

# Bhargav Ram Karamched

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## Research Interests

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Biomathematics, Biomolecular Feedback Systems, Theoretical Biophysics, Complex Systems, Cellular Neuroscience

## Academic Appointments

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**Florida State University**, Tallahassee, FL, USA

Assistant Professor of Biomathematics

August 2020 - present

Graduate Faculty Member of Program in Molecular Biophysics

August 2020 - present

Graduate Faculty Member of Program in Neuroscience

March 2022 - present

**The University of Houston**, Houston, TX, USA

Lecturer

January 2018 - July 2020

## Education

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**The University of Houston**, Houston, TX, USA

Postdoctoral Fellow

June 2017 - July 2020

- Advisor: Krešimir Josić

**The University of Utah**, Salt Lake City, UT, USA

Ph. D., Mathematics, May 2017

**Thesis Title:** “Mathematical Models of Motor-Based Intracellular Transport”

- Advisor: Paul Bressloff
- GPA: 4.0

**The University of Oklahoma**, Norman, Oklahoma, USA

B.S., Mathematics, May 2012

- GPA: 4.0

**The University of Oklahoma**, Norman, Oklahoma, USA

B.S., Biochemistry, May 2012

- GPA: 4.0

## Publications

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28. L. M. Leong, D. Wharton, N. Subramanian, **B. R. Karamched**, R. Bertram, and D. A. Storage. Evidence that interglomerular inhibition generates non-monotonic concentration-response relationships in mitral/tufted glomeruli in the mouse olfactory bulb. *Journal of Physiology*. (2026).

27. MV Ciocanel and **B. R. Karamched**. Both Sides Now: Modeling Motor Regulation of Microtubule Length at Both Ends. *Physical Biology*. 23 036001 (2026).
26. V. L. DeVito and **B. R. Karamched**. Signed, Sealed, Delivered: A Generalizable Model for Living Biotherapeutic Dosing and Metabolism. *npj Systems Biology* 12, 48 (2026).
25. C. Ryzowicz, R. Bertram, and **B. R. Karamched**. Dynamic Homeostasis in Relaxation and Bursting Oscillations. *SIAM Journal on the Life Sciences*. 1:1, 1-29 (2026).
24. **B. R. Karamched**, J. Schmidt, D. Murrugarra. Observability of Complex Systems via Conserved Quantities. *Physica D: Nonlinear Phenomena*. 477: 134714 (2025).
23. Z. Dere, N. G. Cogan, and **B. R. Karamched**. Optimal Control Strategies for Mitigating Antibiotic Resistance: Integrating Virus Dynamics for Enhanced Intervention Design. *Mathematical Biosciences*. 386: 109464 (2025).
22. C. Ryzowicz, R. Bertram, and **B. R. Karamched**. Oscillations in Delayed Positive Feedback Systems. *Physical Chemistry Chemical Physics*. **26**, 24861-24869 (2024).
21. S. Hartman, S. D. Ryan, and **B. R. Karamched**. Walk this Way: Modeling Foraging Ant Dynamics in Multiple Food Source Environments. *Journal of Mathematical Biology* 89, 41 (2024).
  - Featured in FSU Press Release
20. S. Linn, S. D. Lawley, **B. R. Karamched**, Z. P. Kilpatrick, and K. Josić. Fast decision reflect biases; slow decision do not. *Physical Review E*. 110, 024305 (2024).
  - Featured in *New Scientist Magazine*
  - Featured in *The Standard - Uganda Magazine*
  - Featured in FSU, CU-Boulder, and Utah Press Releases
19. M. Stickler, W. Ott, Z. P. Kilpatrick, K. Josić, and **B. R. Karamched**. Impact of Correlated Information on Pioneering Decisions. *Physical Review Research*. 5, 033020 (2023).
18. **B. R. Karamched** and C. E. Miles. Stochastic Switching of Delayed Feedback Suppresses Oscillations in Genetic Regulatory Systems. *Journal of Royal Society Interface*. 20: 20230059 (2023).
17. F. Bai, R. Bertram, **B. R. Karamched**. A Mathematical Study of the Efficacy of Possible Negative Feedback Pathways Involved in Neuronal Polarization. *Journal of Theoretical Biology*. 111561 (2023).
16. R. Godin, **B. R. Karamched**, S. D. Ryan. The Space Between Us: Modeling Spatial Heterogeneity in Synthetic Microbial Consortia Dynamics. *Biophysical Reports*. 100085 (2022).
  - Featured in FSU and Cleveland St. Press Releases
15. **B. R. Karamched**, G. Hripcsak, R. L. Leibel, D. J. Albers, and W. Ott. Delay-Induced Uncertainty in the Glucose-Insulin System: Pathogenicity for Obesity and Type-2 Diabetes Mellitus. *Frontiers in Physiology*. 13:936101 (2022).
14. F. Bai, R. Bertram, **B. R. Karamched**. A Closed-Loop Multi-Scale Model for Intrinsic Frequency-Dependent Regulation of Axonal Growth. *Mathematical Biosciences*. 344: 108768 (2022).
13. J. J. Winkle, **B. R. Karamched**, M. R. Bennett, W. Ott, and K. Josić. Emergent Spatiotemporal Population Dynamics with Cell-Length Control of Synthetic Microbial Consortia. *PLoS Comput Biol*. 17(9): e1009381 (2021).
12. I. Kemler, **B. R. Karamched**, C. Neuhauser, D. Dingli. Quantitative Imaging and Dynamics of Tumor Therapy with Viruses. *The FEBS Journal*. (2021)

