

Alexandria Volkening

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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
	<ul style="list-style-type: none">• Department of Mathematics• Weldon School of Biomedical Engineering (by courtesy)	
2019 Jul. – 2021 Aug.	NSF–Simons Fellow	Northwestern University
	<ul style="list-style-type: none">• NSF–Simons Center for Quantitative Biology (CQuB)• Engineering Sciences & Applied Mathematics (ESAM)	
2017 Jun. – 2019 Jul.	Postdoctoral Fellow	Ohio State University
	<ul style="list-style-type: none">• Mathematical Biosciences Institute (MBI)	

Education:

2017 May	Ph.D., Applied Mathematics	Brown University
	<ul style="list-style-type: none">• Advisor: Björn Sandstede• Thesis: Modeling pattern formation on zebrafish	
2012 May	M.S., Applied Mathematics	Brown University
2011 May	B.S., Mathematics	UMBC
	<ul style="list-style-type: none">• <i>Summa cum laude</i>, Honors in math, Meyerhoff Scholar Affiliate	

Publications:

- [9] K Mallory, J Abrams[†], A Schwartz[†], MV 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.

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

- [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:

- 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.
- **A Volkening**, B Sandstede. “How zebrafish get their stripes... or spots”, *SIAM News*, 53(2), 2020.
- **A Volkening**. “How the zebrafish got its stripes”, *The Conversation*, 17 September, 2018.

Preprints:

- B Shirman[‡], **A Volkening**. “What’s math got to do with patterns on fish?”, <http://alexandriavolkening.com/ShirmanVolkeningPreprint.pdf>, (target: *Frontiers for Young Minds*), 2020.

Articles in Preparation:

- “A survey of approaches to quantitatively describing agent-based patterns”
- “How does student-entry time depend on lecture-hall size?” (with J Benson, M Bessonov, K Burke, S Cassani, D Cooney, MV Ciocanel)

Press Coverage & Cover Articles:

- | | |
|--------|---|
| 2020 | Publication [8] featured as a SIAM research nugget |
| 2020 | Publication [8] described in an article in <i>Forbes</i> |
| 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 <i>Journal of the Royal Society Interface</i> , 12(113) |

Selected Awards:

- | | |
|------|---|
| 2021 | Fletcher Prize for Excellence in Research Mentorship, Northwestern University <ul style="list-style-type: none"> ◦ Based on nominations by my undergraduate student researchers |
| 2019 | Finalist, Capturing the Beauty of Science: Scientific Image Contest, Northwestern University <ul style="list-style-type: none"> ◦ 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	Premier Scholarship (full tuition, room, and board), UMBC

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

- *NU 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
- *Collaborate@ICERM Award*
 - Collaborative proposal “Mathematical models of pedestrian movement in large lecture halls” 2021 Jun.
- *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*
 - \$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.

Invited Talks:

- *On modeling or analysis of pattern formation in zebrafish*
 - New York University Computational Biology and Medicine Colloquium, Cyberspace 2022 Mar.
 - Caltech Computational Mathematics + X Seminar, Cyberspace 2022 Jan.
 - Special session, Joint Mathematics Meetings, Seattle, WA 2022 Jan.
 - University of Melbourne Mathematical Biology Seminar, Cyberspace 2021 Oct.
 - Institute of Mathematics of Toulouse (France) Mathematical Biology Seminar, Cyberspace 2021 Sep.
 - 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.
 - 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.

