

JASPER WEINBURD

Harvey Mudd College
301 Platt Blvd.
Claremont, CA 91711

(845) 901-5545
jweinburd@hmc.edu
<http://math.umn.edu/~weinburd>

RESEARCH INTERESTS

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

EDUCATION

PhD Mathematics, <i>University of Minnesota – Twin Cities, MN</i>	May 2019
Advisor: Arnd Scheel	
Thesis: Patterns Selected by Spatial Inhomogeneity	
MSc Mathematics, <i>University of Minnesota – Twin Cities, MN</i>	December 2016
BA Mathematics, <i>Bard College, NY</i>	May 2013

EMPLOYMENT

Harvey Mudd College, Claremont, CA	2019–present
<i>NSF Postdoctoral Fellow</i>	
*Grant DMS–1902818	
St. Olaf College, Northfield, MN	Fall 2018
<i>Instructor of Mathematics</i>	
University of Minnesota, Minneapolis, MN	2013-2019
<i>Graduate Research Assistant</i>	
<i>Course Supervisor</i>	
<i>Lecturer</i>	
<i>Graduate Teaching Assistant</i>	
North Carolina State University, Raleigh, NC	Summer 2012
<i>REU Participant</i>	
Advisors: Aloysius Helminck and Ruth Haas	
Project: Orbits and orders of generalized symmetric spaces	
Bard College, Annandale-on-Hudson, NY	Summer 2010
<i>REU Participant</i>	
Advisor: Gregory Landweber	
Project: Adinkra phase graphs	
<i>Mathematical Writing Tutor</i>	2010-2012
<i>Math Study Room Tutor</i>	2010-2011

PUBLICATIONS

- A. J. Bernoff, M. Culshaw-Maurer, R. Everett, M. Hohn, C. Strickland, J. Weinburd. *Agent-based and continuous models of hopper bands for the Australian plague locust: How resource consumption can mediate pulse formation and geometry*, in prep.
- R. Samuelson, Z. Singer, J. Weinburd, A. Scheel. *Advection and autocatalysis as organizing principles for banded vegetation patterns*. J Nonl Sci (2018).
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
Student Poster Prize <i>SIAM Conf. on Life Sciences</i> Awarded to three poster presenters, selected by anonymous judges.	August 2018
SIAM Student Travel Award <i>SIAM Conf. on Nonlinear Waves and Coherent Structures</i>	June 2018
SIAM Student Travel Award <i>SIAM Conf. on Applications of Dynamical Systems</i>	May 2017
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
Seth Goldfine Memorial Scholarship <i>Bard College, NY</i>	Spring 2012
NYC Managerial Employees Association Scholarship <i>New York City MEA, NY</i>	2011
E. Virgil Conway Scholar Award <i>100 Year Association of New York City, NY</i>	2010

CONFERENCES AND PRESENTATIONS

INVITED TALKS AND MINISYMPOSIA

Imperfect hexagons deformed by spatial inhomogeneity <i>SIAM Conf. on Applications of Dynamical Systems, Snowbird, UT</i>	May 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
The symmetry group of a bubble bath Julia set <i>Senior Science Poster Symposium, Bard College, NY</i>	May 2013
Orbits and orders of generalized symmetric spaces <i>Joint Mathematics Meetings, San Diego, CA</i>	January 2013
Adinkra phase graphs <i>Joint Mathematics Meetings, Boston, MA</i>	January 2012
<i>Discrete Math Day, Saint Michael's College, VT</i>	July 2012

OTHER SELECTED TALKS

A tale of two models for foraging locusts <i>Undergraduate Math Club, University of Minnesota</i>	November 2018
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
The edge of patterns: spatial transitions <i>Junior Colloquium, University of Minnesota</i>	September 2016
A Thompson-like group for rational Julia sets <i>Undergraduate Thesis Defense, Bard College, NY</i>	May 2013

Orbits and orders of generalized symmetric spaces July 2012
Young Mathematicians Conference, The Ohio State University, Columbus, OH

WORKSHOP PARTICIPATION

Introduction to Data Analysis with R & Reproducible Data Science August 2018
Institute for Research in Statistics and its Applications, U of Minnesota

Agent-Based Modeling in Biological and Social Systems June 2018
Mathematical Research Communities Program, American Mathematical Society, RI
 Funded to attend introductory workshop with small group work on research-level problems.
 Maintain ongoing collaboration that has produced preprint and current research questions.

Dynamical Systems Summer School May 2015
University of Houston, Houston, TX

Introduction to Mathematical Physics and Quantization May 2011
University of Notre Dame, South Bend, IN

RESEARCH MENTORSHIP

Mentor Summer 2018
Undergraduate Research Opportunities Program, University of Minnesota
 Mentored student through funding application and start of project.
 Y. Cao: “Comparing Models for Vegetation Patterns”

Independent Study Advisor Spring 2018
University of Minnesota
 Y. Cao: “Numerics for Differential Equations”
 B. Kolstoe: “Gerrymandering: History, Law, Statistics, and Geometry”

Co-Mentor Summer 2017
Research Experience for Undergraduates, NSF DMS–1311740, University of Minnesota
 R. Samuelson & Z. Singer: “Advection and Autocatalysis in Banded Vegetation Patterns”
 P. Flynn & Q. Neville: “Self-Organized Bacterial Clusters in Run and Tumble Processes”

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

Course Supervisor Fall 2017
 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

Science Fair Judge June 2019
KIPP North Star Academy, Minneapolis, MN
 Evaluated poster presentations at this middle school science fair at this college-prep charter school serving low-income 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.

Minisymposium Organizer June 2018
SIAM Nonlinear Waves and Coherent Structures, Anaheim, CA
 Invited colleagues to our session "Vegetation Patterns: Modeling, Analysis, and Data."

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, \LaTeX