ERIN BECKMAN

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RESEARCH INTERESTS Interacting Particle Systems, Branching Processes, Probability, Mathematical Biology, Partial Differential Equations

EDUCATION

Duke University *2013–2019*

Ph.D. in Mathematics
Advisor: James Nolen
Dissertation: Asymptotic behavior of certain branching processes

The University of Texas at Austin *2008–2012*

B.S. in Mathematics
B.S. in Chemistry
Undergraduate Thesis: Equilibrium and Non-Equilibrium Molecular Absorption: A study of the Ising model and the infinite parking limit problem
Undergraduate Advisors: John Stanton and Lorenzo Sadun

APPOINTMENTS

Utah State University *Aug. 2022–present*

Assistant Professor, Dept. of Mathematics and Statistics

McGill University *Jan. 2022–July 2022*

Postdoctoral Fellow, Dept. of Mathematics and Statistics

Concordia University *Sept. 2019–Dec. 2020*

Postdoctoral Fellow, Dept. of Mathematics and Statistics

Lone Star Community College *Jan. 2013–May 2013*

Adjunct Faculty, Developmental Math

LEAVE

Parental Care with Modified Duties *Fall 2023*

Maternity Leave *Dec. 2020–Dec. 2021*

Research Activities

PUBLICATIONS AND PREPRINTS

ARTICLES IN SUBMISSION

Chase-escape with conversion as a multiple sclerosis lesion model

Emma Bailey, Erin Beckman, Saraí Hernández-Torres, Matthew Junge, Aanjaneya Kumar, Ann Lee*, Danny Li*, tahda queer*, Alisher Raufov*, Lily Reeves, Omer Rondel*
Submitted to: Electronic Journal of Probability, 2025

The central limit theorem via doubling of variables

Louigi Addario-Berry, Gavin Barill, Erin Beckman, Jessica Lin
Submitted to: Journal of Theoretical Probability, 2025

PEER-REVIEWED PUBLICATIONS

Inferring birth versus death dynamics for ecological interactions in stochastic heterogeneous populations

Erin Beckman, Heyrim Cho, Linh Huynh
Bulletin of Mathematical Biology, Vol. 87, No. 105, 2025

Symmetric cooperative motion in one dimension

Louigi Addario-Berry, Erin Beckman, Jessica Lin
Probability Theory and Related Fields, Vol. 188, 625-666, 2023

Asymmetric cooperative motion in one dimension

Louigi Addario-Berry, Erin Beckman, Jessica Lin
Transactions of the American Mathematical Society, Vol. 375, 2883-2913, 2022

Chase-escape with death on trees

Erin Beckman, Keisha Cook, Nicole Eikmeier, Saraí Hernández-Torres, Matthew Junge
The Annals of Probability, Vol. 49, No. 5, 2530-2547, 2021

The frog model on trees with drift

Erin Beckman, Natalie Frank, Yufeng Jiang*, Matthew Junge, Si Tang
Electronic Communications in Probability, Vol. 24 (paper no. 26): 1-10, 2019

Asymptotic behavior of the Brownian frog model

Erin Beckman, Emily Dinan, Rick Durrett, Ran Huo, Matthew Junge
Electronic Journal of Probability, Vol. 23 (paper no. 104): 1-19, 2018

Block size in Geometric(p)-biased permutations

Irina Cristali*, Vinit Ranjan*, Jake Steinberg*, Erin Beckman, Rick Durrett, Matthew Junge, James Nolen
Electronic Communications in Probability, Vol. 23 (paper no. 80): 1-10, 2018

IN PROGRESS AND PREPARATION

Syndicated Monte Carlo and the evaluation game for model selection

in progress, with Tyler Brough, Marc Dotson, Jacob Gunther, and Logan Haviland

Quantifying the effect of surrogate modeling in seismic fragility assessment

in preparation, with Mohsen Zaker Esteghamati

A McKean-Vlasov type limit for a branching process

in preparation, with Sarah Penington

EXTERNAL FUNDING

PRINCIPAL INVESTIGATOR

Simon's Foundation Travel Support for Mathematicians Grant *Sept 2024-Aug 2029*

Supports travel to and from collaborators for five years for the PI and graduate students or postdocs. Approximately 25% of applications are funded each year.

