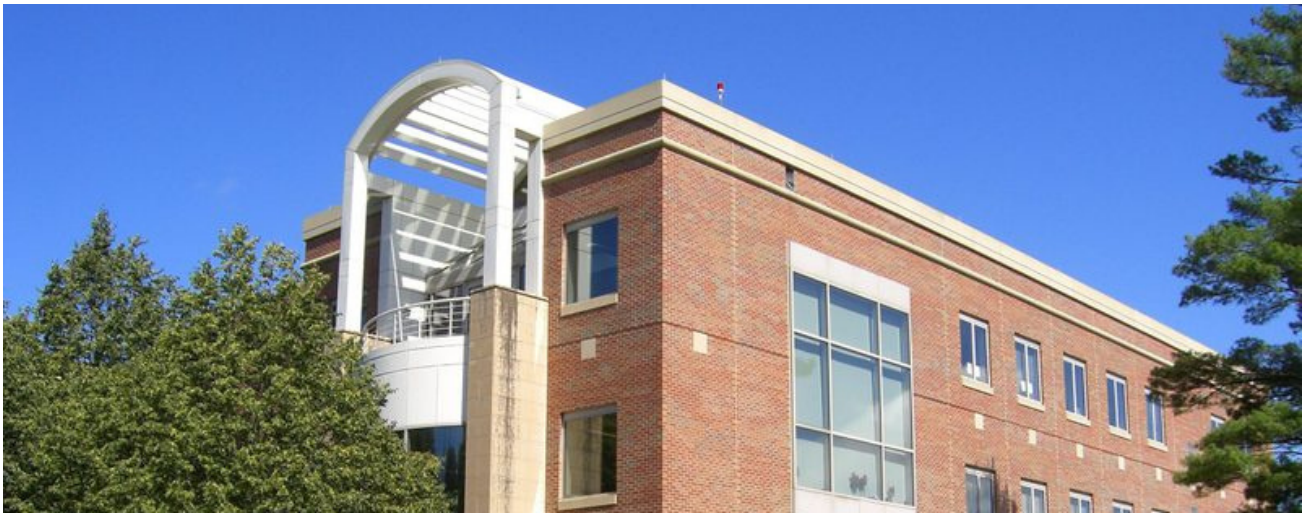
OCTOBER 13, 2023 VOL. 42, NO. 3

GOODSELL GAZETTE



Math and Stats Colloquium

Speaker: Jasper Weinburd (Hamline University)
Date: Tuesday, October 17, 2023 (Week 6)
Time: 4-5 pm
Where: CMC 206

Title: Collective Behavior in Locust Swarms from Differential Equations to Data
Abstract: Locusts are devastating pests that infest and destroy crops. Locusts forage and migrate in large swarms which exhibit distinctive shapes that improve efficiency on the group level, a phenomenon known as collective behavior. One of the difficulties in understanding and preventing these collective behaviors has been a lack of biological data for individual interactions between locusts. In this talk, I'll first describe mathematical models for these phenomena on both the collective and individual levels. I'll then discuss a collaboration with undergraduate students that use field data derived from video footage of locust swarms. We digitized nearly 20,000 locust trajectories and revealed individual behaviors that depend on a locust's motion and the relative position of its nearby neighbors. Finally, I will illustrate the challenges and potential benefits of incorporating these field observations into our models of locust swarms.

IN THIS ISSUE

Welcome New Visiting Professors

Mike Adams
Visiting Professor of Mathematics

Tell us a bit about your journey to becoming a mathematician. What is your area of expertise? I started college thinking that I would major in chemistry or engineering, but fell in love with math when my calculus professor gave me a combinatorial problem to work on over Christmas break and I was able to solve it. Although my master's thesis was in the area of partial differential equations, I eventually did my PhD in combinatorics. Over the years I've done research in coding theory, mathematical biology, and game theory.

What advice would you share with a student? My recommendation to students is to study broadly; there are wonderful, interdisciplinary problems out there!

What are your hobbies? In my spare time (rare these days), I love to hike, cook, and read.

Corey Brooke
Visiting Assistant Professor of Mathematics

Tell us a bit about your journey to becoming a mathematician. What is your area of expertise? I have always been interested in math because I love thinking about hard problems with other people. In precalculus, I had so much fun learning how to graph circles, ellipses, hyperbolas, and other shapes—it's astonishing how much geometric information about a graph you can find by manipulating its defining equation algebraically. Many years after precalculus, I started studying algebraic geometry, a field that studies systems of polynomial equations (in however many variables) by considering geometric properties of the solution set. For this, I use tools from abstract algebra, projective geometry, and number theory.

What advice would you share with a student? Advice I have for math students is to learn basics from a lot of mathematical fields, especially while at a place like Carleton where faculty with many different research interests are excited to tell you what they do! Whatever math you learn, you will use, whether in your own projects or in interacting with future colleagues.

