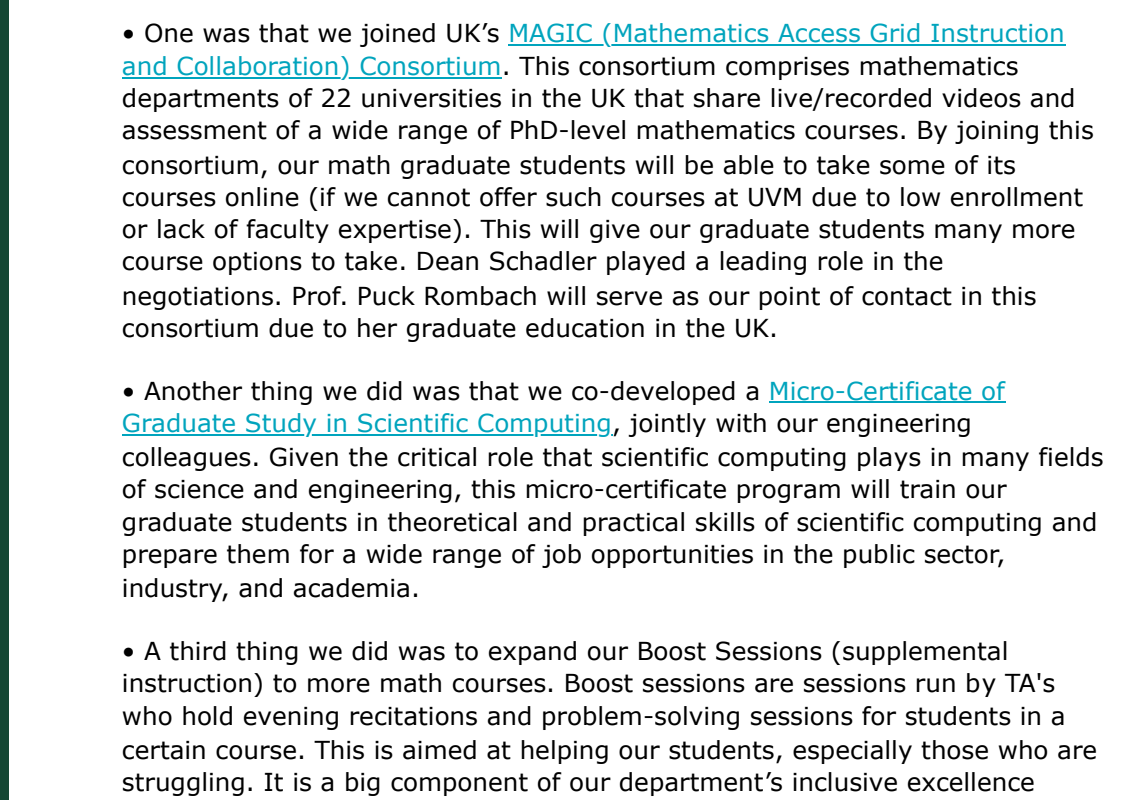




## Mathematics and Statistics

### Fall 2024 Newsletter



### A Note from the Chair

Dear friends of UVM Math/Stat,

I hope this note finds you well. It has been another exciting year for the Department. Prof. Chris Danforth won the University Scholar Award, Senior Lecturer Krisan Geary won the CEMS Professional Service Award, and Prof. Taylor Dupuy and Sean-Gabriel Young won NSF grant awards. In addition, Prof. Jim Bagrow wrote a monograph on network data analysis (published by Cambridge University Press), and I also wrote a monograph on rogue waves (published by Springer).

In the past year, the Department did many things.

- One was that we joined UK's [MAGIC \(Mathematics Access Grid Instruction and Collaboration\) Consortium](#). This consortium comprises mathematics departments of 22 universities in the UK that share live/recorded videos and assessment of a wide range of PhD-level mathematics courses. By joining this consortium, our math graduate students will be able to take some of its courses online (if we cannot offer such courses at UVM due to low enrollment or lack of faculty expertise). This will give our graduate students many more course options to take. Dean Schudler played a leading role in these negotiations. Prof. Puck Rombach will serve as our point of contact in this consortium due to her graduate education in the UK.

