

JASPER WEINBURD

Harvey Mudd College
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RESEARCH INTERESTS

Patterns and Coherent Structures, Dynamical Systems, Differential Equations,
Mathematical Modeling, Mathematical Biology and Ecology

EDUCATION

PhD Mathematics, *University of Minnesota – Twin Cities, MN* May 2019
Advisor: Arnd Scheel
Thesis: Patterns Selected by Spatial Inhomogeneity

MSc Mathematics, *University of Minnesota – Twin Cities, MN* December 2016

BA Mathematics, *Bard College, NY* May 2013

EMPLOYMENT

Harvey Mudd College, Claremont, CA 2019–present
NSF Postdoctoral Fellow
*Grant DMS–1902818

St. Olaf College, Northfield, MN Fall 2018
Instructor of Mathematics

University of Minnesota, Minneapolis, MN 2013-2019
Graduate Research Assistant
Course Supervisor
Lecturer
Graduate Teaching Assistant

PUBLICATIONS

- A. J. Bernoff, M. Culshaw-Maurer, R. A. Everett, M. E. Hohn, W. C. Strickland, J. Weinburd. *Agent-based and continuous models of hopper bands for the Australian plague locust: How resource consumption mediates pulse formation and geometry*, submitted. arXiv ID: 1910.14553
- R. Samuelson, Z. Singer, J. Weinburd, A. Scheel. *Advection and autocatalysis as organizing principles for banded vegetation patterns*. *J Nonl Sci* 29:255-285. (2019). DOI: 10.1007/s00332-018-9486-6
- A. Scheel, J. Weinburd. *Wavenumber selection via spatial parameter jump*. *Phil Trans Roy Soc A* 376:20170191 (2018). DOI: 10.1098/rsta.2017.0191

AWARDS AND PRIZES

Mathematical Sciences Postdoctoral Research Fellowship <i>National Science Foundation</i>	July 2019
Summer Collaborators Grant <i>Institute for Advanced Study, Princeton, NJ</i>	June 2019
Society for Industrial and Applied Mathematics (SIAM) Student Travel Award <i>SIAM Conf. on Applications of Dynamical Systems</i>	May 2019
<i>SIAM Conf. on Nonlinear Waves and Coherent Structures</i>	June 2018
<i>SIAM Conf. on Applications of Dynamical Systems</i>	May 2017
Student Poster Prize <i>SIAM Conf. on Life Sciences</i> Awarded to three poster presenters, selected by anonymous judges.	August 2018
Graduate Student Teaching Award <i>Council of Graduate Students, University of Minnesota</i> One of twelve awarded across the university on the basis of student nominations.	May 2014
President Leon Botstein Prize <i>Bard College, Annandale-on-Hudson, NY</i> Awarded annually to a single student for academic excellence across the disciplines.	May 2013
Distinguished Scientist Scholarship <i>Division of Science Mathematics and Computing, Bard College, NY</i> Awarded to a student in the sciences, for academic excellence and commitment.	2011–2013

RESEARCH MENTORSHIP

Co-Mentor, Second Reader <i>Senior Thesis, Harvey Mudd College</i> H. Larson: “Agent-based model for foraging locusts”	2019-present
Co-Mentor <i>Independent Study, Harvey Mudd College</i> M. Velez: “Energetic stability of swarm equilibria”	Fall 2019
Mentor <i>Undergraduate Research Opportunities Program, University of Minnesota</i> Mentored student through funding application and start of project. Y. Cao: “Comparing Models for Vegetation Patterns”	Summer 2018
Independent Study Advisor <i>University of Minnesota</i> Y. Cao: “Numerics for Differential Equations” B. Kolstoe: “Gerrymandering: History, Law, Statistics, and Geometry”	Spring 2018
Co-Mentor <i>Research Experience for Undergraduates, NSF DMS–1311740, University of Minnesota</i> R. Samuelson & Z. Singer: “Advection and Autocatalysis in Banded Vegetation Patterns” P. Flynn & Q. Neville: “Self-Organized Bacterial Clusters in Run and Tumble Processes”	Summer 2017

CONFERENCES AND PRESENTATIONS

INVITED TALKS AND MINISYMPOSIA

Fronts of foraging locusts <i>SIAM Conf. on Analysis of PDEs, La Quinta, CA</i>	December 2019
Patterns deformed by spatial inhomogeneity <i>Applied Math Seminar, Claremont Center for Mathematical Sciences, Claremont, CA</i>	November 2019
Imperfect hexagons deformed by spatial inhomogeneity <i>SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT</i>	May 2019
Collective waves from individual behavior in foraging locusts <i>AMS Special Session, Joint Mathematics Meetings, Baltimore, MD</i>	January 2019
A tale of two models for foraging locusts <i>Research Seminar, St. Olaf College, Northfield, MN</i>	November 2018
Traveling vegetation bands from advection and autocatalysis <i>SIAM Annual Meeting, Portland, OR</i>	July 2018
Advection and autocatalysis in banded vegetation patterns <i>SIAM Conf. on Nonlinear Waves and Coherent Structures, Anaheim, CA</i>	June 2018
Wavenumber selection via spatial parameter step <i>SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT</i>	May 2017
The edge of patterns: spatial transitions <i>Special Seminar, Bard College, Annandale-on-Hudson, NY</i>	September 2016