11. **B. R. Karamched**, G. Hripcsak, D. J. Albers, and W. Ott. Delay-Induced Uncertainty in a Paradigmatic Glucose-Insulin Model. *Chaos*. **31** 023142 (2021).
10. **B. R. Karamched**, M. Stickler, B. Lindner, Z. P. Kilpatrick, W. Ott, and K. Josić. Heterogeneity Improves Speed and Accuracy in Social Networks. *Physical Review Letters* **125**, 218302 (2020)
  - Editors' Suggestion for *Physical Review Letters*
  - Featured in *Physics Magazine*
  - Featured in *Physics Today*
  - Featured in Florida St. University and University of Colorado-Boulder Press Releases
  - Featured in the Denver Local News
9. **B. R. Karamched**, S. Stolarczyk, Z. P. Kilpatrick, and K. Josić. Optimal Evidence Accumulation on Social Networks. *SIAM Journal on Applied Dynamical Systems* **19**(3) 1884-1919 (2020)
8. R. N. Alnahhas, J. J. Winkle, A. J. Hirning, **B. R. Karamched**, W. Ott, K. Josić, and M. R. Bennett. Spatiotemporal Dynamics of Synthetic Microbial Consortia in Microfluidic Devices. *ACS Synthetic Biology* **8**: 2051-2058 (2019)
7. **B. R. Karamched**, W. Ott, I. Timofeyev, R. N. Alnahhas, M. R. Bennett, and K. Josić. Moran Model of Spatial Alignment in Microbial Colonies. *Physica D: Nonlinear Phenomena*.(2019)
6. P. C. Bressloff and **B. R. Karamched**. Doubly Stochastic Poisson Model of Flagellar Length Control. *SIAM Journal on Applied Mathematics* **78**(2), 719-741 (2018)
5. P. C. Bressloff, **B. R. Karamched**, S. D. Lawley, and E. Levien. Diffusive Transport in the Presence of Stochastically Gated Absorption. *Physical Review E* **96** (2) (2017).
4. **B. R. Karamched** and P. C. Bressloff. Effects of Cell Geometry on Reversible Vesicular Delivery. *Journal of Physics A: Mathematical and Theoretical* **50** 055601 (2017).
  - Highlight in Biological Modeling of *Journal of Physics A: Mathematical and Theoretical* for 2017
3. P. C. Bressloff and **B. R. Karamched**. Model of reversible vesicular transport with exclusion. *Journal of Physics A: Mathematical and Theoretical* **49** 345602 (2016)
2. P. C. Bressloff and **B. R. Karamched**. A Frequency-Dependent Decoding Mechanism for Axonal Length Sensing. *Frontiers in Cellular Neuroscience* **9**:281. (2015).
1. **B. R. Karamched** and P. C. Bressloff. Delayed Feedback Model of Axonal Length Sensing. *Biophysical Journal* **108** 2408-2419 (2015).