* denotes undergraduate co-author

TALKS

INVITED TALKS	Coin Flippers Conference at University of Washington	*July 2025*
	University of Utah Stochastics Seminar	*April 2025*
	UNAM Probability Seminar	*October 2024*
	AMS Fall Central Sectional Meeting	*September 2024*
	SIAM Life Sciences Annual Conference	*June 2024*
	Science Unwrapped: Building on Basics Series	*March 2024*
	Weber State University Math Club	*October 2023*
	Stochastic Spatial Dynamics in Biology Workshop	*April 2023*
	MAA Intermountain Section Speaker Program	*March 2023*
	Cornell Probability Seminar	*February 2023*
	University of Utah Mathbio Seminar	*November 2022*
	USU Mathbio Seminar	*September 2022*
	CRM Workshop	*May 2022*
	CUNY City College Colloquium	*March 2022*
	Utah State University Colloquium	*February 2022*
	University of Houston Colloquium	*February 2022*
	Colby College Colloquium	*February 2022*
	Pepperdine University Colloquium	*January 2022*
	Baylor University Colloquium	*December 2021*
	CUNY Probability Seminar	*November 2021*
	Purdue Probability Seminar	*October 2021*
	Northwestern, U. of Minnesota, Lehigh Joint Probability Seminar	*September 2021*
	Spatial Stochastic Processes at OSU Conference	*March 2021*
	CRM Probability Seminar	*September 2019*
	SUMIRFAS Conference at Texas A&M	*July 2019*
CONTRIBUTED TALKS	USU Math 6910 Seminar	*November 2023*
	JMM Contributed Talk in MAA Probability and Statistics Session	*January 2019*
	Duke Graduate-faculty Seminar	*November 2018*
	Duke Probability Seminar	*October 2017*
	Triangle Area Graduate Mathematics Conference	*April 2017*
	Duke Graduate-faculty Seminar	*April 2016*
	North Carolina State Univ., SAMSI IMSM Workshop	*July 2015*
	MBI at Ohio State Univ., Summer Graduate Workshop	*July 2014*

WORKSHOP PARTICIPATION

BIRS Workshop - Emerging Connections between Reaction-Diffusion, Branching Processes, and Biology *May 2025*
Banff, Canada

Stochastic Spatial Dynamics in Biology *April 2023*
Utah State University

AMS Math Research Community Workshop - Stochastic Spatial Models *June 2019*
Whispering Pines Conference Center, Rhode Island

MSRI Graduate Summer School *July 2017*
Cortona, Italy

SAMSI Industrial Math/Stat Modeling Workshop *July 2015*
North Carolina State University

MBI-CAMBAM-NIMBioS Summer Graduate Program *July 2014*
Mathematical Biosciences Institute, Ohio State University

Teaching Activities

TEACHING AND MENTORING

USU TEACHING

M6750 - Probability Theory *Spring 2025*
Designed and given for the first time as a new course

M5810/6810 - Applied Stochastic Processes *Fall 2024*

M6910 DRC - Probability Theory *Summer 2024*

M5810/6810 - Probability Topics in Mathbio *Spring 2023*
Designed and given for the first time as a topics course

M5710 - Introduction to Probability *Fall 2022 & 25, Spring 2024 & 25*

PREVIOUS TEACHING

Linear Algebra and Probability, McGill University *Fall 2020*

Calculus II, McGill University *Winter 2020*

Calculus II, Duke University *Spring 2019*

Intro Calculus II with Applications, Duke University *Fall 2015, 17, & 18*

Elementary Probability, Duke University *Fall 2016*

Lab Calculus and Functions II, Duke University *Fall 2013*
Lab instructor, supporting the instructor of record

Pre-Algebra, Lone Star Community College *Spring 2013*

Introductory Algebra, Lone Star Community College *Spring 2013*

RESEARCH MENTORING

USU STUDENTS

Christiana Asante, PhD Mathematics *Spring 2025–current*

Working on research in the area of branching processes and limit theorems.

Kaleb Crowford, MS Industrial Mathematics *Fall 2024–current*

Working on a project understanding the neutron transport equation, including probability connections, Markov Chain Monte Carlo applications, and nuclear energy applications. Expected graduation in Spring 2026.

Palmer Edholm, undergraduate *Fall 2022–Spring 2023*

Worked on framing and understanding measure-theoretic probability questions related to Humans vs. Zombies game modeling.

PREVIOUS MENTORING

Cégep Supervision Program *Winter 2020*

Developed and mentored two Cégep research projects. Each student summarized and presented their work at the end of the semester.
Cégep is the Québec equivalent of 12th graders and freshmen in college.

