A Volkening**, J Cuéllar, L Calderón, M Fernández-Campos, D Lee, J Salgado, A Cruz-Sancan, CD Cruz. "Effect of initial inoculum on the temporal and spatial dynamics of wheat blast under field conditions in Bolivia", *In minor revision*, 2023.

- WD Martinson, **A Volkening**, M Schmidtchen, C Venkataraman, JA Carrillo. "Linking discrete and continuous models of cell birth and migration", *In review*, arXiv:2308.16093, 2023.

Publications:

[13]   D Bhaskar, WY Zhang, **A Volkening**, B Sandstede, IY Wong. "Topological data analysis of spatial patterning in heterogeneous cell populations: I. Clustering and sorting with varying cell-cell adhesion", *npj Systems Biology and Applications*, 9(43), 2023.

[12]   E Cleveland[†], A Zhu[†], B Sandstede, ***A Volkening***. "Quantifying different modeling frameworks using topological data analysis: a case study with zebrafish patterns", *SIAM Journal on Applied Dynamical Systems*, 22(4), 2023.

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† (‡) denotes undergraduate (postbac) students mentored   ***Italic*** denotes corresponding author

[11] **A Volkening**. "A primer on data-driven modeling of complex social systems", Accepted (pending final approval of full volume), *Proceedings of Symposia in Applied Mathematics*, arXiv:2210.08636, 2023.

[10] J Benson, M Bessonov, K Burke, S Cassani, M-V Ciocanel, DB Cooney, **A Volkening**. "How do classroom-turnover times depend on lecture-hall size?", *Mathematical Biosciences and Engineering*, 20(5):9179–9207, 2023.

[9] K Mallory, J Abrams[†], A Schwartz[†], M-V Ciocanel, **A Volkening**, B Sandstede. "Influenza spread on context-specific networks lifted from interaction-based diary data", *Royal Society Open Science*, 8(191876), 2021.

[8] **A Volkening**, DF Linder, MA Porter, GA Rempala. "Forecasting elections using compartmental models of infection", *SIAM Review*, 62(4):837–865, 2020.

[7] **A Volkening**. "Linking genotype, cell behavior, and phenotype: multidisciplinary perspectives with a basis in zebrafish patterns", *Current Opinion in Genetics and Development*, 63, 2020.

[6] **A Volkening**, MR Abbott[†], N Chandra[†], B Dubois[†], F Lim[†], D Sexton[†], B Sandstede. "Modeling stripe formation on growing zebrafish tailfins", *Bulletin of Mathematical Biology*, 82(56), 2020.

[5] MR McGuirl, **A Volkening**, B Sandstede. "Topological data analysis of zebrafish patterns", *Proceedings of the National Academy of Sciences of the USA*, 117(10), 2020.

[4] Y Chen, J Gemmer, M Silber, **A Volkening**. "Noise-induced tipping under periodic forcing: Preferred tipping phase in a non-adiabatic forcing regime", *Chaos*, 29(4), 2019.

[3] **A Volkening**, B Sandstede. "Iridophores as a source of robustness in zebrafish stripes and variability in *Danio* patterns", *Nature Communications*, 9(3231), 2018.

[2] **A Volkening**, B Sandstede. "Modelling stripe formation in zebrafish: an agent-based approach", *Journal of the Royal Society Interface*, 12(112), 2015.

[1] JL Gevertz, Z Aminzare, KA Norton, J Pérez-Velázquez, **A Volkening**, KA Rejniak. "Emergence of anti-cancer drug resistance: exploring the importance of the microenvironmental niche via a spatial model", in "Applications of Dynamical Systems in Biology and Medicine", *IMA Volumes in Mathematics and its Applications*, 158, Springer-Verlag, A Radunskaya, T Jackson (eds.), 2015.

Expository Articles:

[4] B Shirman[‡], **A Volkening**. "What does math have to do with patterns in fish?", *Frontiers for Young Minds*, 10:834049, 2022.

[3] HZ Brooks, Y Chen, M Feng, Y Kureh, MA Porter, **A Volkening**. "How to move a SIAM minisymposium online from the comfort of your home", *DSWeb: The Dynamical Systems Web*, July 2020.

[2] **A Volkening**, B Sandstede. "How zebrafish get their stripes... or spots", *SIAM News*, 53(2), 2020.

[1] **A Volkening**. "How the zebrafish got its stripes", *The Conversation*, 17 September, 2018.

Press Coverage & Cover Articles:

2020	Publication [8] featured as a SIAM research nugget
2020	Publication [8] described in an article in *Forbes*
2020	Publication [8] in a SIAM press release (reproduced by the California Business Journal)
2020	Publication [8] in Northwestern News (reproduced by SciTechDaily, Science Daily, others)
2020	Publication [5] highlighted in the AMS Mathematics in the Media column
2020	Publication [5] in Brown News (reproduced by Science Daily, Phys.org, others)
2019	Publication [3] recommended through the Faculty of 1000 Prime program

2018 –	Publication [3] featured as a research highlight on the NSF Math. Sciences Institutes webpage
2018	Publication [3] highlighted on the NSF Science360 website
2018	Publication [3] in Ohio State News (reproduced by ANI News, Big News Network, others)
2017	SIAM Conf. on Applications of Dyn. Systems presentation featured in the SIAM News Blog
2015	Publication [2] in Fusion News and Brown News (reproduced by Science Daily, Futurity, others)
2015	Publication [2] selected as cover image for *Journal of the Royal Society Interface*, 12(113)

Grant Proposals under Review:

- **A Volkening** (PI), "Data-driven modeling of complex systems with a basis in zebrafish patterns", Simons Foundation Travel Support for Mathematicians, $42,000, *In review.*

- **A Volkening** (PI), "REU Site: Forecasting U.S. Elections (FUSE) Research for Undergraduates", National Science Foundation REU Sites, $289,177, *In review.*

- **A Volkening** (PI), Y Zhou (Purdue Botany & Plant Pathology, co-PI), "DMS/NIGMS 1: A biology–mathematics approach to elucidate stem cell dynamics in *Ceratopteris* gametophytes", National Science Foundation DMS/NIGMS, $599,777, *In review.*

Grants:

- **A Volkening** (PI), "Optimal transport and topological techniques for patterns in biology", SIAM–Simons Undergraduate Summer Research Program (via Simons Foundation grant no. 1036702), $37,881, Sum. 2024.

- **A Volkening** (co-PI), Y Zhou (Purdue Botany & Plant Pathology, co-PI), "A biomathematical approach to meristem formation in fern gametophytes", NSF–Simons Center for Quantitative Biology Pilot Project Program, $48,000, 2022–2023.