- Another thing we did was that we co-developed a [Micro-Certificate of Graduate Study in Scientific Computing](#), jointly with our engineering colleagues. Given the critical role that scientific computing plays in many fields of science and engineering, this micro-certificate program will train our graduate students in theoretical and practical skills of scientific computing and prepare them for a wide range of job opportunities in the public sector, industry, and academia.

- A third thing we did was to expand our Boost Sessions (supplemental instruction) to more math courses. Boost sessions are sessions run by TA's who hold evening recitations and problem-solving sessions for students in a certain course. This is aimed at helping our students, especially those who are struggling. It is a big component of our department's inclusive excellence strategy. We hope it will help reduce the DFW rates (students who get D, F or W grades) of our math courses and help with student retention. Last year, we piloted our Boost Sessions in Math 1212 (Fundamentals of Calculus I) and Math 1234 (Calculus I). This year, we have expanded it to three more courses: Math 1224 (Fundamentals of Calculus II), Math 1248 (Calculus II) and Math 2248 (Calculus III). Senior Lecturer Rosi Rosebush is organizing our Boost Sessions.

We have two upcoming retirements. Prof. Mike Wilson and Daniel Bentil will retire at the end of this year. They have worked in the department for a very long time and made many valuable contributions. It is truly a loss to the department when they retire. In addition, Senior Lecturer Laura Marthaler moved from our department to the Computer Science department at UVM. It is a sad day for Differential Equations, but she will still be around! Following these retirements in off-campus departments, we have been given permission to hire new TT faculty and lecturers. Two search committees (one for TT and the other for lecturer) have been formed and they are screening candidates right now.

In the past year, the College implemented a new admin structure. In the old structure, each department had its own dedicated admin(s), who handled a wide range of tasks. Now, departments share admins, each of whom performs a narrower range of tasks for multiple departments. For example, Elijah Coolidge now provides general operational support to math/stat, computer science and physics (by the way, the Physics Department moved from the College of Arts and Science to our college last year).

The University's leadership is currently under transition. Following President Suresh Garmire's departure, Provost Prelock is now Interim President, and Dean Schudler is now Acting Provost. The University is searching for a new president right now.

This newsletter will share more of our activities in teaching, research, and service.

I hope you enjoy this newsletter on what is happening in the Department, and on the successes of our faculty and students. Please keep us updated with your own exciting news (you can write to me, [jxvango@uvm.edu](mailto:jxvango@uvm.edu), or to the Department, [mathstat@uvm.edu](mailto:mathstat@uvm.edu)).

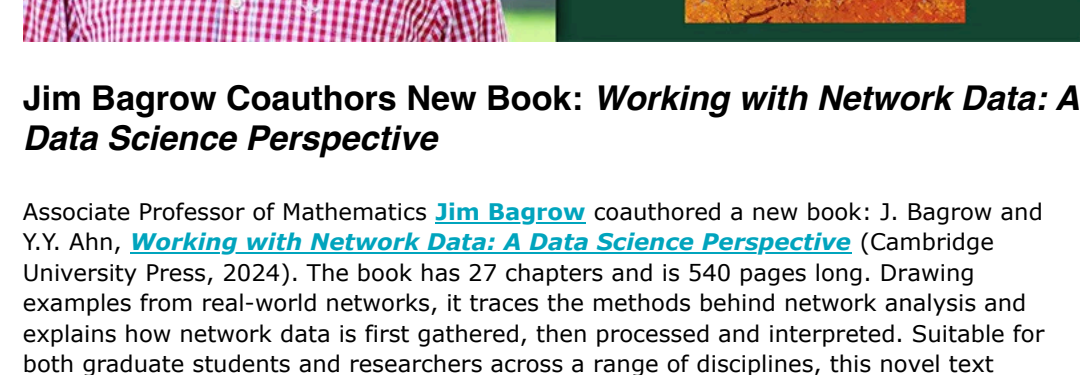
Warm regards and happy holidays,  
**Jianke (Jackie) Yang**  
 Professor and Chair  
 Department of Mathematics and Statistics