- University of British Columbia Mathematical Biology Seminar, Cyberspace 2020 Sep.
- Keynote, Lorentz Center Summer School: Modeling Shape & Size in Biol. Dev., Cyberspace 2020 Aug.
- Minisymposium, SIAM Conf. on the Life Sciences, Golden Grove, CA (conference postponed) 2020 Jun.
- Special Seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany 2020 Jan.
- University of Notre Dame Applied Math Seminar, Notre Dame, IN 2019 Sep.
- 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.
- New Frontiers in Pattern Formation Workshop, Cardiff, UK (virtual) 2018 Dec.
- Special Seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany 2018 Oct.
- Leiden University Informal Analysis Seminar, Leiden, Netherlands 2018 Oct.
- 1010 Workshop on Mathematical Biology, Instiut Mittag-Leffler, Djursholm, Sweden 2018 Oct.
- Minisymposium, SIAM Conf. on the Life Sciences, Minneapolis, MN 2018 Aug.
- Minisymposium, European Conf. on Mathematical & Theoretical Biology, Lisbon, Portugal 2018 Jul.
- 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.
- Minisymposium, SIAM Conf. on Analysis of PDEs, Baltimore, MD 2017 Dec.
- College of Wooster Bio/Physics Colloquium, Wooster, OH 2017 Oct.
- Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT 2017 May
- 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.
- 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
- Special Seminar, Max Planck Institute for Developmental Biology, Tübingen, Germany 2015 Apr.
- Minisymposium, SIAM Conf. on Nonlinear Waves & Coherent Structures, Cambridge, UK 2014 Aug.
- *On topological techniques for quantifying zebrafish and other cell-based patterns*
- POSTECH (Korea) MINDS Seminar, Cyberspace 2021 Nov.
- Special session, AMS Fall Southeastern Sectional Meeting, Mobile, AL 2021 Nov.
- Mathematical Biosciences Institute REU Seminar Series, Cyberspace 2021 Jun.
- Minisymposium, Society for Mathematical Biology Annual Meeting, Cyberspace 2021 Jun.
- Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Cyberspace 2021 May
- University of Birmingham Applied Mathematics Seminar, Cyberspace 2021 Mar.
- Special session, Joint Mathematics Meetings, Cyberspace 2021 Jan.
- Southeast Center for Mathematics and Biology Annual Symposium, Cyberspace 2020 Dec.
- University of Pennsylvania Mathematical Biology Seminar, Cyberspace 2020 Oct.
- Duke University Mathematical Biology Seminar, Cyberspace 2020 Sep.
- Minisymposium, SMB/ESMTB Annual Meeting, Cyberspace 2020 Aug.
- Minisymposium, SIAM/CAIMS Annual Meeting, Cyberspace 2020 Jul.
- Mathematical Biosciences Institute REU Seminar Series, Cyberspace 2020 Jun.
- Minisymposium, SIAM Conf. on Mathematics of Data Science, Cyberspace 2020 May
- Ohio State University Applied Math Seminar, Columbus, OH 2020 Jan.
- BIRS Workshop: Bridging Cell. & Tissue Dyn. from Normal Dev. to Cancer, Banff, Alberta¹ 2019 Jun.

¹Recording: <http://www.birs.ca/events/2019/5-day-workshops/19w5080/videos/watch/201906190901-Volkening.html>

- *On election forecasting with compartmental models*
 - PIMS/University of British Columbia Rising Stars Colloquium, Cyberspace 2020 Oct.
 - UC Davis Mathematical Biology Seminar, Cyberspace 2020 Oct.
 - Williams College Data Science Bootcamp, Cyberspace 2020 Jan.
 - University of Minnesota Dynamical Systems Seminar, Minneapolis, MN 2019 Oct.
 - Minisymposium, SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT 2019 May
 - Case Western Reserve University Applied Math Seminar, Cleveland, OH 2019 Mar.
 - MBI Workshop on Modeling & Analysis of Dynamic Social Networks, Columbus, OH 2018 Oct.
 - Seminar, Ohio Wesleyan University, Delaware, OH 2018 Sep.
- *On zebrafish patterns, with a focus on modeling and public-science outreach*
 - UC Riverside Interdisc. Center for Quant. Modeling in Biology/AWM Seminar, Cyberspace 2020 Nov.
- *On modeling self-organization*
 - MBI Workshop on Mathematical & Computational Methods in Biology, Cyberspace² 2020 May
 - Special session, Joint Mathematics Meetings, Baltimore, MD 2019 Jan.
 - Ohio Wesleyan University Science Lecture Series, Delaware, OH 2018 Sep.
- *On other topics in mathematical biology*
 - BIRS Workshop: Mathematics of the Cell, Banff, Alberta 2018 Aug.
 - Special session, AMS Spring Central Sectional Meeting, Columbus, OH 2018 Mar.

Other Local Seminar Talks:

- *At Purdue University*
 - 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

²Recording: <https://video.mbi.ohio-state.edu/video/player/?id=4909>

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

University Talks:

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

Teaching Experience:

- *Instructor of Record*

◦ Ordinary Differential Equations (MA 26600), Purdue University	2021 Fall
◦ Projects Special (research course; see next session), 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) ³	
◦ 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 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*

³Lecture: <https://northwestern.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=7d04a874-a292-4ff2-bd66-ac2500daeea1>

- 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

Postbac Student Research Supervision (1 student):

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

Undergraduate Student Research Supervision (25 students):