Example Travel Grants and Student Funding (> 25 received):

- *AIM SQuaRE Award*
  - Collaborative project "Learning and analyzing differential equations from stochastic agent-based models" (with MV Ciocanel, K Flores, J Nardini, E Rutter, S Sindi) — 2023 – 2025
- *Collaborate@ICERM Award*
  - Collaborative project "Modeling candidate momentum in U.S. primary elections using campaign contributions" (with I Aguiar, K Landgren, S Linn, and S Zhang) — 2024 May
  - Collaborative project "Mathematical models of pedestrian movement in large lecture halls" (with J Benson, M Bessonov, K Burke, S Cassani, D Cooney, MV Ciocanel) — 2021 Jun.
- *Northwestern Undergraduate Research Assistant Program Award*
  - $3500 to support undergraduate student research at Northwestern — 2020 Oct.
  - $3750 to support undergraduate student research at Northwestern — 2020 May
- *SIAM Early Career Travel Award*
  - $650 to participate in the SIAM Workshop on Network Science (prior to virtual transition) — 2020 Jul.
  - $650 to participate in the SIAM Conf. on Applications of Dynamical Systems — 2019 May
  - $650 to participate in the SIAM Conf. on the Life Sciences — 2018 Aug.
- *AWM–NSF Travel Grant*
  - $1500 to participate in the Isaac Newton Institute Workshop on Collective Behaviour — 2023 Aug.
  - $2300 to participate in the SIAM Conf. on Applications of Dynamical Systems — 2019 May
- *Institut Mittag-Leffler Fellowship*
  - $1526 to participate in the Mathematical Biology emphasis semester — 2018 Oct.
- *US Junior Oberwolfach Fellowship*
  - $1000 to participate in the Workshop on Diff. Eqns. arising from Organizing Principles in Bio. — 2018 Sep.

Selected Invited Long Program Visits:

2023 Fall   Maths of Movement, Isaac Newton Institute, Cambridge, UK (my dates: Aug. 4 – Nov. 29)

2018 Fall   Mathematical Biology, Institut Mittag-Leffler, Djursholm, Sweden (my dates: Sep. 29 – Oct. 24)

Selected Awards:

2021	Fletcher Prize for Excellence in Research Mentorship, Northwestern University
	○ Based on nominations by my undergraduate student researchers
2019	Finalist, Capturing the Beauty of Science: Scientific Image Contest, Northwestern University
	○ Image titled "Simulating fish patterns" displayed at Evanston Township High School
2019	2nd Place Flash Talk, Statewide User Group Conference, Ohio Supercomputer Center
2017	Stella Dafermos Award, Division of Applied Mathematics, Brown University
2017	Graduate Speaker, Doctoral Commencement Ceremony, Brown University
2011 – 2015	National Science Foundation Graduate Research Fellowship
2011	Valedictorian, University of Maryland Baltimore County (UMBC)
2011	Phi Beta Kappa Honors Society
2011	Outstanding Senior in Mathematics, UMBC
2010	Outstanding Teaching Assistant in Mathematics, UMBC
2007 – 2011	President's List, UMBC
2007 – 2011	Premier Scholarship (full tuition, room, and board), UMBC

Invited Talks (118 total):

- *Invited Conference Talks (plenary, keynote, or equivalent)* (**5**)
  - Dynamics Days, Davis, CA   2024 Jan.
  - EMBO Course: Comput. Modelling of Multicellular Systems (EMBL Barcelona), Cyberspace   2023 Jun.
  - Indiana Mathematics REU Conference, Indianapolis, IN   2022 Jul.
  - Lorentz Center Summer School: Modeling Shape & Size in Biol. Dev., Cyberspace   2020 Aug.
  - New Frontiers in Pattern Formation Workshop, Cardiff, UK (virtual)   2018 Dec.
- *Invited Seminars or Colloquia* (**70**)
  - Kennesaw State University Mathematics Colloquium, Cyberspace   2024 Fall
  - University of Houston PDE Seminar, Houston, TX   2024 Mar.
  - University of Nottingham Mathematical Medicine and Biology Seminar, Cyberspace   2024 Feb.
  - UIUC Mathematical Biology Seminar, Champaign, IL   2024 Feb.
  - EPFL Applied Topology Seminar, Lausanne, Switzerland   2023 Nov.
  - University College London Applied Maths Seminar, London, UK   2023 Nov.
  - University of Alberta Math Bio Seminar, Cyberspace   2023 Nov.
  - University of Helsinki Seminar at HiLIFE, Helsinki, Finland   2023 Nov.
  - University of Sussex Mathematics and Applications Sussex Seminar, Brighton, UK   2023 Nov.
  - University of Sheffield Mathematical Biology Seminar, Sheffield, UK   2023 Nov.
  - University of Oxford Mathematical Biology and Ecology Seminar, Oxford, UK   2023 Oct.
  - Indianapolis University–Purdue University, Indianapolis REU Colloquium, Cyberspace   2023 Jul.
  - New York University Mostly Biomathematics Lunchtime Seminar, New York, NY   2023 Mar.
  - Rice University Center for Theoretical Biological Physics Seminar, Houston, TX   2023 Jan.
  - Brigham Young University Applied Analysis Seminar, Provo, UT   2022 Dec.
  - DePaul University Summer REU Seminar, Chicago, IL   2022 Jul.
  - Johns Hopkins University Mathematical Institute for Data Science Seminar, Baltimore, MD   2022 Apr.
  - Georgia Tech Mathematical Biology Seminar, Cyberspace   2022 Mar.
  - New York University Computational Biology and Medicine Colloquium, Cyberspace   2022 Mar.

- UC San Diego Mathematics Seminar, Cyberspace — 2022 Feb.
- Caltech Computational Mathematics + X Seminar, Cyberspace — 2022 Jan.
- POSTECH (Korea) MINDS Seminar, Cyberspace — 2021 Nov.
- University of Melbourne Mathematical Biology Seminar, Cyberspace — 2021 Oct.
- Institute of Mathematics of Toulouse (France) Mathematical Biology Seminar, Cyberspace — 2021 Sep.
- Mathematical Biosciences Institute REU Seminar Series, Cyberspace — 2021 Jun.
- Technische Universität Dresden Mathematics Seminar, Cyberspace — 2021 Apr.
- University of Kentucky Applied Mathematics Seminar, Cyberspace — 2021 Apr.
- Claremont Center for the Mathematical Sciences Colloquium, Cyberspace — 2021 Apr.
- University of Birmingham Applied Mathematics Seminar, Cyberspace — 2021 Mar.
- Virginia Tech Mathematical Biology Seminar, Cyberspace — 2021 Mar.
- University of Nottingham Mathematical Medicine and Biology Seminar, Cyberspace — 2021 Mar.
- Brandeis University Special Mathematics Seminar, Cyberspace — 2021 Feb.
- Northeastern University Mathematics Colloquium, Cyberspace — 2021 Feb.
- Purdue University Mathematics Colloquium, Cyberspace — 2021 Feb.
- University of Western Ontario Mathematics Colloquium, Cyberspace — 2021 Feb.
- Dartmouth College Applied and Computational Mathematics Seminar, Cyberspace — 2021 Jan.
- Tulane University Mathematics Colloquium, Cyberspace — 2021 Jan.
- George Mason University Mathematics Colloquium, Cyberspace — 2021 Jan.
- UC Irvine Special Mathematics Colloquium, Cyberspace — 2021 Jan.
- North Carolina State University Special Mathematics Seminar, Cyberspace — 2021 Jan.
- UCLA Special Applied Mathematics Seminar, Cyberspace — 2020 Dec.
- UC Riverside Interdisc. Center for Quant. Modeling in Biology/AWM Seminar, Cyberspace — 2020 Nov.
- PIMS/University of British Columbia Rising Stars Colloquium, Cyberspace — 2020 Oct.
- UC Davis Mathematical Biology Seminar, Cyberspace — 2020 Oct.
- University of Pennsylvania Mathematical Biology Seminar, Cyberspace — 2020 Oct.
- Duke University Mathematical Biology Seminar, Cyberspace — 2020 Sep.
- University of British Columbia Mathematical Biology Seminar, Cyberspace — 2020 Sep.
- Mathematical Biosciences Institute REU Seminar Series, Cyberspace — 2020 Jun.
- Ohio State University Applied Math Seminar, Columbus, OH — 2020 Jan.
- Williams College Data Science Bootcamp, Cyberspace — 2020 Jan.
- Special Seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany — 2019 Nov.
- University of Minnesota Dynamical Systems Seminar, Minneapolis, MN — 2019 Oct.
- University of Notre Dame Applied Math Seminar, Notre Dame, IN — 2019 Sep.
- Case Western Reserve University Applied Math Seminar, Cleveland, OH — 2019 Mar.
- UC Irvine Special Math Colloquium/Biophysics & Systems Biology Seminar, Irvine, CA — 2019 Feb.
- University of North Carolina at Chapel Hill Special Seminar, Chapel Hill, NC — 2019 Feb.
- Boston University Dynamical Systems Seminar, Boston, MA — 2019 Jan.
- Special seminar, NSF–Simons Center for Quantitative Biology, Evanston, IL — 2019 Jan.
- Special seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany — 2018 Oct.
- Leiden University Informal Analysis Seminar, Leiden, Netherlands — 2018 Oct.
- Ohio Wesleyan University Science Lecture Series, Delaware, OH — 2018 Sep.
- Seminar, Ohio Wesleyan University, Delaware, OH — 2018 Sep.
- University of Bath Centre for Mathematical Biology Seminar, Bath, UK — 2018 Feb.
- Group Meeting, University of Oxford Wolfson Centre for Math Biology, Oxford, UK — 2018 Feb.
- University of Surrey Mathematics of Life & Social Sciences Seminar, Surrey, UK — 2018 Feb.
- College of Wooster Bio/Physics Colloquium, Wooster, OH — 2017 Oct.
- MIT Numerical Methods for PDEs Seminar, Cambridge, MA — 2017 Mar.

