

Stephanie Dodson — PhD

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Academic Appointments

Colby College <i>Assistant Professor of Mathematics</i>	Waterville, ME 2022 – Present
University of California Davis <i>Krener Assistant Professor, Department of Mathematics</i>	Davis, CA 2019 – 2022

Education

Brown University <i>PhD, Applied Mathematics</i> Thesis Advisor: Dr. Björn Sandstede, Division of Applied Mathematics Thesis: Wave propagation in spatially extended systems <i>Master of Science, Applied Mathematics</i>	Providence, RI May 2019 May 2015
University of Massachusetts, Amherst <i>Bachelor of Science, Mathematics</i> <i>Bachelor of Science, Physics</i> Commonwealth Honors College Scholar with Greatest Distinction, Summa cum laude	Amherst, MA May 2014 May 2014

Publications

Pre-prints

- 2026 O. Clifton, **S. Dodson**, and D.B. Cooney. Kernel-Dependent Pattern Formation in a Population Model with Nonlocal Facilitation and Competition. [arXiv:2608.23964](https://arxiv.org/abs/2608.23964) (2026).

Published

- 2026 **S. Dodson**, R. Goh, B. Sandstede. Efficient numerical computation of spiral spectra with exponentially weighted preconditioners. *IMA Journal of Numerical Analysis* (2026).
- 2025 **S. Dodson**, E. E. Meyer, T. J. Lewis. Curvature-dependent stabilities and instabilities of a pacemaking region in excitable tissue. *Chaos*, **35** (2025) 063143.
- 2024 **S. Dodson**, W.K. Oestreich, M.S. Savoca, E.L. Hazen, S.J. Bograd, J.P. Ryan, J. Fiechter, and B. Abrahms, Long-distance communication can enable collective migration in a dynamic seascape, *Scientific Reports* **14**, 14857 (2024).
- 2022 **S. Dodson** and T.J. Lewis, Wave Reflections in Excitable Media Linked to Existence and Stability of One-Dimensional Spiral Waves, *SIAM Journal on Applied Dynamical Systems*, **21** 2 (2022) 1631-1659.
- 2022 **S. Dodson** and B. Sandstede, Behavior of Spiral Wave Spectra with a Rank-Deficient Diffusion Matrix, *SIAM Journal on Mathematical Analysis*, **54** 3 (2022) 3789-3816.
- 2020 **S. Dodson**, B. Abrahms, S.J. Bograd, J. Fiechter, and E.L. Hazen. Disentangling the biotic and abiotic drivers of emergent migratory behavior using individual-based models, *Ecological Modelling*, **432** (2020): 109225.
- 2019 **S. Dodson**, B. Sandstede. Determining the Source of Period-Doubling Instabilities in Spiral Waves, *SIAM Journal on Applied Dynamical Systems* **18**, 4 (2019) 2202-2226.

- 2018 H.M. McNamara, **S. Dodson**, Y-L Huang, E.W. Miller, B. Sandstede, and A.E. Cohen. Geometry-Dependent Arrhythmias in Electrically Excitable Tissues, *Cell Systems*, October 2018, doi.org/10.1016/j.cels.2018.08.013.

Fellowships, Grants, and Awards

2020 **AMS-Simons Travel Grant**

2018 **National Science Foundation Graduate Research Internship Program (NSF GRIP)**

2015 **National Science Foundation Graduate Research Fellowship (NSF GRFP)**

Recent Conference Travel Awards:

- 2025 Travel Award to attend and participate in the Workshop Celebrating Diversity at SIAM Annual Meeting
- 2024 AMS Travel Award to attend 2024 JMM
- 2020 SIAM Early Career Travel Award
- 2018 SIAM Student Travel Award

Selected Awards:

- 2019 *Stella Dafermos Award*, Division of Applied Mathematics, Brown University
- 2018 *Association for Women in Mathematics Poster Prize*, SIAM Annual Meeting
- 2017 *Red Sock Award for Poster Presentation*, SIAM Conference on Applications of Dynamical Systems
- 2014 *Best Paper Award*, IEEE High Performance Extreme Computing Conference
- 2013 *William F. Field Alumni Scholar*, University of Massachusetts, Amherst

Presentations (2022 - present)

Conference Keynote Presentation (Invited)

- 2024 **Dynamics Days**, University of California Davis
Accurate numerical computations of spiral spectra using exponentially weighted spaces, January 2024.