POSTERS

Advection and conservation in banded vegetation patterns <i>Midwest Dynamical Systems Conference, Minneapolis, MN</i>	November 2018
<i>SIAM Conference on Life Sciences, Minneapolis, MN</i>	August 2018
*Graduate Student Poster Prize	
Wavenumber selection via spatial parameter step <i>Dynamics Days, Silver Spring, MD</i>	January 2017
<i>Workshop in Nonlinear Optics, Inst. for Math. and Applications, MN</i>	October 2016

OTHER SELECTED TALKS

Bifurcations in a model for vegetation patterns <i>Dynamical Systems Seminar, University of Minnesota</i>	February 2018
Gerrymandering and measuring compactness <i>Undergraduate Math Club, University of Minnesota</i>	February 2018

WORKSHOP PARTICIPATION

Introduction to Data Analysis with R & Reproducible Data Science <i>Institute for Research in Statistics and its Applications, U of Minnesota</i>	August 2018
Agent-Based Modeling in Biological and Social Systems <i>Mathematical Research Communities Program, American Mathematical Society, RI</i> Funded to attend introductory workshop with small group work on research-level problems. Maintain ongoing collaboration that has produced preprint and current research questions.	June 2018

TEACHING

St. Olaf College, Northfield, MN Fall 2018
Instructor of Mathematics
 Taught one class of 19 students, with advice and suggestions from colleagues as needed.
 - Calculus II

University of Minnesota – Twin Cities, MN Fall 2017
Course Supervisor
 Designed, managed, and taught one class of 31 students with the help of a graduate TA.
 - Intensive Precalculus

Lecturer Summer 2015
 Taught a summer session of 15 students with graduate colleagues as co-supervisors.
 - Calculus 2

Graduate Teaching Assistant 2013–2019
 Lead discussion sections of ~ 30 students with almost complete autonomy from lecturer.
 - Introduction to Proofs through Analysis (Fall 2015, Spring 2014)
 - Linear Algebra and Differential Equations (Spring 2019, Fall 2016, Spring 2015)
 - Multivariable Calculus (Fall 2018, Spring 2017, Spring 2016, Fall 2014)
 - Calculus I (Fall 2013)

Kay Tutoring, Minneapolis, MN 2014–2016
Private Tutor

Bard College, Annandale-on-Hudson, NY 2010–2012
Mathematical Writing Tutor
Math Study Room Tutor 2010–2011

PROFESSIONAL DEVELOPMENT IN TEACHING

Student Seminar in Undergraduate Mathematics Education 2013–2019
School of Mathematics, University of Minnesota

Seminar on Scholarship of Teaching and Learning in Mathematics 2018
Mathematics Center of Educational Programs, U of Minnesota

To Include is to Excel August 2018
Teaching Summit Breakout Session, St. Olaf College, Northfield, MN

Difficult Dialogues Workshop: How to be a Better Ally July 2018
SIAM Annual Meeting, Portland, OR

Geometry of Redistricting: Educator Workshop October 2017
Metric Geometry and Gerrymandering Group, U. of Wisconsin, Madison, WI

Teaching in Higher Education, Preparing Future Faculty Program Fall 2017
Graduate Course (Elective), University of Minnesota

Undergraduate Coursework 2011–2013
Bard College, Annandale-on-Hudson, NY
 Composition Theory and Pedagogy
 Philosophy of Education

SERVICE

- Guest Speaker December 2019
Gateway to Exploring Mathematical Sciences, Claremont, CA
 Engaged middle and high school students in college-level mathematical ideas through and active presentation in this monthly outreach program.
- Minisymposium Organizer December 2019
SIAM Conf. on Analysis of PDEs, La Quinta, CA
 “Traveling Waves: Selection Principles and Stability”
SIAM Nonlinear Waves and Coherent Structures, Anaheim, CA June 2018
 “Vegetation Patterns: Modeling, Analysis, and Data”
- Science Fair Judge June 2019
KIPP North Star Academy, Minneapolis, MN
 Evaluated poster presentations in a middle school science fair at this college-prep charter school serving low-income middle school students.
- SIAM Student Chapter Representative July 2018
SIAM Annual Meeting, Portland, OR
 Communicated our chapter’s initiatives and programs to other chapters and SIAM leadership.
- Local Site Host Coordinator April 2018
Student Challenge Using Differential Equation Modeling, Minneapolis, MN
 Executed logistics for this undergraduate modeling competition.
- Seminar Organizer 2016–2018
Pattern Formation and Dynamical Systems Research Group, U of Minnesota
 Arranged weekly group meetings with presentations from internal and external colleagues.
- President; Secretary 2014–2016
Student Chapter of the American Mathematical Society, U of Minnesota
 Oversaw weekly Junior Colloquium, Intro to Research seminar, and social teas.
 Secured grant funding from UMN for major math community events (75+ participants).
- Peer Mentor 2014–2016
School of Mathematics, U of Minnesota
 Guided new graduate students throughout their first year.

PROFESSIONAL AFFILIATIONS

Society for Industrial and Applied Mathematics (SIAM)
 American Mathematical Society (AMS)

COMPUTER PROGRAMS & LANGUAGES

MATLAB, Mathematica, L^AT_EX