- ○ Seminar, Harvard School of Engineering & Applied Sciences, Cambridge, MA — 2017 Jan.
- ○ Penn State Theoretical Biology Seminar, State College, PA — 2016 Nov.
- ○ Special Seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany — 2015 Apr.

- *Invited Minisymposium Conference Talks (or workshop or equivalent)* (**43**)
  - ○ Minisymposium, SIAM Annual Meeting, Spokane, WA — 2024 Jul.
  - ○ Invited symposium, American Physical Society March Meeting, Minneapolis, MN — 2024 Mar.
  - ○ Special session (related to complex systems), Joint Mathematics Meetings, San Francisco, CA — 2024 Jan.
  - ○ Special session (related to TDA), Joint Mathematics Meetings, San Francisco, CA — 2024 Jan.
  - ○ Crash Course, Online Undergrad. Resource Fair for the Advancement and Alliance of Marginalized Mathematicians (OURFA^{2}M^2), Cyberspace — 2023 Nov.
  - ○ Isaac Newton Institute Workshop on Measures & Rep. of Interactions, Cambridge, UK — 2023 Sep.
  - ○ Isaac Newton Institute Workshop on Collective Behaviour, Cambridge, UK — 2023 Aug.
  - ○ Workshop on Neurosc., Coll. Migration & Parameter Est., University of Oxford, Oxford, UK — 2023 Jul.
  - ○ Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Portland, OR — 2023 May
  - ○ Special session, Joint Mathematics Meetings, Boston, MA — 2023 Jan.
  - ○ Special session, AMS Fall Eastern Sectional Meeting, Amherst, MA — 2022 Oct.
  - ○ Minisymposium, SIAM Conf. on Mathematics of Data Science, San Diego, CA — 2022 Sep.
  - ○ Minitutorial, SIAM Conf. on the Life Sciences, Pittsburgh, PA — 2022 Jul.
  - ○ BIRS Workshop: Emergent Collective Behaviors: Simulation & Experiment, Cyberspace — 2022 May
  - ○ Special session, Joint Mathematics Meetings, Cyberspace — 2022 Apr.
  - ○ ICERM Workshop on Geometric and Topological Methods in Data Science, Cyberspace — 2021 Dec.
  - ○ Special session, AMS Fall Southeastern Sectional Meeting, Cyberspace — 2021 Nov.
  - ○ BIRS Workshop: Math of the Cell, Integrating Signaling, Transport, & Mechanics, Cyberspace — 2021 Oct.
  - ○ Minisymposium, Society for Mathematical Biology Annual Meeting, Cyberspace — 2021 Jun.
  - ○ Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Cyberspace — 2021 May
  - ○ Special session, Joint Mathematics Meetings, Cyberspace — 2021 Jan.
  - ○ Southeast Center for Mathematics and Biology Annual Symposium, Cyberspace — 2020 Dec.
  - ○ Minisymposium, SMB/ESMTB Annual Meeting, Cyberspace — 2020 Aug.
  - ○ Minisymposium, SIAM/CAIMS Annual Meeting, Cyberspace — 2020 Jul.
  - ○ Minisymposium, SIAM Conf. on the Life Sciences, Golden Grove, CA (conference postponed) — 2020 Jun.
  - ○ MBI Workshop on Mathematical & Computational Methods in Biology, Cyberspace — 2020 May
  - ○ Minisymposium, SIAM Conf. on Mathematics of Data Science, Cyberspace — 2020 May
  - ○ BIRS Workshop: Bridging Cell. & Tissue Dyn. from Normal Dev. to Cancer, Banff, Alberta — 2019 Jun.
  - ○ Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT — 2019 May
  - ○ Special session, Joint Mathematics Meetings, Baltimore, MD — 2019 Jan.
  - ○ 1010 Workshop on Mathematical Biology, Instiut Mittag-Leffler, Djursholm, Sweden — 2018 Oct.
  - ○ MBI Workshop on Modeling & Analysis of Dynamic Social Networks, Columbus, OH — 2018 Oct.
  - ○ Minisymposium, SIAM Conf. on the Life Sciences, Minneapolis, MN — 2018 Aug.
  - ○ BIRS Workshop: Mathematics of the Cell, Banff, Alberta — 2018 Aug.
  - ○ Minisymposium, European Conf. on Mathematical & Theoretical Biology, Lisbon, Portugal — 2018 Jul.
  - ○ Special session, AMS Spring Central Sectional Meeting, Columbus, OH — 2018 Mar.
  - ○ Minisymposium, SIAM Conf. on Analysis of PDEs, Baltimore, MD — 2017 Dec.
  - ○ Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT — 2017 May
  - ○ Minisymposium, SIAM Conf. on Nonlinear Waves & Coherent Structures, Philadelphia, PA — 2016 Aug.
  - ○ Minisymposium, SIAM Conf. on the Life Sciences, Boston, MA — 2016 Jul.
  - ○ Minisymposium, SIAM Annual Meeting, Boston, MA — 2016 Jul.
  - ○ Minisymposium, SIAM Conf. on Analysis of PDEs, Scottsdale, AZ — 2015 Dec.
  - ○ Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT — 2015 May

○ Minisymposium, SIAM Conf. on Nonlinear Waves & Coherent Structures, Cambridge, UK 2014 Aug.