### Awards



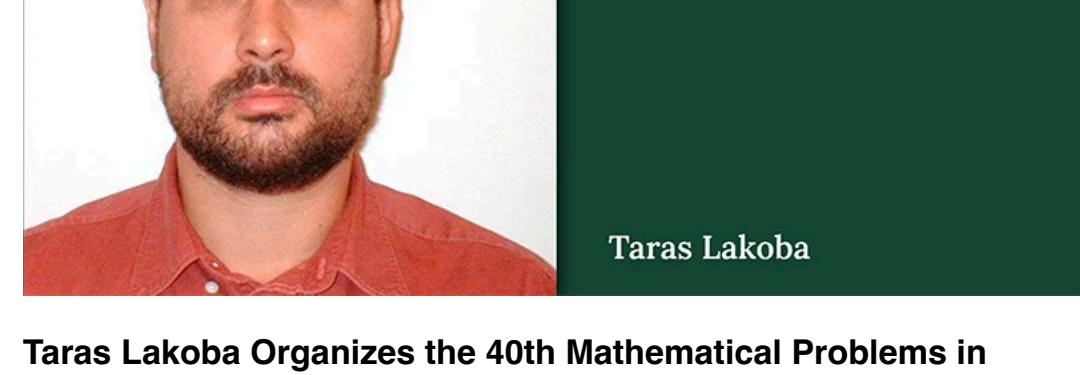
#### Chris Danforth Named 2024 University Scholar

Professor of Mathematics **Chris Danforth** was named a **2024 University Scholar**. This award, presented annually, honors and recognizes distinguished UVM faculty members for sustained excellence in research, creative and scholarly activities. Chris received this award for his internationally recognized work in complex systems, the intersection between human behavior and social media. He is the co-inventor of the "hedonometer," which gathers tweets on X (formerly Twitter) to sample the mood of the world population. Such extensive data analysis has organizations like Gallup and The Economist asking his advice on issues of the day. His over 110 publications have been cited over 8,000 times and Chris is featured in popular media. He has been awarded the Kroepsch-Maurice Teaching Award and supervised many graduate students.



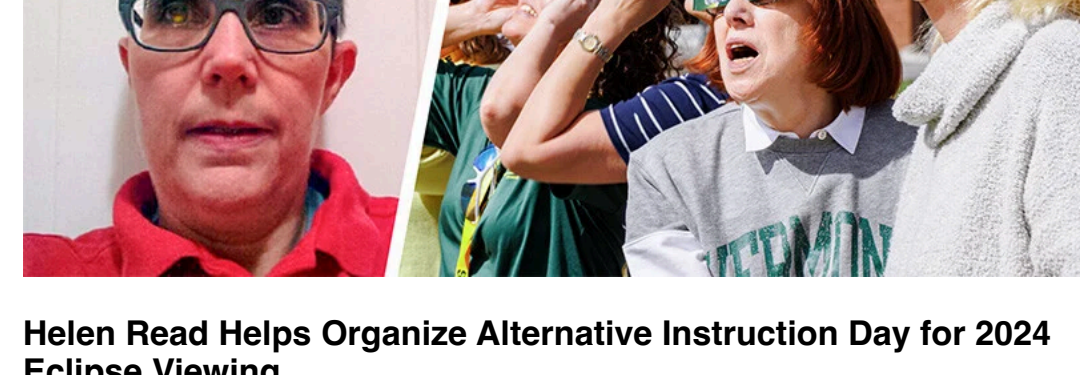
#### Krisan Geary Received CEMS 2024 Professional Service Award

Senior Lecturer of Mathematics **Krisan Geary** won **CEMS 2024 Professional Service Award**. This award is given to a faculty member who has done outstanding service for the College or Community. As the Vermont State MathCounts Coordinator, Krisan coordinates both regional and statewide competitions. Her enthusiasm and dedication to the program is inspiring. One parent wrote: "I wanted to thank you for doing such a great job with it, not just this weekend but with the MathCounts initiative in general... I am witnessing first-hand what a huge positive impact this competition has on families and kids in Vermont..."



Ph.D. student of Mathematics **Sarah Days-Merrill** was named **2023-2024 Graduate Teaching Assistant of the Year** in the Lecture Instruction Category. This annual award recognizes a graduate teaching assistant who has demonstrated unusual excellence and creativity in their teaching and commitment to student learning. Sarah's teaching philosophy is centered on the belief that everyone can learn and succeed in a math course at every level. Sarah strives to make math fun and exciting in a positivity-filled classroom.