Conference Minisymposium Presentations (Invited)

- 2026 **SIAM Mathematics of Planet Earth**, Cleveland, OH
Pattern Formation in a Model with Nonlocal Facilitation and Competition, July 2026.
- 2026 **SIAM Nonlinear Waves and Coherent Structures**, Montreal, Canada
Accurate numerical computations of spiral spectra using exponentially weighted spaces, May 2026.
- 2026 **AMS Eastern Sectional Meeting**, AMS Special Session, Boston, MA
Pattern formation in a model with nonlocal facilitation and competition, March 2026.
- 2025 **SIAM Annual Meeting**, Montreal, Canada
Reflections of Traveling Waves in Models of Cardiac Dynamics, July 2025.
- 2025 **SIAM Conference on Applications of Dynamical Systems**, Denver, CO
Accurate numerical computations of spiral spectra using exponentially weighted spaces, May 2025.
- 2024 **SIAM Annual Meeting**, Spokane, WA
Curvature-dependent onset of oscillations in excitable tissue, July 2024.
- 2024 **Joint Mathematics Meetings**, AMS Special Session, San Francisco, CA
Toward investigating traveling waves in biophysical models of cardiac dynamics, January 2024.
- 2023 **International Congress on Industrial and Applied Mathematics (ICIAM)**, Tokyo, Japan
Toward investigating traveling waves in biophysical models of cardiac dynamics, August 2023.
- 2023 **SIAM Conference on Applications of Dynamical Systems**, Portland, OR
When curvature promotes or obstructs the ability of a pacemaking region to drive activity in excitable tissue, May 2023.

- 2023 **Joint Mathematics Meetings**, AMS Special Session, Boston, MA
Animal migration enables collective migration in a dynamic seascape, January 2023
- 2023 **Joint Mathematics Meetings**, AMS Special Session, Boston, MA
When curvature promotes or obstructs the ability of a pacemaking region to drive activity in excitable tissue, January 2023
- 2022 **SIAM Conference on Nonlinear Waves and Coherent Structures** (virtual)
My presentation cancelled due to COVID, August 2022.

Colloquium Presentations (Invited)

- 2026 **Mathematical Biology Seminar**, University of California Davis, Davis, CA
Pattern formation in a model with nonlocal facilitation and competition, May 2026.
- 2025 **Mathematical Biology Seminar** (virtual), University of Iowa
Curvature-dependent onset of oscillations in excitable tissue, October 2025.
- 2025 **Midwest Mathematical Biology Seminar** (virtual), hosted by Purdue University and UIUC
Curvature-dependent onset of oscillations in excitable tissue, April 2025.
- 2023 **Mathematics Colloquium**, University of Maine Orono
Traveling waves and cardiac arrhythmia: Investigating the onset of abnormal heart rhythms with mathematical models, November 2023.
- 2023 **Dynamical Systems Seminar**, Boston University
Behavior of Spiral Wave Spectra with a Rank-Deficient Diffusion Matrix, April 2023.
- 2023 **Analysis and Applied Math Seminar**, Kennesaw State University (virtual)
Influence of local curvature on the formation of ectopic rhythms in cardiac tissue, April 2023.
- 2022 **CRM Applied Mathematics Seminar**, Concordia University (virtual)
When curvature promotes or obstructs the ability of a pacemaking region to drive activity in excitable tissue, December 2022.

Contributed Presentations

- 2026 **Colby-Bowdoin-Bates Mathematics Colloquium**, Bowdoin College, ME
Pattern formation in a model with nonlocal facilitation and competition, April 2026.
- 2023 **Colby Science Lunch**
(Toward) Investigating traveling waves in biophysical models of cardiac dynamics, November 2023.
- 2022 **Mathematics Colloquium**, Colby College
Animal migration enables collective migration in a dynamic seascape, October 2022

Workshops Attended

- 2025 Patterns, Dynamics, and Data in Complex Systems Workshop, ICERM, Providence, RI, January 2025.
- 2023 Complex Social Systems: AMS Mathematics Research Community, Java Center, NY, June 2023.
- 2021 Dynamics of Waves and Patterns Workshop, Oberwolfach Research Institute for Mathematics, August 2021.
- 2019 Applied Mathematical Modeling with Topological Techniques Workshop, ICERM, Providence, RI, August, 2019.