Other Local Seminar Talks:

- *At Purdue University* (**8**)
  - ○ Purdue University Computational & Applied Math Seminar, West Lafayette, IN 2023 Mar.
  - ○ Purdue University Bridge-to-Research Seminar, West Lafayette, IN 2022 Oct.
  - ○ Purdue University Bridge-to-Research Seminar, West Lafayette, IN 2022 Feb.
  - ○ Purdue University Comparative Pathobiology Seminar, West Lafayette, IN 2021 Dec.
  - ○ Purdue University PDE & Analysis Seminar, West Lafayette, IN 2021 Dec.
  - ○ Purdue University Computational & Applied Math Seminar, West Lafayette, IN 2021 Sep.
  - ○ Purdue University Bridge-to-Research Seminar, West Lafayette, IN 2021 Sep.
  - ○ Purdue University Biomedical Engineering Seminar, West Lafayette, IN 2021 Aug.
- *Prior to Purdue University*
  - ○ **22** additional local talks while at Northwestern, Ohio State, or Brown (e.g., the OSU TDAI Computational Social Sciences Brown Bag Series, the OSU/MBI Data Analytics Seminar, and the Brown–BU PDE Seminar)

Contributed & Workshop Talks:

2021 Jun.	Workshop on Mathematical and Computational Biology, Cyberspace
2020 Dec.	New Math at the Interface Workshop (CQuB Conf. on Quant. Approaches in Biology), Cyberspace
2020 Jul.	SIAM Workshop on Network Science, Cyberspace
2019 Oct.	CMCF Annual Symposium on Multiscale Cell Fate, Irvine, CA
2019 Jul.	Society for Mathematical Biology Annual Meeting, Montreal Québec
2019 Apr.	Rising Stars Workshop for Women in Computational & Data Sciences, Austin, TX
2019 Jan.	Joint Mathematics Meetings, Baltimore, MD
2017 Jul.	SIAM Annual Meeting, Pittsburgh
2017 Mar.	WINRS New England Meeting, Providence, RI
2017 Jan.	Dynamics Days (flash talk), Silver Spring, MD
2016 Apr.	RPI Applied Math Days, Troy, NY
2015 Jul.	Pattern Formation Workshop, Halifax, Canada

Posters:

2020 Jul.	Society for Developmental Biology Annual Meeting, Cyberspace
2019 Oct.	CMCF Annual Symposium on Multiscale Cell Fate, Irvine, CA
2019 Sep.	CQuB Conference on Quantitative Approaches in Biology, Evanston, IL
2019 Jun.	MBI Summit on the Rules of Life, Columbus, OH
2019 Jun.	BIRS Workshop: Bridging Cell. & Tissue Dyn. from Normal Dev. to Cancer, Banff, Alberta
2019 Apr.	Rising Stars Workshop for Women in Computational & Data Sciences, Austin, TX
2019 Jan.	Dynamics Days, Evanston, IL
2018 Aug.	BIRS Workshop: Mathematics of the Cell, Banff, Alberta
2018 Jul.	European Conf. on Mathematical & Theoretical Biology, Lisbon, Portugal
2018 Apr.	MBI Emphasis Workshop on Multiscale Dynamics of Infection, Columbus, OH
2018 Apr.	OSU College of Public Health Research Showcase, Columbus, OH
2018 Mar.	MBI Emphasis Workshop on Socioepidemiology, Columbus, OH
2017 Dec.	SIAM Conf. on Analysis of PDEs, Baltimore, MD
2017 Aug.	ICERM Workshop on Pedestrian Dynamics, Providence, RI
2017 Jan.	Dynamics Days, Silver Spring, MD

2016 Jun.	Conference on Analysis of PDEs using Dynamical Systems Techniques, Boston, MA
2016 Jan.	Opening Workshop: Isaac Newton Institute Programme on Stoch. Dyn. Systems, Cambridge, UK
2014 May	Stability of Solitary Waves, Centro di Ricerca Matematica Ennio De Giorgi, Pisa, Italy
2010 Apr.	1st Chesapeake SIAM Student Conference, Baltimore, MD

University Talks:

2017 May	Doctoral Commencement Address, Brown University, Providence, RI
2011 May	Valedictorian Address, UMBC, Baltimore, MD

Teaching Experience:

- *Instructor of Record*
  - Mathematical Biology (MA 59800, graduate special topics), Purdue University
    - — Teaching evaluation: 4.93/5   2023 Spring
  - Differential Equations & PDEs for Engineering & the Sciences (MA 30300), Purdue University
    - — Teaching evaluation: 4.62/5   2022 Fall
  - Ordinary Differential Equations (MA 26600), Purdue University
    - — Teaching evaluation: TBD (two sections)   2024 Spring
    - — Teaching evaluation: 4.55/5   2022 Spring
    - — Teaching evaluation: 4.66/5   2021 Fall
  - Projects Special (research course), Northwestern University   2020 Spring, Fall
  - Linear Algebra & Differential Equations for Engineers, Ohio State University   2019 Spring
    - — Teaching evaluation: 4.46/5
- *Instructor*
  - NSF–Simons Center Workshop: Intro to Building Models, Northwestern University   2020 Jul.
    - — Co-developed and instructed a 2-day virtual workshop on building models for an interdisciplinary, biological audience (PhD level)
  - Multivariable Calculus, Catalyst Summer Bridge Program, Brown University   2015 Summ.
    - — Designed and led a week-long math curriculum for incoming freshmen
- *Project Mentor/Discussion Leader*
  - Modeling Shape & Size in Biological Development (PhD level), Lorentz Center   2020 Aug.
  - Health & Science Reporting (Medil journalism class), Northwestern University   2020 Feb.
  - Calculus for the Life Sciences, Ohio State University   2017, 2018 Nov.
- *Guest Lecturer*
  - Mathematics as a Profession and Discipline (MA 10800), Purdue University   2022 Fall
  - Topological Data Analysis (graduate course), Brandeis University   2022 Spring
  - Mathematics of Democracy, Harvey Mudd College   2021 Fall
  - Methods of Applied Mathematics II, Brown University   2021 Summ.
  - Special Topics: Modeling Social Systems, Northwestern University   2020 Spring
  - Probability and Statistics, Ohio State University   2019 Spring
  - Foundations of Higher Mathematics, Ohio State University   2019 Spring
  - Beginning Scientific Computing, Ohio State University   2019 Spring
  - Methods of Applied Mathematics I, Brown University   2013 Fall
- *Co-Instructor*
  - Business Mathematics, Community College of RI in correctional facilities   2014 Spring
  - Basic College Math, Community College of RI program in correctional facilities   2013 Fall
- *Teaching Assistant*
  - Methods of Applied Mathematics I (ODEs), Brown University   2013 Spring, 2013 Fall

- ○ Honors Calculus I, UMBC   2009 Fall, 2010 Fall
- *Grader*
  - ○ Real Analysis II, UMBC   2011 Spring

Postdoctoral Scholar and Doctoral Student Research Mentorship:

- *Postdoctoral Scholar Research, Purdue University*
  - ○ Kyung Ha (Department of Mathematics)   2022 Aug. – 2023 Apr.
    - — Project: Modeling and topological techniques in plant biology
- *Doctoral Student Research, Purdue University*
  - ○ Daniel Tolosa (Department of Mathematics)   2021 Dec. –
    - — Project: Topological techniques for quantifying biological pattern formation across time
    - — Daniel's PhD Advisor: Manuel Rivera
- *Reading Courses (rotation-style research), Purdue University*
  - ○ Tianna Burke (Department of Mathematics) on relating microscopic models   2024 Spring
  - ○ Tifany Burnett (Department of Mathematics) on TDA for biological patterns   2024 Spring
  - ○ Bhakti Vyas (Department of Mathematics) on data-driven modeling   2024 Spring
  - ○ Jax Mader (Department of Mathematics) on TDA for biological patterns   2023 Summ.
- *Thesis, Advisory, or Qualifying Examination Committees, Purdue University*
  - ○ Trevor Shoaf (Weldon School of Biomedical Engineering)   2023 Nov. –
  - ○ Xinyi Li (Interdisciplinary Life Science PULSe)   2023 Sep. –
  - ○ Omar Sameh Eldaghar (Department of Mathematics)   2023 Mar. –
  - ○ Alexis Lynn Hoerter (Weldon School of Biomedical Engineering)   2022 Jan. –

Postbac Student Research Mentorship:

- *Implementing a zebrafish cellular automaton model online*   2020 Jan. – Sep.
  - ○ Blake Shirman (Current: MS Student, Mathematics, DePaul University)

Undergraduate Student Research Mentorship (37 students):

- *Mathematical modeling to forecast the 2024 U.S. elections*
  - ○ Joseph Cromp (Mathematics, Purdue University 2025)   2024 Jan. –
  - ○ Thanmaya Pattanashetty (Computer Science, Purdue University 2025)   2024 Jan. –
  - ○ Alexia Rodrigues (Mathematics, Purdue University 2024)   2024 Jan. –
- *Software to make images of simulated biological patterns look more realistic*
  - ○ Annapoorna Prabhu (Electrical and Computer Engineering, Purdue University 2024)   2022 Aug. –
    - — Annapoorna received the Best Oral Presentation award for her presentation at
      the 2023 Purdue Summer Undergraduate Research Symposium
  - ○ Caroline Henson (Computer Engineering, Purdue University 2025)   2022 Jan. – Aug.
  - ○ Abhiram Nambiar (First-year Engineering, Purdue University 2025)   2022 Jan. – Apr.
- *Quantitative analysis of meristem development in ferns*
  - ○ Simran Kadadi (Computer Science, Purdue University 2023)   2022 Sep. – Dec.
- *Forecasting U.S. elections with compartmental models*
  - ○ Mengqi Liu (Computer Engineering, Purdue University 2023; Next: Software   2022 May – Dec.
    Developer, Lenovo)
  - ○ Manas Paranjape (Computer Science, Purdue University 2025)   2022 Feb. – Aug.
  - ○ Ryan Branstetter (Mathematics, Purdue University 2023; Next: MS Student,   2022 Jan. – 2023 May
    Mathematics, University of Texas Rio Grande Valley)

- ○ William He (Northwestern University 2023) — 2020 Apr. – Dec.
- ○ Christopher Lee (Northwestern University 2023) — 2020 Apr. – 2021 Apr.
- ○ Samuel Chian (Next: MS Student, Comp. and Math. Eng. Stanford University) — 2020 Jun. – Dec.
  - — Christopher and Will received the Audience Choice award for their virtual poster video at the 2020 NU Undergraduate Research & Arts Expo.
- *Topological data analysis of on- and off-lattice models* (with B Sandstede)
  - ○ Electa Cleveland (Brown University 2023) — 2021 Jun. – 2022 May
  - ○ Angela Zhu (Brown University 2024) — 2021 Jun. – 2022 May
- *Mathematical methods to analyze state–state relationships* — 2020, 2021 Summ.
  - ○ Brian Hsu (Next: MS Student, Statistics, Northwestern University)
    - — Brian received an NU Undergraduate Research Grant and was selected as a finalist for the Fletcher URG Prize for outstanding summer research.
- *Investigating the accuracy of election forecasts in time*
  - ○ Emily Mansell (Northwestern University 2023) — 2021 Jan. – May
- *Machine-learning methods to extract pigment cells from fish-pattern images*
  - ○ Harita Duggirala (Northwestern University 2024) — 2021 Jan. – May
- *Image-processing methods for measuring pigment cells in zebrafish patterns* — 2020 Summ.
  - ○ Olivia Dunne (University of Chicago 2022)
- *Analyzing patterns in a cellular automaton model using TDA* (with B Sandstede) — 2020 Summ.
  - ○ Nathan Elbaum (Brown University 2021)
  - ○ Samuel Maffa (Brown University 2022)
- *Modeling stripe formation across the body and fins of zebrafish* (with B Sandstede) — 2019 Summ.
  - ○ Addie Harrison (Next: PhD Student, Mathematics, University of Arizona)
  - ○ Gisela Hoxha (Brown University 2021)
  - ○ Gil Parnon (Next: Junior Modeling Engineer, Kforce Inc.)
    - — Gil was selected as a finalist for the 2019 NSF–Simons Center Prize for Undergraduate Research in Quantitative Biology.
  - ○ Madison Russell (Next: PhD Student, Mathematics, University at Buffalo)
  - ○ Berke Türkay (Brown University 2021)
- *Modeling stripe formation on the tailfins of zebrafish* (with B Sandstede) — 2016 Summ.
  - ○ Madeline Abbott (Next: MS Student, Biostatistics, University of Michigan)
  - ○ Neil Chandra (Next: Software Engineer, Facebook)
  - ○ Bethany Dubois (Next: Scientific Associate, D.E. Shaw Research)
  - ○ Francesca Lim (Next: Data Science Intern, Citizens Bank)
  - ○ Dorothy Sexton (Next: Economic Analyst Intern, Emsi)
- *Stability analysis of agent-based models using PDMPs* (with MV Ciocanel, B Sandstede) — 2016 Summ.
  - ○ Cassandra Cole (Brown University 2018)
  - ○ Philip Doldo (Next: PhD Student, Applied Mathematics, Cornell University)
  - ○ Claire Qing Fan (Next: PhD Student, Public Policy, University of Chicago)
    - — Claire, Cassie and Philip received an Outstanding Poster Award for their research at the JMM Undergraduate Poster Session in 2017 Jan.
- *Independent study on zebrafish fins* (with B Sandstede) — 2015 Fall
  - ○ Emily Briggs (Brown University)
- *Network construction from diary-based data* (with MV Ciocanel, B Sandstede) — 2015 Summ.
  - ○ Joshua Rubin Abrams (Next: PhD Student, Mathematics, University of Arizona)
  - ○ Anne Schwartz (Next: Software Development Engineer, Amazon)

Inclusion & Mentorship Training:

2018	Diversity and Implicit Bias Awareness Certificate, Ohio State University
2014 – 2016	Sheridan Center Certificate V: Academic Advising Track, Brown University
2014 – 2015	TEAM Collective (advice for advisors of underrepresented students), Brown University

Service (Field):