- *Mathematical methods to analyze state–state relationships* 2020, 2021 Summ.
 - Brian Hsu (Northwestern University 2021)
 - 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
- *Forecasting U.S. elections with compartmental models*
 - Christopher Lee (Northwestern University 2023) 2020 Apr. – 2021 Apr.
 - Samuel Chian (Northwestern University 2023) 2020 Jun. – Dec.
 - William He (Northwestern University 2023) 2020 Apr. – Dec.
 - Christopher and Will received the Audience Choice award for their virtual poster video at the 2020 NU Undergraduate Research & Arts Expo.
- *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 (Current: PhD Student, Mathematics, University of Arizona)
 - Gisela Hoxha (Brown University 2021)
 - Gil Parnon (Current: PhD Student, Mathematics, Oregon State University)
 - Gil was selected as a finalist for the 2019 NSF–Simons Center Prize for Undergraduate Research in Quantitative Biology.
 - Madison Russell (Current: 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 (Current: MS Student, Biostatistics, University of Michigan)
 - Neil Chandra (Current: Software Engineer, Facebook)
 - Bethany Dubois (Current: Scientific Associate, D.E. Shaw Research)
 - Francesca Lim (Current: Data Science Intern, Citizens Bank)
 - Dorothy Sexton (Current: 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 (Current: PhD Student, Applied Mathematics, Cornell University)
- Claire Qing Fan (Current: 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 (Current: PhD Student, Mathematics, University of Arizona)
 - Anne Schwartz (Current: Software Development Engineer, Amazon)

Education/Mentoring 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):

- *Workshop Co-organizer*
 - 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*
 - 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.
- *Minisymposium Organizer/Co-organizer*
 - “Mathematics of complex systems”, Joint Mathematics Meetings (with HZ Brooks, AP Hoover, MA Porter, and AC Schwarze) 2022 Jan.
 - “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

- *Conference Mentorship/Community-Building Session Co-organizer*
 - “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
- *Panelist*
 - Panel on Careers in Academia, SAMSI Workshop on Data-Driven Math. & Stat. Modeling 2021 Jul.
- *Poster Session Judge*
 - ePoster Session, SMB Annual Meeting 2021 Jun.
 - Methods for Biological Modeling ePoster Session, SMB Annual Meeting 2020 Aug.
 - Red Sock Award Poster Sessions, SIAM Conf. on Applications of Dynamical Systems 2019 May
 - MAA Undergraduate Student Poster Session, Joint Mathematics Meetings 2019 Jan.
- *Referee* 2018 –
 - SIAM Journal on Applied Dynamical Systems ◦ Science
 - SIAM Journal on Applied Mathematics ◦ Science Advances
 - Journal of Mathematical Biology ◦ Royal Society Open Science
 - Discrete & Continuous Dyn. Systems B ◦ MN Journal of Undergraduate Math.
 - Mathematical Biosciences ◦ Zebrafish
 - IMA Journal of Applied Mathematics ◦ Symmetry
 - PLOS One ◦ PLOS Computational Biology
- *Mentor*
 - Society for Mathematical Biology Annual Meeting mentoring program (1 student) 2021 Jun.
 - SACNAS National Diversity in STEM mentoring program (2 students) 2020 Oct.
 - Society for Mathematical Biology Annual Meeting mentoring program (2 students) 2020 Aug.
 - European Conf. on Mathematical & Theoretical Biology mentoring program (2 students) 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):

- *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
- *Judge/Reviewer*
 - 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.
- *Academic Advisor*
 - Primary Faculty Academic Advisor (4 students), Brown University 2014 – 2016

Service (Department):

- *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

- *Presenter/Group Leader*

- Quant. Biology Dialogue, Summer Undergraduate Research Program, Northwestern 2020 Aug.
- Science on Social Media, Summer Undergraduate Research Program, Northwestern 2020, 2021 Jul.
- L^AT_EX Tutorial, MBI Mathematical Biosciences Bootcamp, Ohio State University 2019 Jun.
- Math Biology Group, Applied Math Graduate Student Retreat, Brown University 2016 Sep.

- *Mentor*

- Applied Math Grad–Undergrad Mentoring Program (4 students), Brown University 2016 – 2017

- *Panelist*

- 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.

- *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 podcast⁴ 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.

⁴Preliminary recording: <https://www.youtube.com/watch?v=V8UW3uGrdiU>

- *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:

- *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.
- *Panelist/Speaker*
 - 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.
- *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:

2021 Oct.	BIRS Math of the Cell Workshop: Integrating Signaling, Transport, & Mechanics, Banff, Alberta
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)
- Society for Developmental Biology (SDB)
- American Physical Society (APS)
- Society for Political Methodology (SPM)