

Education

- Brown University**
PhD , Applied Mathematics

Providence, RI
Sept 2019 – May 2024

 - Advisor: Björn Sandstede
 - Awarded: Larry S. Shu Prize in Applied Mathematics
 - Dissertation Title: *Homoclinic Snaking of Spatiotemporal Patterns in Reaction Diffusion Systems*
- University of Sydney**
BSc. (Advanced Mathematics)(Honours), Honours Class I and the University Medal

Sydney, Aus
2014–2017

 - Awarded: Joye Prize in Mathematics for earning the highest mark in the Honours Program
 - Honours in Applied Mathematics with supervisor Martin Wechselberger
 - Major in Mathematics

Employment

- University of Chicago, Dept. of Statistics**
William H Kruskal Instructor

Chicago, IL
Aug 2024 - present

 - Departmental postdoc with mentor Mary Silber
 - Faculty teaching load of 1 course per quarter (except for first quarter of employment)

Publications

- [1] Timothy V Roberts and Björn Sandstede. Homoclinic snaking of contact defects in reaction-diffusion equations. *Nonlinearity*, 38(11):115001, November 2025.
- [2] Kristen E. Harley, Peter Van Heijster, Robert Marangell, Graeme J. Pettet, Timothy V. Roberts, and Martin Wechselberger. (In)stability of Travelling Waves in a Model of Haptotaxis. *SIAM J. Appl. Math.*, 80(4):1629–1653, January 2020.

Papers in Preparation

- [a] Timothy V Roberts, Paul Carter, Karl Glasner. Existence of amphiphilic bilayer and micelle equilibria in a density functional model. Submission expected in June.
- [b] Timothy V Roberts, Punit Gandhi, Mary Silber. Curvature and confinement: dryland vegetation patterns on undulating, sloped terrain.
- [c] Tina Wang, Punit Gandhi, Timothy V Roberts, Mary Silber. Wavenumber selection for a random kick-flow model of dryland vegetation pattern formation.

Awards

- Best Poster Presentation**
Awarded for best early career poster

MDDLs 2025
2025
- Larry S. Shu Prize in Applied Mathematics**
Awarded to graduating PhD student for excellence in applied math

Brown University
2024
- SIAM Brown Student Chapter certificate of recognition**
Awarded for service in the SIAM Student Chapter

Brown University
2022
- Honourable mention for Von Neumann Prize**
Awarded to the runner-up for best student talk at AustMS

AustMS 2018
2018

- **Joye Prize in Mathematics** University of Sydney
Awarded for achieving the highest grade in the Honours program 2017
- **K E Bullen Memorial Prize in Applied Mathematics** University of Sydney
Awarded to most outstanding applied math honours student 2017
- **University of Sydney Honours Scholarship** University of Sydney
Awarded to commencing honours students based on merit 2017
- **University of Sydney Academic Merit Prize** University of Sydney
Awarded to students on the basis of academic merit 2014, 2015, 2016, 2017
- **Dean's List of Excellence in Academic Performance** University of Sydney
Awarded to students on the basis of academic merit 2014, 2015, 2016, 2017
- **K E Bullen Memorial Scholarship No 1 in Applied Mathematics** University of Sydney
Awarded to senior student with highest proficiency in applied maths units 2016
- **Denison Mathematics and Statistics Summer Research Scholarship** University of Sydney
Awarded to fund undergraduate summer research project 2015, 2016

MiniSymposia Organized

- **SIAM Mathematics of Planet Earth 2026** Cleveland, OH
MS17: The Mathematics of Resilience; Dynamics, Robustness and Tipping
- **SIAM Nonlinear Waves and Coherent Structures 2026** Montreal, Canada
MS25: The Dynamics of Localized Patterns

Presentations

Invited Talks.....

- **AMS Spring Eastern Sectional Meeting 2026** Boston, MA
Curvature and Confinement: Resilience of Vegetation on Undulating Terrain
- In the Special Session on Nonlinear Dynamics with a Focus on Tipping and Resilience, organized by Katherine Slyman and Chris Jones
- **UIUC HADES Seminar Fall 2025** Urbana-Champaign, IL
Radius Selection for Amphiphilic Structures
- **SIAM Dynamical Systems 2025** Denver, CO
Radius Selection for Amphiphilic Structures
- Minisymposium 70 – Spatial Localisation: A Global Perspective on Local Phenomena, Organized by Dan J Hill and Martina Chirilus-Brukner.
- **Argonne National Lab - LANS Seminar** Lemont, IL
Snaking Of 1-dimensional Spirals and Targets
- **Boston University Dynamics Seminar** Boston, MA
Snaking Of Contact Defects
- **SIAM Dynamical Systems 2023** Portland, OR
Snaking Of Contact Defects
- Minisymposium 50 – Singular Perturbation Methods for Multi-Scale Infinite-Dimensional Systems, Organized by Samuel Jelbert and Jan-Eric Sulzbach.
- **BIRS Workshop "Topics in Multiple Timescale Dynamics" 2022** Banff, CA
Snaking Of Contact Defects
- **Brown/BU/UMass Amherst Joint Dynamics and PDE Seminar 2022** Brown University
Snaking Of Contact Defects