- *Program Director*
  - SIAM Activity Group on Dynamical Systems — 2024 – 2026
    — Co-chair of the 2025 SIAM Conference on Applications of Dynamical Systems
- *Workshop Co-organizer*
  - ICERM Topical Workshop on Patterns, Dynamics, and Data in Complex Systems (with P Carter, MV Ciocanel, S Dodson, and A Ghazaryan) — 2025 TBD
  - AWM Workshop on Complex & Nonlinear Systems, SIAM Annual Meeting (with HZ Brooks and N Rodríguez) — 2024 Jul.
  - AMS Math Research Community: Mathematics of Complex Social Systems (with HZ Brooks, M Feng, MA Porter) — 2023 Jun.
    — AMS MRC programs include travel funding and local support for about 40 participants
  - BIRS Workshop: Building Networks: Women in Complex & Nonlinear Systems (with HZ Brooks, NH Fefferman, N Rodríguez) — 2022 Sep.
  - AMS Math Research Community: Agent-Based Modeling in Biological & Social Systems (with AJ Bernoff, MR D'Orsogna, AE Lindsay, C Topaz, L Ziegelmeier) — 2018 Jun.
  - Workshop on Agent-Based Modeling, Brown University (with MV Ciocanel, J Gemmer) — 2015 Mar.
- *Short-course Lead-organizer* (over 300 participants)
  - AMS Short Course: Mathematical & Computational Methods for Complex Social Systems, prior to the Joint Mathematics Meetings (with HZ Brooks, M Feng, MA Porter) — 2021 Jan.
- *Chair*
  - Subgroup on Cell and Developmental Biology, Society for Mathematical Biology — 2022 Oct. –
  - Travel Grant Selection Committee, Association for Women in Mathematics — 2022 Feb. –
- *Committee Member*
  - Scientific Committee for Math. Modeling, Diff. Eqns., Numerics, and Simulation, Karlsruhe Institute of Technology MathSEE Symposium — 2023 Jan. – Sept.
  - Organizing Committee, SIAM Conference on Applications of Dynamical Systems — 2022 Feb. – 2023 May
  - AWM–SIAM Committee (topic: AWM activities at the SIAM Annual Meeting) — 2022 Oct.–
    — AWM–SIAM Committee Poster Judging Coordinator — 2024 Feb. – 2025 Jan.
- *Editorial Board Member*
  - Physica D, Early Career Editorial Board — 2022 Mar. –
  - SIAM DSWeb (SIAM's online dynamical systems magazine) Media Gallery Editor — 2022 Feb. –
- *Guest Editor*
  - "Mathematical and computational methods for complex social systems", volume of the AMS Proc. of Symposia in Applied Mathematics (with HZ Brooks, M Feng, MA Porter) — In prep
- *Minisymposium Organizer/Co-organizer*
  - "Modeling complex systems across scales in cell and developmental biology", SMB Annual Meeting (with Y Jiang, WD Martinson, B Peercy) — *In review*
  - "Topological data analysis" (invited session), Equadiff (with D Cruz, S Tymochko) — 2024 Jun.
  - "Data-driven, modeling, and topological techniques in cell and developmental biology", SMB Annual Meeting (with A Buttenschön, MV Ciocanel) — 2023 Jul.
  - "Modeling and data-driven methods for collective behavior and pattern formation", SIAM — 2023 May

Conf. on Applications of Dynamical Systems (with K Ha)

- ○ "Modeling collective behavior in biology", Joint Mathematics Meetings (with P Maini) — 2023 Jan.
- ○ "Combining topological, data-driven, and modeling perspectives for complex biological systems", SIAM Conf. on the Life Sciences (with MV Ciocanel, J Nardini) — 2022 Jul.
- ○ "Mathematics of complex systems", Joint Mathematics Meetings (with HZ Brooks, AP Hoover, MA Porter, AC Schwarze) — 2022 Apr.
- ○ "Mathematics of complex systems in biology", AMS Spr. Central Sect. Meeting (with N Wei) — 2022 Mar.
- ○ "Modeling opinion dynamics in complex social systems", SIAM Conf. on Applications of Dynamical Systems (with JD Johnson) — 2021 May
- ○ "Agent-based dynamics and self-organization in biology", Joint Mathematics Meetings (with AJ Bernoff, J Weinburd) — 2021 Jan.
- ○ "Data-driven methods and modeling with applications to health science", virtual SIAM Conf. on Mathematics of Data Science (with Y Chen) — 2020 May
- ○ "Dynamics of democracy", SIAM Conf. on Applications of Dynamical Systems (with HZ Brooks) — 2019 May
- ○ "Agent-based modeling in the life sciences", SIAM Conf. on the Life Sciences (with AJ Bernoff, MR D'Orsogna, AE Lindsay) — 2018 Aug.
- ○ "Analytical & computational advances in mathematical biology across scales", AMS Spring Central Sectional Meeting (with MV Ciocanel) — 2018 Mar.
- ○ "PDEs arising from the self-organization of agents", SIAM Conf. on Analysis of PDEs — 2017 Dec.
- ○ "Stripe formation on zebrafish: a collection of biological & mathematical perspectives", SIAM Conf. on the Life Sciences — 2016 Jul.
- ○ "Differential equations, probability, and sea ice", Joint Mathematics Meetings (with BC Barry, K Hill, R Lieb-Lappen, C Sampson) — 2016 Jan.
- ○ "The behavior of autonomous agents in diverse applications", SIAM Conf. on Applications of Dynamical Systems (with P Carter) — 2015 May

- *Minitutorial Co-organizer*
  - ○ "Data-driven mathematical modeling", SIAM Conf. on the Life Sciences (with J Nardini, E Rutter) — 2022 Jul.

- *Conference Mentorship/Community-Building Session Co-organizer*
  - ○ "Icebreaker session", SIAM Conf. on Applications of Dynamical Systems (with CM Topaz) — 2023 May
  - ○ "Mentoring session", SIAM Conf. on Applications of Dynamical Systems (with K Burke, C Postlethwaite, M Silber) — 2021 May
  - ○ "Student & postdoc icebreaker", SIAM Conf. on Applications of Dynamical Systems (with HZ Brooks) — 2019 May

- *Invited Panelist*
  - ○ Panel on Interdisc. Math. Research: Challenges & Opportunities, Karlsruhe Institute of Technology MathSEE Symposium, Karlsruhe, Germany — 2023 Sep.
  - ○ Isaac Newton Institute Workshop Session for Early Career Researchers, Cambridge, UK — 2023 Sep.
  - ○ Intl. Center for Journalists Pamela Howard Forum on Global Crisis Reporting (math focus) — 2023 Jul.
  - ○ Panel on Careers in Academia, SAMSI Workshop on Data-Driven Math. & Stat. Modeling — 2021 Jul.

- *Poster Session Judge*
  - ○ MathSEE Symposium Poster Session, Karlsruhe, Germany — 2023 Sep.
  - ○ Cell and Developmental Biology Poster Session, SMB Annual Meeting — 2023 Jul.
  - ○ Red Sock Award Poster Session, SIAM Conf. on Applications of Dyn. Systems — 2019 May, 2023 May
  - ○ ePoster Session, SMB Annual Meeting — 2021 Jun.
  - ○ Methods for Biological Modeling ePoster Session, SMB Annual Meeting — 2020 Aug.
  - ○ MAA Undergraduate Student Poster Session, Joint Mathematics Meetings — 2019 Jan.