## Grants

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**Manipulating the Glomerular Map to Probe Olfactory Processing and Perception**, *Pending*. (with Douglas Storce, Adam Dewan, and Richard Bertram)

**Collaborative Research: Physical Origins and Dynamical Consequences of Stochastic Delay in Biomolecular Networks**, *Pending*. (with Will Ott, UH)

**Understanding Oscillations in Delayed Positive Feedback Systems**, *Pending*.

**Simons Travel Award**, 2025-2030 \$42,000

**Provost Travel Award**, 2025 \$1,000

**Dean's Travel Award**, 2025-2026 \$2,000

**CRC Florida State University Seed Grant** - Delay-Induced Uncertainty in Physiological Systems 2023-2025, \$96,000

AMS-Simons Travel Award, 2021-2023, \$5,000

CRC Florida State University First-Year Assistant Professor Award, Summer 2021, \$20,000

## Honors and Awards

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University of Utah Department of Mathematics Outstanding Graduate Student, '15-'16

Phi Beta Kappa '12

University of Oklahoma Henderson Scholar of the Year, '10 - '11

University of Oklahoma Henderson Freshman Scholar of the Year, '08 - '09

Oklahoma Regents Scholarship, University of Oklahoma, '08 - '12

Union High School Valedictorian (Rank 1 of 898), Tulsa, OK, '08

## Teaching Experience

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### Department of Mathematics, Florida State University

*Assistant Professor of Mathematics*

**August 2020 - present**

*Teaching:*

F - Fall      S - Spring      Su - Summer

1. Ordinary Differential Equations - Su25
2. Elementary Partial Differential Equations I - F21 S27 Su22,26
3. Calculus with Analytic Geometry III - F20,23 S21,22
4. Methods of Applied Mathematics I - F22,23
5. Applied Linear Algebra I - F24 S24,25
6. Biomath Projects - S24,26
7. YSP Nonlinear Dynamics - Su24
8. Computational Biology - F24,26
9. Mathematical Modeling - F26

*Seminar Organization:*

1. Biomathematics Journal Club - F23,24,26 S22
2. Biomathematics Seminar - F22, S25

### Department of Mathematics, University of Houston

*Postdoctoral Fellow*

**January 2018 - July 2020**

*Teaching:*

1. Discrete Mathematics - Spring 2019
2. Transitions to Advanced Mathematics - Spring 2018, Spring 2020 (online)

### Department of Mathematics, University of Utah

*Teaching Assistant*

**August 2012 - May 2017**

Duties at various times have included leading lab exercises and teaching.

- *Teaching:*
  - Engineering Calculus I - Fall 2016
  - Honors Engineering Calculus I - Fall 2015
  - Engineering Calculus II - Fall 2013, Spring 2015
  - Honors Engineering Calculus II - Spring 2017
  - Differential Equations and Linear Algebra - Fall 2014
  - Vector Calculus and Partial Differential Equations - Spring 2016
- *Labs:*
  - Engineering Calculus I - Fall 2012
  - Engineering Calculus II - Spring 2013
  - Vector Calculus and Partial Differential Equations - Spring 2014

## Mentoring

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Department of Mathematics, Florida State University

August 2020 - present

- Ph. D. Students
  - Ongoing
    1. Gustav Jenetten - Project: Traffic Jams in Molecular Motor Transport
    2. Christiana Michael - Project: PDE models of Stochastic Delay Systems
    3. Philip Nyamele Asare - Project: Networks of One-Way Switches and Cell Fate
    4. Zainab Dere - Project: Spatiotemporal Dynamics of Viral Infection in Biofilms (with Nick Cogan)
    5. Christopher Ryzowicz - Project: Stochasticity and Delays in Positive Feedback Systems
    6. Noel Milam - Project: Dynamics of Leukemia Initiation and Progression (with Nick Cogan)
  - Graduated
    1. Fan Bai - Neuronal Development: From Polarization to Axon Growth - 2023  
Current Position: Principal Product Development Engineer - The Timken Company - Canton, OH
- Undergraduate Students
  1. Julia Saff - Project: How to Optimally Combine Treatments to Mitigate Mite Infestations in Beehives
  2. Stuti Guha - Project: How Inter-Species Competition Affects Foraging Patterns in Ants
  3. Sean Hartman - Project: How Local Interactions Affect Global Structure in Foraging Ants (Graduated Spring 2023)