Teaching

Experience at Colby

Fall 2026	MA 130: Single Variable Calculus Revisited MA 311: Ordinary Differential Equations
Spring 2025	MA 311: Ordinary Differential Equations MA 332: Numerical Analysis
Fall 2024	MA 130: Single Variable Calculus Revisited (2 sections) MA 311: Ordinary Differential Equations
Spring 2024	MA 311: Ordinary Differential Equations MA 262: Vector Calculus
Fall 2023	MA 311: Ordinary Differential Equations MA 411: Topics in Differential Equations
Spring 2023	MA 311: Ordinary Differential Equations MA 332: Numerical Analysis
Fall 2022	MA 160: Series & Multivariable Calculus MA 311: Ordinary Differential Equations

Pedagogical Training

Learning Assistant Program, Colby College

MA 130: Single Variable Calculus Revisited, Fall 2026
MA 130: Single Variable Calculus Revisited, Fall 2024
MA 311: Ordinary Differential Equations, Fall 2023

Course (Re)Design Institute, Colby College

MA 311: Ordinary Differential Equations, August 2026
MA 311: Ordinary Differential Equations, August 2022

Experience Prior to Colby College:

Spring 2022	Instructor , Reading Course on traveling waves and cardiac dynamics, UC Davis
Winter 2022	Instructor , Calculus for Biosciences, UC Davis
Fall 2021	Instructor , Partial Differential Equations, UC Davis
Fall 2020	Instructor , Introduction to Abstract Mathematics (Remote), 2 sections, UC Davis
Spring 2020	Instructor , Mathematical Biology (Remote), UC Davis
Fall 2019	Instructor , Introduction to Abstract Mathematics, UC Davis
Summer 2017	Instructor , Applied Ordinary Differential Equations, Brown University
Spring 2016	Teaching Assistant , Method of Applied Mathematics I, Brown University
Fall 2015	Teaching Assistant , Applied Ordinary Differential Equations, Brown University

Service (2022 - Present)

Conferences, Seminars, and Minisymposia Organized

- 2026 **Scientific Organizing Committee**, SIAM Nonlinear Waves and Coherent Structures, Montreal, Canada
Responsible for selecting invited keynote speakers, conference themes and priorities
- 2026 **Minisymposium Organizer**, SIAM Nonlinear Waves and Coherent Structures, Montreal, Canada
Co-organizer of *Coherent Structures in Biology and Social Sciences*, May 2026.
- 2025 **Poster Judge Coordinator**, SIAM Conference on Applications of Dynamical Systems, Denver, CO.
Invited and coordinated over 25 judges to rank over 90 posters and determine winners of the annual Red Sock poster award. May 2025.
- 2025 **Organizing Committee**, Patterns, dynamics, and data in complex systems, ICERM, Providence, RI.
One of five co-organizers of week long topics workshop, January 2025.
- 2024 **Minisymposium Organizer**, SIAM Annual Conference, Spokane, WA.
Co-organizer of *Excitable media dynamics: methods and models from traveling waves to cardiac fibrillation*, July 2024.
- 2024 **(Invited) Minisymposium Organizer**, Equadiff Conference, Karlstad University, Sweden.
Co-organizer of MS 22: *Nonlinear Waves in Reaction-Diffusion Equations*, June 2024.
- 2023 **Scientific Organizing Committee**, Dynamics Days US 2023 (virtual)
Responsible for selecting invited keynote speakers, conference themes and priorities, January 2023.

Mentoring & Outreach

- 2024 **Poster Reviewer and Mentor**, AWM Workshop at SIAM Annual Meeting, Spokane, WA
Provided feedback on graduate student posters and served as mentor for two graduate students.
- 2023 **SCUDEUM Contest Judge**
Provided judging for student models and presentations.
- 2023 **Poster Judge**, SIAM Dynamical Systems, Portland, OR
Provided judging for posters
- 2023 **Poster Reviewer**, Joint Mathematics Meetings, Boston, MA
Provided feedback on four posters in the AMS-PME undergraduate poster session
- 2022 **EvenQuads Deck 2 Fact Checker**
Volunteered as fact checker for content on Deck 2 of *EvenQuads*, a card deck and game sponsored by the Association for Women in Mathematics that promotes the work of women mathematicians.

Journals Refereed: *Chaos*, *Bulletin of Mathematical Biology*, *Ecological Modelling*, *Ecology Letters*, *IMA Journal of Applied Mathematics*, *Marine Ecology Progress Series*, *Physica D*, *PLOS One*, *SIADS*

Professional Organizations: American Mathematics Society (AMS), Association for Women in Mathematics (AWM), Society for Industrial and Applied Mathematics (SIAM)