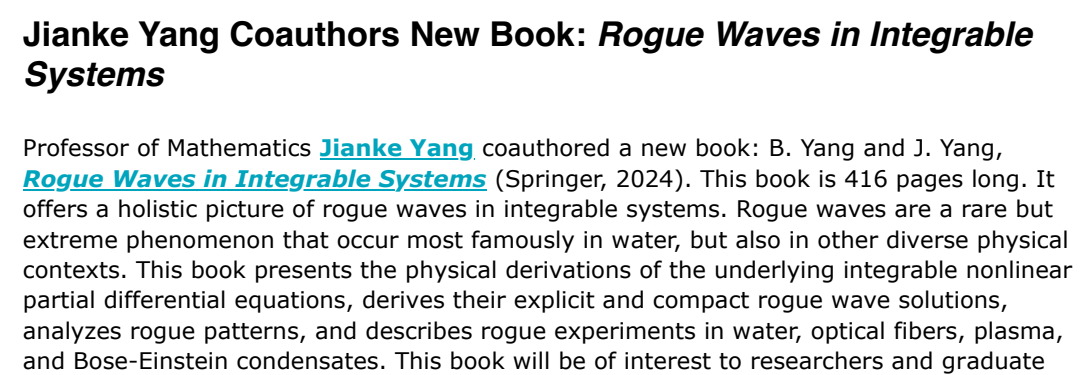
### Promotions



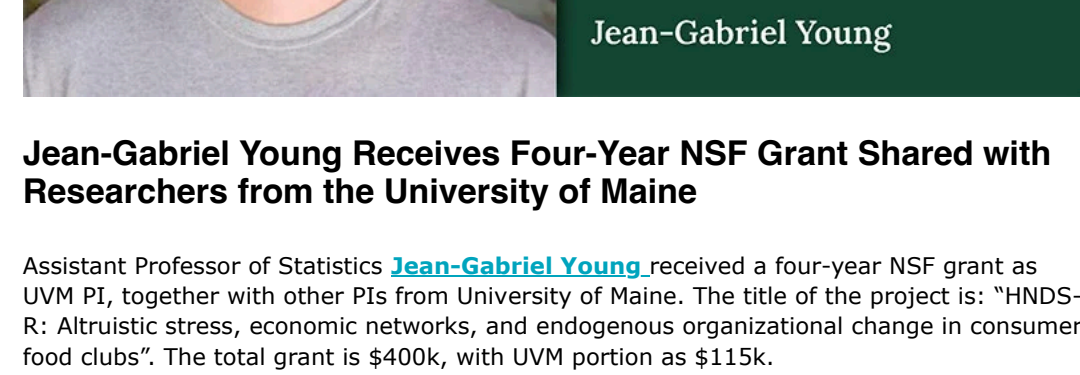
#### Erika Edwards Promoted to Research Professor of Statistics

Congratulations to **Erika Edwards** for promotion from Research Associate Professor of Statistics to Research Full Professor of Statistics. Erika has been very prolific in high-impact journal publications. In addition, she has been serving as Chief Scientific Officer as the Director of Data Science at Vermont Oxford Network with key responsibilities, such as overseeing its database and reporting.

### Faculty News

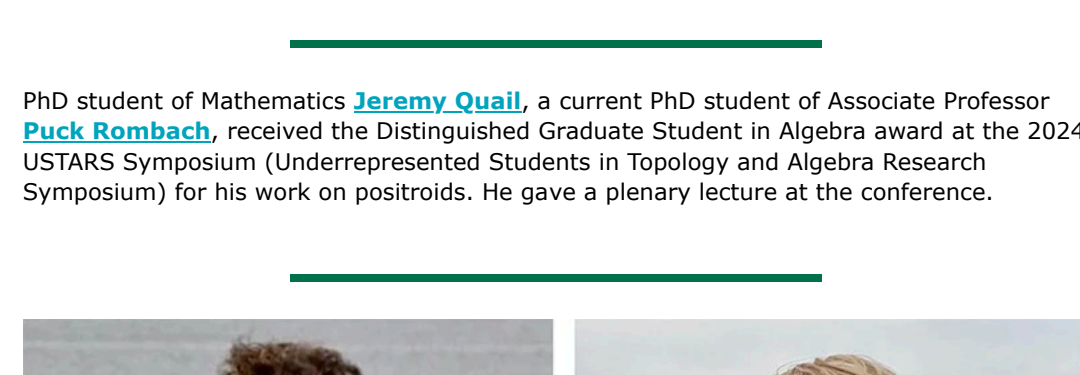


Associate Professor of Mathematics **Jim Bagrow** coauthored a new book: J. Bagrow and Y.Y. Ahn, *Working with Network Data: A Data Science Perspective* (Cambridge University Press, 2024). The book has 27 chapters and is 540 pages long. Drawing examples from real-world networks, it traces the methods behind network analysis and explains how network data is first gathered, then processed and interpreted. Suitable for both graduate students and researchers across a range of disciplines, this novel text provides a fast-track to network data expertise.