Department of Mathematics, University of Houston

June 2018 - July 2020

- Ph. D. Students
  1. Megan Stickler - Project: Decision-Making Dynamics on Networks
  2. Deepjyoti Ghosh - Project: Reliability Failure in Glucose-Insulin Dynamics: Theory and Clinical Studies
- Undergraduate Students
  1. Tammy Lam - Project: Reservoir Computing for Chaotic Glucose-Insulin Oscillations
- High School Students
  1. Aprameya Sudarshan - Generalizing the Two Brothers Problem

## Leadership Roles

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1. **Secretary/Treasurer** for SIAM Southeastern Atlantic Section 2024 - 2026

## Organization

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1. **Minisymposium - Exploring Effects of Stochasticity, Delay, and Network Architecture on Dynamics of Biomolecular Feedback Systems**  
SIAM Conference on the Life Sciences, July 6-9, 2026  
Huntington Convention Center of Cleveland, Cleveland, OH, USA
2. **Minisymposium - Biological Oscillations in Celebration of Richard Bertram's 60th Birthday**  
SIAM Conference on the Applications of Dynamical Systems, May 11-15, 2025  
Sheraton Denver Downtown, Denver, CO, USA  
Co-organizer: Nicholas Cogan
3. **Minisymposium - Insights from Stochasticity in Intracellular Processes**  
SIAM Conference on the Life Sciences, June 10-13, 2024  
Hilton Portland Downtown, Portland, OR, USA  
Co-organizer: Youngmin Park
4. **Minisymposium - Dynamics of Decisions and Behavior in Social Systems**  
SIAM Conference on Dynamical Systems, May 14-18, 2023  
Doubletree by Hilton Hotel, Portland, OR, USA  
Co-organizers: Krešimir Josić, Zachary Kilpatrick
5. **Minisymposium - Understanding Spatiotemporal Dynamics and Complex Systems in Multi-Scale Biological Processes**  
SIAM Conference on the Life Sciences, July 10-14, 2022  
David L. Lawrence Convention Center, Pittsburgh, PA, USA  
Co-organizer: Gaoyang (Bridget) Fan
6. **Minisymposium - Modeling and Data Science in Quantitative Biology: Predictions and Descriptions**  
SIAM Southeastern Atlantic Section Conference, September 18 - 19, 2021  
Auburn University, Auburn, AL, USA
7. **Minisymposium - Lattice Models and Agent-Based Models in Biology: Linking Individual Properties to Population Properties**  
SMB Annual Meeting, June 13-17, 2021 (Virtual)

8. **Minisymposium - Mechanisms Underlying Dynamical Processes in Cellular and Systems Physiology**  
SIAM Conference on Dynamical Systems, May 23-27, 2021 (Virtual)  
Co-organizer: Gabriela Jaramillo
9. **Minisymposium - Biological Oscillations: From Genes to Populations**  
SIAM TX-LA Sectional Meeting, October 17, 2020 (Virtual)  
Hosted by Texas A&M University, College Station, TX, USA  
Co-organizer: William Ott
10. **Minisymposium - Biological Signaling in Cellular Collectives**  
SIAM Conference on the Applications of Dynamical Systems, May 23, 2019  
Snowbird Ski and Summer Resort, Snowbird, UT, USA  
Co-organizer: William Ott
11. **Minisymposium - Dynamical Models of Individual and Collective Decision-Making**  
SIAM Conference on Life Sciences, August 8, 2018  
Radisson BLU Minneapolis Downtown Hotel, Minneapolis, MN, USA  
Co-organizers: Krešimir Josić, Zachary Kilpatrick
12. **Calculus Carnival**  
University of Utah, November 21, 2013  
Salt Lake City, UT, USA  
Experimented with alternative forms of educational methods to teach key calculus concepts.