- **SIAM Dynamical Systems 2021** **Virtual**
Stability of Traveling Fronts by the Riccati-Evans Function
 - Minisymposium 100 – Wave and Front Dynamics: Propagation and Stability Organized by Paul Carter and Montie Avery
- **SIAM Dynamical Systems 2019** **Snowbird, UT**
Using Geometry to Detect Stability: The Riccati-Evans Function
 - Minisymposium 158: Recent Developments in Dynamics of Localized Patterns Organized by Shin-Ichiro Ei, Takashi Teramoto and Peter van Heijster.
- **AustMS 2018** **Adelaide, Aus**
(Un)Stable (non)physical waves in a model of tumour invasion
 - Special Session for Dynamical Systems and Ergodic Theory Organized by Cecilia Gonzalez-Tokman and Robert Marangell
 - Awarded the AustMS Student Support Scheme which funded my attendance
 - Awarded one of two Honorable Mentions for the Von Neumann Prize given to the best student talk

Contributed Talks.....

- **ANZIAM 2018** **Hobart, Aus**
Neurons, temperature and timescales

Poster Presentations

- **Workshop on Nonlinear Waves, ICERM 2026** **Providence, RI**
Curvature and Confinement: Vegetation on Undulating Terrain
- **MDDLs 2025 Conference at UCI Cellfate Institute** **Irvine, CA**
Curvature and Confinement: Vegetation on Undulating Terrain
 - Awarded prize for best early career poster
- **Random Dynamical Systems with Applications to Biology, NITMB 2024** **Chicago, IL**
Pattern Formation and Dynamical Systems

Conference and Workshop Attendance

- **Nonlinear Waves Workshop**
ICERM April 2026
- **MDDLs 2025 Conference at UCI Cellfate Institute**
Irvine, CA
- **Patterns, Dynamics, and Data in Complex Systems**
ICERM January 2025
- **Random Dynamical Systems with Applications to Biology**
NITMB Nov 2024
- **Equadiff 2019**
Leiden, NL
- **Slow-Fast-ival 2019**
International Centre for Mathematical Sciences, University of Edinburgh
- **Sydney Dynamics Group Workshop 2018**
Sydney, Aus

Mentoring and Supervision

PhD Student Research.....

- Tina Wang** **University of Chicago**
 - *Second Year PhD student in Computational and Applied Mathematics* 2025-2026
 - Co-advised with Mary Silber
 - Paper in preparation

Masters Student Thesis Project.....

- Mike Wang** **University of Chicago**
 - *Masters Student in Computational and Applied Mathematics* 2025-2026
 - Co-advised by Mary Silber
 - Thesis title: Causation Entropy-Guided Discovery of Governing Partial Differential Equations

Undergraduate Research.....

- Ariana Qin** **University of Chicago**
 - *Undergraduate in Computational and Applied Mathematics* 2024-2025
 - Co-advised with Mary Silber
 - Presented Poster at SIAM DS25
- Arjun Sohur** **University of Chicago**
 - *Undergraduate in Computational and Applied Mathematics* 2024-2025
 - Co-advised with Mary Silber
 - Presented Poster at NITMB MathBio Convergence Conference
- Ashley Peake** **Brown University**
 - *Undergraduate REU Project* Summer 2022
 - Co-advised with Björn Sandstede
 - Paper in preparation

Other Undergraduate Mentoring.....

- Directed Reading Program**
 - *Brown University* Fall 2021-Spring 2024
 - 3 students mentored
 - An extracurricular activity that match undergraduate students and graduate students with similar interests to participate in a reading project over the course of a semester. Graduate students are responsible for planning the project and mentoring their undergraduate counterpart, including weekly meetings and assistance producing a written proposal and talk.

Student Research Output

Poster Presentations.....

- NITMB MathBio Convergence Conference**
 - *Arjun Sohur - How rainfall variability impacts vegetation pattern formation in drylands* 2025
 - Joint work with Punit Gandhi and Mary Silber
- SIAM DS25**
 - *Ariana Qin - The Effect of Silencing Noise on Noise-Induced Transitions under Periodic Forcing* 2025
 - Joint work with Mary Silber

Teaching

Course Development.....