- *Grant Proposal Reviewer*   2021 –
  - Austrian Science Fund
  - National Science Foundation Division of Integrative Organismal Systems (ad hoc)
  - Army Research Office
  - Banff International Research Station
- *Referee*   2018 –
  - SIAM Journal on Applied Dynamical Systems
  - SIAM Journal on Applied Mathematics
  - Journal of Mathematical Biology
  - Discrete & Continuous Dyn. Systems B
  - Mathematical Biosciences
  - IMA Journal of Applied Mathematics
  - PLOS One
  - Royal Society Open Science
  - Journal of the Royal Society Interface
  - Bioinformatics
  - SIAM Review
  - Bulletin of Mathematical Biology
  - Mathematical Biosciences and Engineering
  - Chaos
  - Science
  - PNAS
  - Science Advances
  - MN Journal of Undergraduate Math.
  - Zebrafish
  - Symmetry
  - PLOS Computational Biology
  - Physica D
  - Proceedings A
  - Proceedings B
  - Adv. in Cont. & Discrete Models: Theory & Appl.
  - Journal of Nonlinear Science
  - Journal of Statistical Mechanics: Theory & Exp.
- *Mentor*
  - SMB Cell and Developmental Biology Mock Academic Interview Program (**2** mentees)   2023 Dec.
  - AWM Mentor Network (**2** mentees)   2023 Oct. –
  - Society for Mathematical Biology Annual Meeting mentoring program (**2** mentees)   2023 Jul.
  - SIAM Conf. on Applications of Dynamical Systems mentoring session   2023 May
  - National Math Alliance pre-doctoral mentoring program   2021 Nov. –
  - Society of Hispanic Prof. Engineers National Conference writing-review program (**1** mentee)   2021 Nov.
  - Society for Mathematical Biology Annual Meeting mentoring program (**1** mentee)   2021 Jun.
  - SACNAS National Diversity in STEM mentoring program (**2** mentees)   2020 Oct.
  - Society for Mathematical Biology Annual Meeting mentoring program (**2** mentees)   2020 Aug.
  - European Conf. on Mathematical & Theoretical Biology mentoring program (**2** mentees)   2018 Jul.
- *Media Co-Chair*
  - Methods for Biological Modeling Subgroup, Society for Mathematical Biology   2020 Aug. –
- *Session Chair*
  - Virtual MBI Workshop on Mathematical & Computational Methods in Biology   2020 May

Service (University):

- *Interviewer*
  - PULSe Graduate Program Applicant Interviews, Purdue University   2023 Dec.
- *Speaker*
  - Women in Science Program (presentation on preparing for conferences), Purdue University   2022 Oct.
- *Mentor*
  - Emerging Leaders Science Scholars (**1** undergraduate student), Purdue University   2022 Sep. –
- *Exam Writer and Grader*
  - Laplace transform problems for Mechanical Engineering Qualifying Exam, Purdue University   2024 Jan.
- *Judge/Reviewer*
  - EURO Summer Undergraduate Research Fellowship Symposium (talks), Purdue University   2022 Jul.

- ○ Undergraduate Research Conference (posters), Purdue University — 2022 Apr.
- ○ Undergraduate Research and Arts Exposition (virtual posters), Northwestern University — 2020 May
- ○ Hayes Graduate Research Forum (abstracts), Ohio State University — 2018 Dec.
- ○ PDA Travel Award Applications, Ohio State University — 2018 Dec.
- ○ Denman Undergraduate Research Forum (posters), Ohio State University — 2018 Apr.
- ○ Natural & Math. Sciences Undergraduate Research Forum (posters), Ohio State University — 2018 Mar.
- ○ Hack Ohi/o Hackathon (projects), Ohio State University — 2017 Oct.
- ○ Undergraduate Research Fall Forum (posters), Ohio State University — 2017 Sep.
- *Committee Member*
  - ○ NSF–Simons Center for Quant. Biology Leadership Council, Northwestern University — 2019 – 2021
  - ○ Honorary Degree Committee, Brown University — 2015 – 2017
  - ○ Department of Public Safety Oversight Committee, Brown University — 2015 – 2017
  - ○ Graduate Student Council Finance Board, Brown University — 2015 – 2016
  - ○ Graduate Student Council (representative for applied mathematics), Brown University — 2014 – 2016
  - ○ Promotion and Tenure Committee (undergraduate student representative), UMBC — 2008, 2010
- *Academic Advisor*
  - ○ Primary Faculty Academic Advisor (**4** undergraduate students), Brown University — 2014 – 2016

Service (Department):

- *Faculty Advisor*
  - ○ AWM Chapter, Purdue University — 2023 Jul. –
- *Graduate Academic Advisor*
  - ○ Ph.D. student Tianna Burke, Mathematics, Purdue University — 2022 Aug. –
  - ○ Ph.D. student Jax Mader, Mathematics, Purdue University — 2022 Aug. –
- *Committee Member*
  - ○ Mathematics Undergraduate Scholarship Committee, Purdue University — 2023 Sep. –
- *Speaker*
  - ○ Mathematics Society Faculty Talk (undergraduate math club), Purdue University — 2022 Mar., 2023 Feb.
  - ○ Basic Skills Workshop (presentation on building an online presence), Purdue University — 2021 Oct.
  - ○ Quant. Biology Dialogue, Summer Undergraduate Research Program, Northwestern — 2020 Aug.
  - ○ Science on Social Media, Summer Undergraduate Research Program, Northwestern — 2020, 2021 Jul.
  - ○ LaTeX Tutorial, MBI Mathematical Biosciences Bootcamp, Ohio State University — 2019 Jun.
  - ○ Math Biology Group, Applied Math Graduate Student Retreat, Brown University — 2016 Sep.
- *Mentor*
  - ○ Math Graduate Student Mentoring Program (Bhakti Vyas), Purdue University — 2022 Aug. –
  - ○ Student Teams in COMAP Mathematical Contest in Modeling, Purdue University — 2022 Feb., 2023 Feb.
  - ○ Applied Math Grad–Undergrad Mentoring Program (**4** students), Brown University — 2016 – 2017
  - ○ Applied Math Academic Buddy Program (**1** incoming Ph.D. student), Brown University — 2014
- *Panelist*
  - ○ Summer Math Camp "Ask a mathematician" Panel (precalculus group), Purdue University — 2023 Jul.
  - ○ Career Path Panel, MBI Mathematical Biosciences Bootcamp, Ohio State University — 2019 Jun.
  - ○ MBI Panel for Sampling Advanced Math for Minority Students, Ohio State University — 2017 Jul.
  - ○ Panel on REUs, AWM, Brown University — 2016 Oct.
  - ○ Graduate School Panel, AWM & Rose Whelan Society, Brown University — 2016 Mar.
- *Graduate Recruitment Volunteer*
  - ○ Department of Mathematics Recruitment Day, Purdue University — 2022 Mar., 2023 Mar.
  - ○ PULSe Interdisciplinary Life Science Graduate Recruitment Events, Purdue University — 2022 Mar.