## Talks

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1. **Modeling Motor Regulation of Microtubule Length at Both Ends**  
SIAM Conference on the Life Sciences, July 6-9, 2026  
Huntington Convention Center of Cleveland, Cleveland, OH, USA
2. **Delays and Oscillations: Some Counterintuitive Results in Biomolecular Feedback Systems**  
Condensed Matter/Center for Soft Matter and Biological Physics, April 6, 2026  
Virginia Tech, Blacksburg, VA, USA
3. **Modeling Trail Formation and Competition in Foraging Ants Dynamics**  
Applied Mathematics Seminar, March 18, 2026  
University of Tennessee at Knoxville, Knoxville, TN, USA
4. **Modeling Length Sensing in Neurons**  
Undergraduate Neuroscience Seminar, October 8, 2025  
Florida State University, Tallahassee, FL, USA
5. **Delays and Oscillations: Some Counterintuitive Results in Biomolecular Feedback Systems**  
Chemical and Biomedical Engineering Seminar, September 26, 2025  
FSU College of Engineering, Tallahassee, FL, USA
6. **Modeling Foraging Ant Dynamics in Multiple Food Source Environments**  
SIAM Conference on Applications of Dynamical Systems, May 11-15, 2025  
Sheraton Denver Downtown Hotel, Denver, CO, USA
7. **Dynamic Homeostasis in Relaxation and Bursting Oscillations**  
University of California-Irvine Applied Mathematics Seminar, May 5, 2025  
The University of California-Irvine, Irvine, CA, USA

8. **Modeling Foraging Ant Dynamics in Multiple Food Source Environments**  
University of Iowa Mathematical Biology Seminar, March 31, 2025 (Virtual)  
The University of Iowa, Iowa City, IA, USA
9. **Formulation, Approximation, Reduction: A Journey through Stochastic Methods in Theoretical Biology**  
Florida State University Biomathematics Seminar, December 4, 2024  
Florida State University, Tallahassee, FL, USA
10. **Oscillations in Delayed Positive Feedback Systems**  
University of Houston Networks Seminar, September 20, 2024  
University of Houston, Houston, TX, USA
11. **Mechanisms Underlying Spatiotemporal Patterning in Microbial Consortia: A Theoretical Analysis**  
Special UMBC Biomath Seminar, June 25, 2024  
University of Maryland, Baltimore County, Catonsville, MD, USA
12. **Modeling Spatial Heterogeneity in Synthetic Microbial Consortia Dynamics**  
SIAM Conference on Nonlinear Waves and Coherent Structures, June 24-27, 2024  
Lord Baltimore Hotel, Baltimore, MD, USA
13. **Stochastic Switching of Delayed Feedback Suppresses Oscillations in Genetic Regulatory Systems**  
SIAM Conference on the Life Sciences, June 10-13, 2024  
Hilton Portland Downtown, Portland, OR, USA
14. **Stochasticity in Biological Systems**  
OU Mathematics Colloquium, April 25, 2024  
University of Oklahoma, Norman, OK, USA
15. **What is Biophysics?**  
Featured Alumni Student Physics Seminar, April 24, 2024  
University of Oklahoma, Norman, OK, USA
16. **A Possible Mechanism for Neuronal Polarization**  
RIT Applied Mathematics Seminar, April 4, 2024  
Rochester Institute of Technology, Rochester, NY, USA
17. **Formulation, Approximation, Reduction: A Journey Through Techniques used in Stochastic Analysis of Biological Systems**  
FSU Biomathematics Seminar, November 8, 2023  
Florida State University, Tallahassee, FL, USA
18. **Stochastic Switching of Delayed Feedback Suppresses Oscillations in Genetic Regulatory Systems**  
SIAM TX-LA Sectional Meeting, November 3-5, 2023  
The University of Louisiana-Lafayette, Lafayette, LA, USA
19. **Stochastic Switching of Delayed Feedback Suppresses Oscillations in Genetic Regulatory Systems**  
University of Florida Biomathematics Seminar, October 12, 2023  
The University of Florida, Gainesville, FL, USA
20. **Stochastic Switching of Delayed Feedback Suppresses Oscillations in Genetic Regulatory Systems**