Projects mentored:

- Yehia Sabaa (Vanier)
  Proj. Title: Using Markov chains to generate a simply normal number
  - report published in Varnier SIGMA Science Journal
- Philippe Tsoy (Vanier)
  Proj. Title: Code Breaking with Markov Chains

Summer Workshop in Mathematics Instructor *Summer 2019*

Taught a six-lecture minicourse on Markov Chains and designed and mentored four projects for high school women during the nine day workshop.

Projects mentored:

- Code Breaking
- Modeling Epidemics
- Random Walks and Random Motion
- Markov Chains in Biology

DOmath Undergraduate Research *Summer 2017*

Co-mentored three Duke undergraduate students during a two month summer research project. The project resulted in the paper *Block size in Geometric(p)-biased permutations*.

Mathbio RTG Undergraduate Summer Workshop *Summer 2014, 2015, 2017*

For three summers, I developed research project ideas and mentored undergraduate students during a nine day workshop at Duke.

Project Mentored:

- Andrea Carmack (Salisbury University) *Summer 2017*
  Proj. Title: Effects of Random Mutation in Cancer
- Chindu Mohanakumar (University of Florida) *Summer 2015*

and Ruby Kim (Pomona College)
Proj. Title: Modeling Central Sleep Apnea and SIDS

- Demara Austin (St. Mary's College of MD) *Summer 2014*
  Proj. Title: Pharmacology: Using Symmetric Groups to Study Racemic Mixture Drugs

Projects Co-mentored:

- Allison Granger (Allegheny College) *Summer 2017*
  Proj. Title: Mathematically Modeling Ovulation
- Shakuan Frankson (Howard University) *Summer 2017*
  Proj. Title: Type II Diabetes

TEACHING CERTIFICATE

Certificate in College Teaching *Spring 2019*

Duke University
Requirements satisfied:

- Topics and Careers in Higher Education (GS 770) *Fall 2017*
- Peer Review Teaching Triangles program *Fall 2017*
- Teaching College Mathematics (Math 771S) *Fall 2013*

AWARDS

L.P. Smith Award for Teaching Excellence, Duke University *2017–2018*

Awarded for a long-term commitment to teaching and teaching which has reached "a consistent level of excellence".

Service Activities

CURRENT ADVISING

USU PhD Advisor - Christiana Asante *Spring 2025–present*

USU Master's Advisor - Kaleb Crowford *Fall 2024–present*

CURRENT PHD COMMITTEE SERVICE

USU PhD Committee Member - Amanda Wijesinghe *Fall 2025 –present*

USU PhD Committee Member - Mati Avellaneda *Spring 2025–present*

USU PhD Committee Member - Tom Jensen *Spring 2025–present*

USU PhD Committee Member - Shivalinga Baddipalli *Fall 2024–present*

USU PhD Committee Member - Jace Ritchie *Spring 2024–present*

USU PhD Committee Member - Shaveen Britto *Spring 2024–present*

USU PhD Committee Member - Bernard Afful *Spring 2024–present*

CURRENT MASTER'S COMMITTEE SERVICE

USU Master's Committee Member - Gabe Tonks *Spring 2025–current*

PAST MASTER'S/PHD COMMITTEE SERVICE

- Asher Hanson - MS, 2024
- Kevin Roberts - MS, 2025
- Haley Burger - MS, 2025
- Dana Strong - MS, 2025

OTHER SERVICE ACTIVITIES

Journal Article Referee

I have reviewed journal articles for the Electronic Journal of Probability, Electronic Communications in Probability, and Applied Probability Journals.

Grant Reviewer

I have reviewed grants for the Simons Foundation.

Mathematical Reviewer

I review articles for the Mathematical Reviews database, organized by the American Mathematical Society.

Applied Mathbio Group Seminar Organizer *January 2024–present*

USU Applied Math Search Committee Member *Fall 2024–Spring 2025*

Math 6810 Guest Lecturer *November 2024*

USU Department of Math and Stats Grad School Panelist *November 2024*

USU College of Science JEDI Collaboratory Member *2022–2024*

USU Statistics/Data Science Search Committee Member *2022–2023*

USU College of Science Women in STEM Panelist *February 2023*

Association for Women in Mathematics Panelist *February 2023*

NSF Probability Grant Panel Reviewer *2022*

JMM MRC Special Session Organizer *January 2020*

With two co-organizers, we decided on and organized the speaker line up for the session to complement the summer Math Research Community experience.

Duke Mathbio RTG Summer Workship Organizer *Summer 2017*

I was a member of the selection committee, organized visitor information for students, and acted as contact point for students before arrival.