- *Organizer/Co-organizer*
  - CQuB Panel: Applying for Postdoc & Tenure-Track Positions, Northwestern University — 2021 Apr.
  - ESAM Departmental Social Game Hour (virtual), Northwestern University — 2020 Spring, Fall
  - Postdoc Panel, Brown University — 2015 May
  - Alumni Panel: Jobs in Academia & Industry, Brown University — 2015 Sep.
  - Multiple events for the Rose Whelan Society for Women in Math, Brown University — 2013 – 2017
  - Bi-annual final exam prep sessions for applied math courses, Brown University — 2013 – 2016
- *Judge/Reviewer*
  - NSF–Simons Center for Quant. Biology Pilot Projects, Northwestern University — 2020, 2021 Spring
  - Undergraduate Poster Session, NSF–Simons Conference on Quant. Approaches in Biology — 2020 Nov.
  - Mathematical Contest for Modeling, Ohio State University — 2017 – 2019
  - Brown Mathematical Contest for Modeling, Brown University — 2015, 2016
- *President & Lead Founder*
  - SIAM Student Chapter, Brown University — 2015 – 2016
    - Co-organized 10 events and grew chapter to over 100 members spanning 8 disciplines
- *Secretary*
  - SIAM Student Chapter, Brown University — 2016 – 2017
  - AWM Student Chapter, Brown University — 2013 – 2014

Outreach (Math-Engagement & Public-Science Talks):

- *On zebrafish patterns and math biology (for a high-school audience)*
  - California State Summer School For Math & Science at UC Davis, Cyberspace — 2021 Jul.
- *On election forecasting and my scientific story*
  - Interview in the 2Scientists podcast[1] — 2020 Oct.
- *On U.S. election forecasting and complex systems*
  - Levy Senior Citizen Center, Cyberspace — 2020 Oct.
- *On zebrafish patterns and applied math (for an elementary-school audience)*
  - Washington Elementary School (3rd grade computer-coding class), Evanston, IL — 2020 Feb.
  - Washington Elementary School (2nd grade computer-coding class), Evanston, IL — 2020 Feb.
  - Pheasant Run Boys & Girls Club (after school program), Reynoldsburg, OH — 2018 Dec.
  - Gables Elementary School (Boys & Girls Club summer program), Columbus, OH — 2018 Jul.
  - Oakmont Elementary School (Boys & Girls Club summer program), Columbus, OH — 2018 Jul.
  - Livingston Elementary School (Boys & Girls Club summer program), Columbus, OH — 2018 Jul.
- *On stability analysis (for an elementary- or middle-school audience)*
  - JHU Center for Talented Youth program, Providence, RI — 2016 Dec.
  - Jewish Community Day School (5th grade class), Providence, RI — 2016 Feb.
- *On intracellular transport and random walks (for a high-school audience)*
  - Young Women's Summer Institute (students and teachers), Columbus, OH — 2018 Jul.
- *On fish patterns and self-organization*
  - Levy Senior Citizen Center, Evanston, IL — 2019 Dec.
  - STEAM Factory, Columbus, OH — 2018 Mar.

Other Outreach:

- *Panelist/Speaker*
  - Frontiers for Young Minds Zone (virtual chats with students about expository article [4]) — 2023 Jun.

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[1] Preliminary recording: `https://www.youtube.com/watch?v=V8UW3uGrdiU`

- ○ AWM mentoring program at Wake Forest University, Cyberspace .... 2020 Oct.
- ○ K–12 classrooms (2 classes), SkypeAScientist Outreach Program, Cyberspace .... 2019 Oct.
- ○ Young Women's Summer Institute Career Night (6th–7th grade girls), Columbus, OH .... 2018 Jul.
- *Judge*
  - ○ AWM Essay Contest: Biographies of Contemporary Women in Mathematics .... 2016 – 2018, 2020
  - ○ Ohio Supercomputer Center SUG Conference (posters), Columbus, OH .... 2019 Apr.
  - ○ High School I/O Hackathon (projects), Columbus, OH .... 2019 Mar.
- *Interviewee*
  - ○ AWM Essay Contest: Biographies of Contemporary Women in Math (college category) .... 2020 Jan.
- *Exhibit Presenter*
  - ○ Evanston Twp. High School, Scientific Image & Student Art Exhibit, Evanston, IL .... 2019 Dec.
- *Group Leader/Mentor/Volunteer*
  - ○ Expanding Your Horizons Conference (6th–8th grade girls), Evanston, IL .... 2019 Dec.
  - ○ Metro High School Coding Club, Columbus, OH .... 2018 Sep.
  - ○ Johnnycake Elementary School, Baltimore, MD .... 2008 – 2009
- *Member*
  - ○ 500 Women Scientists Gage directory .... 2020 –
  - ○ STEAM Factory, Ohio State University .... 2018 – 2019
  - ○ Math CoOp Outreach Program (founding member), Brown University .... 2014 – 2017
  - ○ NSF Graduate Research Fellowship Program Experienced Resource Person List .... 2011 –

Invited Workshop Participation:

2024 Jun.	BIRS–IMAG Workshop on Evolution to Bioeng. of Biol. Patterning Mechanisms, Granada, Spain
2024 Apr.	NSF–Simons Natl. Institute for Theory & Math. in Bio. Annual Meeting, New York, New York
2023 Sep.	Isaac Newton Institute Workshop on Measures & Representations of Interactions, Cambridge, UK
2023 Aug.	Isaac Newton Institute Workshop on Collective Behaviour, Cambridge, UK
2023 Jul.	Workshop on Neurosc., Coll. Migration & Parameter Est., University of Oxford, Oxford, UK
2023 Apr.	Simons Foundation MathBioSys Annual Meeting, Cyberspace
2022 May	BIRS Workshop on Emergent Collective Behaviors: Simulation & Experiment, Banff, Alberta
2022 Apr.	Simons Foundation MathBioSys Annual Meeting, Cyberspace
2021 Dec.	ICERM Workshop on Geometric and Topological Methods in Data Science, Cyberspace
2021 Oct.	BIRS Math of the Cell Workshop: Integrating Signaling, Transport, & Mechanics, Cyberspace
2021 Oct.	Broadening Participation: 2021 MPS Workshop for Young Investigators, Cyberspace
2020 May	MBI Workshop on Mathematical & Computational Methods in Biology, Cyberspace
2019 Aug.	ICERM Workshop on Applied Math. Modeling with Topological Techniques, Providence, RI
2019 Jun.	BIRS Worksop on Bridging Cell. & Tissue Dyn. from Normal Dev. to Cancer, Banff, Alberta
2019 May	NIMBioS/DySoC Investigative Workshop: Mathematics of Gun Violence, Knoxville, TN
2019 Apr.	Rising Stars Workshop for Women in Computational & Data Science, Austin, TX
2018 Oct.	Program on Mathematical Biology, Institut Mittag-Leffler, Djursholm, Sweden
2018 Sep.	Workshop on Diff. Eqns. arising from Organizing Principles in Biology, Oberwolfach, Germany
2018 Aug.	BIRS Math of the Cell Workshop: Mech. & Chem. Signaling across Scales, Banff, Alberta
2017 Aug.	ICERM Workshop on Pedestrian Dynamics, Providence, RI
2015 Jun.	AMS Math Research Community on Sea Ice, Diff. Equations, & Probability, Snowbird, UT
2013 Sep.	IMA Research Collaboration for Women in Applied Math & Dyn. Systems, Minneapolis, MN

Tech. Skills: MATLAB, HTML, CSS, AUTO (numerical continuation)

Memberships:

- Society for Industrial & Applied Mathematics (SIAM)
- Association for Women in Mathematics (AWM)
- American Mathematical Society (AMS)
- Society for Advancement of Chicanos/Hispanics & Native Americans in Science (SACNAS)
- Society for Mathematical Biology (SMB)
- National Association of Mathematicians (NAM)
- American Physical Society (APS)