University of Iowa Mathematical Biology Seminar, September 25, 2023 (Virtual)  
The University of Iowa, Iowa City, IA, USA

21. **How do Heterogeneity and Correlated Information Affect Decision-Making in Social Networks?**  
Annual Meeting of the Society for Mathematical Biology, July 17-21, 2023  
The Ohio State University, Columbus, OH, USA
22. **Mechanisms Underlying Spatiotemporal Patterning in Microbial Collectives: A Mathematical Perspective**  
Virginia Commonwealth University Biomath Seminar, January 20, 2023 (Virtual)  
Virginia Commonwealth University, Richmond, VA, USA
23. **The Mathematics of Neurite Polarization**  
University of Kentucky Applied Mathematics Colloquium, October 20, 2022  
University of Kentucky, Lexington, KY, USA
24. **Linking Individual Properties to Population Structure in Biological Systems**  
Duke University Mathematical Biology Colloquium, September 23, 2022 (Virtual)  
Duke University, Durham, NC, USA
25. **Cells, Networks, and Engineering Life: A Journey through Biomathematics**  
FSU Biomathematics Seminar, August 31, 2022  
Florida State University, Tallahassee, FL, USA
26. **Linking Cell Shape to Population Structure in Synthetic Bacterial Collectives: A Theoretical Perspective**  
SIAM Conference on Life Sciences, July 10-14, 2022  
David L. Lawrence Convention Center, Pittsburgh, PA, USA
27. **Optimal Decision-Making in Social Networks**  
West Virginia University Mathematics Colloquium, April 22, 2022  
West Virginia University, Morgantown, WV, USA
28. **Molecular Motors and Axons: A Mathematical Perspective on the Role Motors Play in Vesicle Delivery in Axons and Length Sensing of Axons**  
Florida State University Neuroscience Colloquium, March 2, 2022  
Florida State University, Tallahassee, FL, USA
29. **Mechanisms Underlying Spatiotemporal Patterning in Microbial Collectives: A Model's Perspective**  
Georgia Tech Mathematical Biology Seminar, February 23, 2022  
Georgia Institute of Technology, Atlanta, FL, USA
30. **Lattice Models in Synthetic Biology and Cancer: How simple models and help us understand complex spatiotemporal systems**  
Florida State University Biomathematics Seminar, October 27 2021  
Florida State University, Tallahassee, FL, USA
31. **Delay-Induced Uncertainty in a Paradigmatic Glucose-Insulin Model**  
SIAM Southeastern Atlantic Section Conference, September 18-19, 2021  
Auburn University, Auburn, AL, USA
32. **Spatial Model of Oncolytic Virotherapy: Targeting Drug-Resistant Mutants**  
SMB Annual Meeting, June 13-17, 2021 (Virtual)  
University of California-Riverside, Riverside, CA, USA