CAAM31470 Applied Complex Analysis

- *University of Chicago* *Winter 2024*
 - Independently developed class for upper undergraduates
 - Course introduces students to complex analysis tools useful in applied problems: topics include: analytic functions, contour integration Cauchy Residue calculus, and integrals useful in the theory of Fourier and Laplace transforms

Teaching Experience.....

Independent Instructor

- *University of Chicago* *2025-present*
 - MATH18600 Mathematics of Quantum Mechanics (Winter 2025 and Spring 2026)
 - STAT28200 Dynamical Systems with Applications (Winter 2026)
 - CAAM31470 Applied Complex Analysis (Spring and Fall 2025)

Independent Instructor

- *Brown University* *2022*
 - APMA0350 Applied Ordinary Differential Equations (Summer 2022)

Graduate Teaching Assistant (Tutorials and grading only)

- *Brown University* *2020–2021*
 - APMA0650 Essential Statistics (Spring 2021)
 - APMA0360 Applied Partial Differential Equations I (Fall 2020)

Tutor

- *Sydney University* *2017–2019*
 - MATH2921 Vector Calculus and Differential Equations (Advanced) (Sem 1 2019)
 - MATH3078/MATH3978 Partial Differential Equations and Waves (Normal/Advanced) (Sem 2 2018)
 - MATH1023 Multivariable Calculus and Modeling (Sem 2 2018)
 - MATH2921 Vector Calculus and Differential Equations (Advanced) (Sem 1 2018)
 - MATH1021 Calculus of One Variable (Sem 1 2018)
 - MATH1003 Integral Calculus (Sem 2 2017)
 - MATH1901 Differential Calculus (Advanced) (Sem 1 2017)

Qualifications and Training.....

Sheridan Course Design Seminar

- *Brown University* *Spring 2022*
 - A semester long seminar for grad students and postdocs to learn the essential elements of course design. The seminar focuses on a backwards, student centered design philosophy with discussion of authentic learning outcomes, effective assessment design, active learning and writing pedagogy and syllabus design.

Sheridan Teaching Seminar - Reflective Teaching (Certificate 1)

- *Brown University* *Fall 2020*
 - A semester long seminar designed to develop and refine basic teaching practices and evidence-based teaching skills and strategies. Particular focus is given to critical reflection, inclusivity, rhetorical practice, classroom communication, learning design and active learning strategies.

Service

Peer Review for Academic Journals

- *Including revisions* *Fall 2024-Present*
 - 2 articles for SIADS
 - 1 article for Mathematical Biosciences

Co-organizer of the Computation and Modeling Seminar

- *University of Chicago* *Fall 2024-present*
 - Responsible for seminar speaker organization and moderating feedback for graduate student speakers.

- **Graduate-Faculty Liaison for the Division of Applied Math**
Brown University *Summer 2022-Spring 2024*
- **Society of Industrial and Applied Mathematics - Brown Chapter**
Brown University *Fall 2022-Spring 2024*
 - Served as President 2023-2024.
 - Served as Vice-President 2021-2022.
 - Awarded 2021-2022 SIAM Brown Student Chapter certificate of recognition
 - A community of students, postdocs and faculty interested in applied and interdisciplinary mathematics. I organized professional, academic and social events including latex tutorials, industry and internship panels, lightning talks, and competitions.
- **Organizer of Brown Mathematical Competition for Modeling**
Brown University *Fall 2021 - Spring 2024*
 - A competition for undergraduate students. Students work in small groups to attempt to answer open-ended, real world questions by analyzing data or constructing mathematical models. Winning teams were sponsored to compete in international COMAP MCM competition.
- **Organizer for SIAM Grad Seminar**
Brown University *Fall 2021 - Spring 2024*
 - The SIAM Grad Seminar is seminar series aimed at showcasing graduate research in Brown Applied Math in an informal setting. Each week a grad student gives a talk about their research or just some interesting mathematics. Audience feedback is also moderated by the organizers to provide an opportunity to learn presentation skills and practice conference talks.
- **Organizer Division of Applied Math Directed Reading Program**
Brown University *Spring 2021 - Spring 2024*
 - A graduate-to-undergraduate student mentoring program. Graduate students would suggest small projects for undergraduate students, typically involving understanding a paper or reading a section of a book. Mentees would give a talk at the end of semester to their peers.
 - Responsible for: the application process; matching undergraduates and graduates; organizing social events and final presentations; and, giving feedback for mentors and mentees.
- **Organizer Division of Applied Math Grad Student Retreat**
Brown University *Fall 2022*
 - The Division of Applied Math has a tradition of taking the new incoming graduate cohort on a two day retreat. We provide students with the opportunity to make friends within their cohort and across the Division, learn about the Division and its research, and overall start their Brown experience with a bang.