What are your hobbies? When I'm not on campus, I enjoy getting out in nature and learning about plants. My favorite environments are bogs, fens, and mires, where you can often find bizarre members of the heather and orchid families. In Oregon, where I'm from, I've documented over 750 native plant species in the wild!

Rebecca Terry
Visiting Assistant Professor of Mathematics

Tell us a bit about your journey to becoming a mathematician. What is your area of expertise? As an undergraduate student at a liberal arts institution, I majored in Environmental Studies with a focus in Economics. This degree enabled me to explore environmental issues through a variety of disciplinary lenses across the sciences, social sciences and humanities. After graduation, I worked as a research assistant in the field of environmental economics. During that time, it seemed to me like different decision-makers utilized different mathematical models to support their chosen policies, and there was a lot of criticism associated with different models. I decided that if we needed better models to better inform environmental policy, then I needed to learn more math. I started auditing math classes where I fell in love with the beauty of mathematical theory and the power of applied mathematics. I participated in a post-baccalaureate program for women in mathematics at Smith College where I had the opportunity to participate in research projects and make connections with a supportive network of mathematicians. I went on earn my PhD in mathematics through the University of Utah where I studied mathematical biology. I get really excited about applying math in different ways and enjoy collaborating with people in different fields. I also strive to make math accessible, and one of my teaching goals is to empower students with the mathematical skills they need to pursue their chosen fields of study. My research interests include dynamical systems, perturbation analysis, mathematical biology and modeling.

What advice would you share with a student? Ask questions of your professors and peers both in and outside of class. Your professors are enthusiastic about their fields of study and want to support you in achieving your educational goals. Form study groups. We all have different mathematical backgrounds, experiences and strengths. We grow in our understanding when we consider a problem from different perspectives.

What are your hobbies? My hobbies include hiking, skiing, and canoeing/kayaking. I also enjoy playing the piano, singing in choral groups, reading mysteries and solving puzzles: jigsaw, number, crossword, etc.

Faculty KUDOS

Claudio Gómez-Gonzáles, Assistant Professor of Mathematics, recently joined the editorial board of **MAA FOCUS**, the newsmagazine of the Mathematical Association of America, which "contains information about MAA activities, news from the mathematical community, and thought-provoking articles about mathematics, mathematics education, and related areas." (See the magazine's landing page here.) ***Congratulations, Claudio!***

Summer Activities Panel

What: Summer Activities Panel
When: Tuesday Oct 24, 4pm
Where: CMC 206

As the weather gets cold and the leaves are falling...are you thinking about summer? Do you want to find the perfect summer activity to expand and enhance your math or stats studies? Join us for a student panel on summer activities! Math and Stats students will discuss their research and internship experiences, and answer your questions.

MAST Lunch Table

YOU are invited to the MAST Lunch Table on **Tuesdays 12-1pm in the Sevy Tea Room** (the small room off the Sevy side of Burton dining hall)! Join us if you want to hang out with your math and stats friends, meet more math and stats enthusiasts, chat about mathematical and statistical goings-on, or even chat about non-math and stats topics in a lovely math- and stats-tinged ambience.

Join Algebra Club!

Do you want to learn more math in a friendly setting? Do you have a math topic you are passionate about that you want to teach to others? Do you like to eat cookies? Consider coming to Algebra Club! Algebra Club is an unofficial student-run club dedicated to learning cool math as a group. We meet **every Thursday 8:00-9:00 pm in CMC 328**. Most meetings consist of a lecture by one of your fellow students, but we have also been known to work on fun problems or watch a neat video together. If you have any questions, would like to join the mailing list, or are so excited that you would like to contribute a talk, feel free to contact Annemily Hoganson (hogansona@carleton.edu). We look forward to seeing you!

NCUWM 2024

The **Nebraska Conference for Undergraduate Women in Mathematics** is an annual conference held in Lincoln, Nebraska that provides "role models, insider knowledge, opportunities to present undergraduate research, and a growing community of peers interested in issues related to creating a supportive environment for women in mathematics."

Registration is open from now until **November 17**, and **GeMMS will fund expenses** for Carleton students who are accepted to the conference. Students can apply to give a talk or a poster, or just attend. Note: when registering, students should select the option that their college will pay the registration fee, and that they should pay "via invoice" at the final step. Contact MurphyKate Montee at mmontee@carleton.edu if you have any questions.

Jobs, Internships, and Other Opportunities

Jobs

Research Assistant
Federal Reserve Bank of Chicago. Due Saturday, October 14
*For more information, please visit the Carleton Career Center!

Internships

NSA Summer Internship - STEM (Maryland, 2024 Summer)
National Security Agency (NSA). Due Saturday, October 14

Carl Connection: Global Network Planning & Alliances – Intern (Summer 2024)

Position: Intern (Summer 2024)
United Airlines, apply as soon as possible
Note: This opportunity is brought to you by a Carleton alumnus, Zhuoli Zhang '21. You are welcome to reach out to Zhuoli at zhuoli.zhang@united.com with any questions about the organization or position prior to applying.

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