33. **Delay-Induced Uncertainty in a Paradigmatic Glucose-Insulin Model**  
SIAM Conference on Applications of Dynamical Systems, May 23-27, 2021 (Virtual)  
Portland, OR, USA
34. **Optimal Decision-Making in Social Networks**  
University of California-Riverside Applied Math and PDE Seminar, March 10, 2021 (Virtual)  
University of California-Riverside, Riverside, CA, USA
35. **Optimal Decision-Making in Social Networks**  
Florida State University Scientific Computing Colloquium, March 3, 2021 (Virtual)  
Florida State University, Tallahassee, FL, USA
36. **Controlling Emergent Spatiotemporal Patterns in Synthetic Consortia: A Modeling Perspective**  
Cleveland State University Mathematics Colloquium, February 26, 2021 (Virtual)  
Cleveland State University, Cleveland, OH, USA
37. **Optimal Decision-Making in Social Networks**  
University of New Mexico Mathematics Colloquium, February 22, 2021 (Virtual)  
University of New Mexico, Albuquerque, NM, USA
38. **Controlling Emergent Spatiotemporal Patterns in Synthetic Consortia: A Modeling Perspective**  
University of Pennsylvania Center for Mathematical Biology Seminar, February 16, 2021 (Virtual)  
University of Pennsylvania, Philadelphia, PA, USA
39. **Bacterial Cell-Shape Modulation and Induced Population Dynamics of Synthetic Microbial Consortia**  
SIAM TX-LA Sectional Meeting, October 17, 2020 (Virtual)  
Texas A&M University, College Station, TX, USA
40. **Bacterial Cell-Shape Modulation and Induced Population Dynamics of Synthetic Microbial Consortia**  
MBI Workshop on Mathematical and Computational Methods in Biology, May 5-7, 2020 (Virtual)  
Mathematical Biosciences Institute, Columbus, OH, USA
41. **Binary Decisions of Large Cliques of Evidence Accumulators**  
APS March Meeting, March 2-6, 2020 (Virtual)  
Denver, CO, USA
42. **From Individuals to Populations: How features and interactions of individuals shape population dynamics**  
Mathematics Colloquium, February 3, 2020  
University of Maine, Orono, ME, USA
43. **From Individuals to Populations: How features and interactions of individuals shape population dynamics**  
Mathematics Colloquium, January 24, 2020  
Florida State University, Tallahassee, FL, USA
44. **Explaining and Controlling Spatiotemporal Patterns of Synthetic Microbial Consortia in Microfluidic Devices: A Model's Perspective**  
Structural Biology/Biochemistry Seminar, January 23, 2020  
Florida State University, Tallahassee, FL, USA
45. **From Individuals to Populations: How features and interactions of individuals shape population dynamics**

Mathematics Colloquium, December 13, 2019  
Clarkson University, Potsdam, NY, USA

46. **Evidence Accumulation and Decision-Making on Social Networks**  
Networks Seminar, September 27, 2019  
University of Houston, Houston, TX, USA
47. **Evidence Accumulation and Decision-Making on Social Networks**  
Data Science Seminar, September 13, 2019  
University of Houston, Houston, TX, USA
48. **Moran Model of Spatial Alignment in Microbial Colonies**  
SIAM Conference on Applications of Dynamical Systems, May 19-24, 2019  
Snowbird Summer and Ski Resort, Snowbird, UT, USA
49. **Moran Model of Spatial Alignment in Microbial Colonies**  
SIAM TX-LA Sectional Meeting, October 5-7, 2018  
Louisiana State University, Baton Rouge, LA, USA
50. **Evidence Accumulation and Decision-Making on Networks**  
SIAM Conference on the Life Sciences, August 6-9, 2018  
Radisson BLU Minneapolis Downtown, Minneapolis, MN, USA
51. **Boundary-Driven Emergent Spatiotemporal Order in Growing Microbial Colonies**  
Conference on Mathematical Approaches to Cell-Cell Communication and Collective Behaviours,  
July 9-13, 2018  
Banff International Research Station, Banff, Alberta, Canada
52. **Evidence Accumulation and Decision-Making on Networks**  
Mathematical Neuroscience Workshop, February 28 - March 1, 2018  
University of Colorado-Boulder, Boulder, CO, USA
53. **Frequency Dependent Gene Expression for Axonal Length Sensing**  
Mathematical Neuroscience Workshop, September 8, 2017  
University of Colorado-Boulder, Boulder, CO, USA
54. **Doubly Stochastic Poisson Model of Flagellar Length Control**  
Annual Meeting of the Society for Mathematical Biology, July 17-21, 2017  
University of Utah, Salt Lake City, UT, USA
55. **Effects of Cell Geometry on Reversible Vesicular Delivery**  
SIAM Conference on Applications of Dynamical Systems, May 21-25, 2017  
Snowbird Ski and Summer Resort, Snowbird, UT, USA
56. **Mathematical Models of Motor-Based Intracellular Transport**  
Networks Group Meeting, April 12, 2017  
University of Houston, Houston, TX, USA
57. **The Princess Problem**  
Undergraduate Mathematics Colloquium, March 29, 2017  
University of Utah, Salt Lake City, UT, USA
58. **Motor-Based Delivery of Vesicles to Localized Cellular Targets**  
Tim Elston Lab Seminar, November 30, 2016  
University of North Carolina, Chapel Hill, NC, USA

59. **Modeling Hard-Core Repulsion in Transport Processes**

Applied Math Group, November 3, 2016  
University of Utah, Salt Lake City, UT, USA

## Posters

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1. **A Mechanism for Axonal Length Sensing**

Florida State University First Year Assistant Professor (FYAP) Workshop, September 10, 2021 (Virtual)

2. **Boundary-Driven Emergent Spatiotemporal Order in Growing Microbial Colonies**

University of Houston Postdoc Symposium, July 20-21, 2018  
UH Hilton Hotel, Houston, TX, USA

- Winner! Best Poster

3. **Boundary-Driven Emergent Spatiotemporal Order in Growing Microbial Colonies**

Conference on Quantitative Biology, June 26-29, 2018  
BioScience Research Collaborative, Houston, TX, USA

4. **Evidence Accumulation and Decision-Making on Networks**

COSYNE 2018, March 1-4, 2018  
Downtown Hilton Hotel, Denver, CO, USA

5. **Evidence Accumulation and Decision-Making on Networks**

Gulf Coast Consortium for Theoretical and Computational Neuroscience, January 26, 2018  
BioScience Research Collaborative, Houston, TX, USA

6. **Science Day**

University of Utah, November 12, 2016  
Salt Lake City, UT, USA

Gave poster presentation to middle and high school students and encouraged them to pursue a career in science and mathematics.

7. **A Model of Reversible Vesicular Transport with Exclusion**

Spatially Distributed Stochastic Dynamical Systems in Biology Conference, June 20-24, 2016  
Isaac Newton Institute for Mathematical Sciences, Cambridge, UK

8. **Science Day**

University of Utah, November 17, 2015  
Salt Lake City, UT, USA

Gave poster presentation to high school students and encouraged them to pursue a career in science and mathematics.

9. **A Frequency-Dependent Decoding Mechanism for Axonal Length Sensing**

SIAM Conference on Applications of Dynamical Systems, May 17-21, 2015  
Snowbird Ski and Summer Resort, Snowbird, UT, USA

10. **Delayed Feedback Model of Axonal Length Control**

MBI Axonal Transport and Neuronal Mechanics Conference, November 3-7, 2014  
The Ohio State University, Columbus, OH, USA

## Professional Service

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- Institutional Service for FSU

1. Biomathematics Graduate Student Selection Committee - 2024 - present
  2. **Chair** of Mathematics Library Committee - 2023 - present
  3. **Chair** of IMB Specialized Faculty Evaluation Committee - 2023
  4. IMB Specialized Faculty Evaluation Committee - 2022 - 2024
  5. Mathematics Colloquium Committee - 2022 - 2024
  6. Honor Guard - College of Arts and Sciences Convocation - May 2021
- Book Reviews
    1. Goriely, Alain. *The Mathematics and Mechanics of Biological Growth*. Vol. 45. Springer, 2017.
  - Reviewer for
    1. *Journal of Theoretical Biology*
    2. *Physical Chemistry Chemical Physics*
    3. *Journal of Mathematical Biology*
    4. *Chaos*
    5. *Physica D: Nonlinear Phenomena*
    6. *ACS Synthetic Biology*
    7. *Physical Review E*
    8. *Mathematical Biosciences*
    9. *Mathematics and Computers in Simulation*
    10. *Physical Review Letters*
    11. *eLife*
    12. *SIAM Journal on Applied Dynamical Systems*

## Memberships

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1. Society for Industrial and Applied Mathematics (SIAM) (2015-Present)
2. Society for Mathematical Biology (SMB) (2017-Present)
3. American Physical Society (APS) (2019-Present)
4. American Mathematical Society (AMS) (2021-Present)

## Computer Skills

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- *Languages*: Java, C++, Python, Matlab, Maple, Mathematica
- *Tools and Applications*:  $\LaTeX$ , MS Office tools or equivalent
- *Operating Systems*: Windows, OS X, Linux