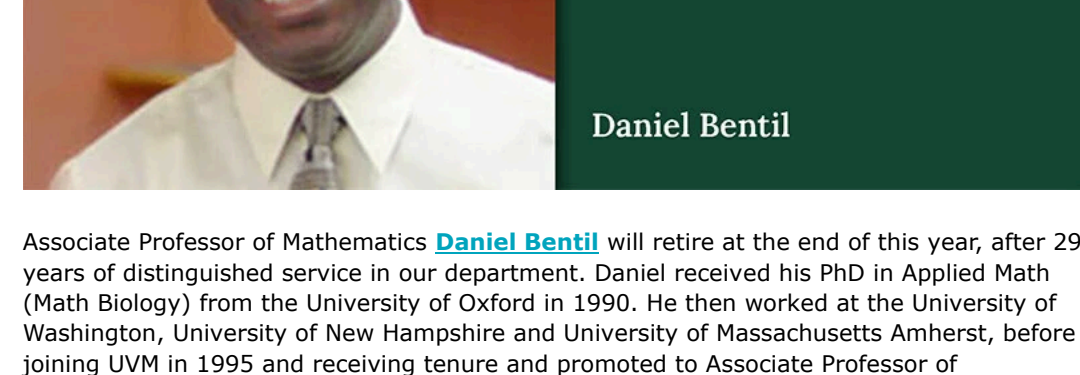
#### Taylor Dupuy Receives 3-year, \$220K NSF Grant

Assistant Professor of Mathematics **Taylor Dupuy** received a new NSF three-year research grant totaling \$220K on a project titled "Intersecting the study for Differential Equations". The grant period is from June 1, 2024 to May 31, 2027. This competitive grant testifies to Dr. Dupuy's research reputation as an algebra and number theory expert.



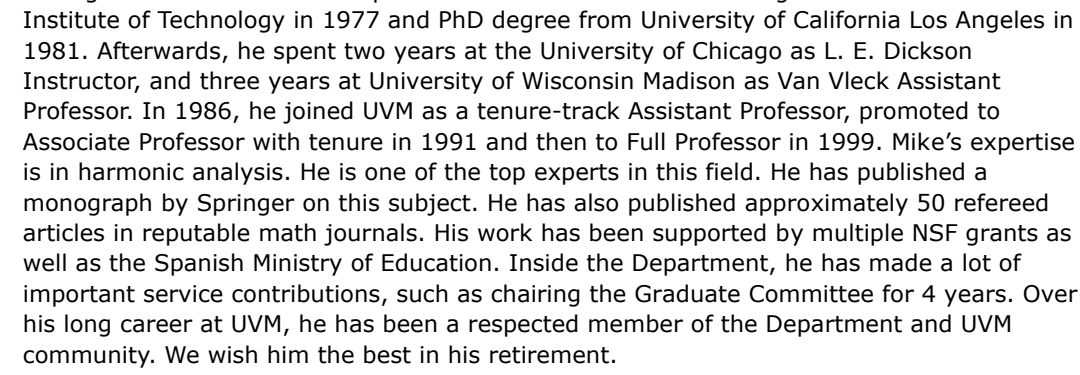
#### Taras Lakoba Organizes the 40th Mathematical Problems in Industry Workshop

Professor of Mathematics **Taras Lakoba** organized the 40th Mathematical Problems in Industry Workshop (MPI) at UVM from June 25 – 29, 2024. Over 50 people (faculty, postdocs, graduate students and industry representatives) attended this workshop and worked on four problems from the industry. Three of the participants are graduate students from our department with the workshop is a yearly event for participating industries, Society of Industrial and Applied Mathematics (SIAM), and local organizers. Throughout this five-day workshop, engineers and scientists from industry and national labs introduced problems that were relevant to their organizations and interacted with the academic participants to generate ideas and prepare the data to a wide range of job opportunities in the public sector, industry and academia. Participants benefited from numerous opportunities to interact, network, and share their respective experiences.



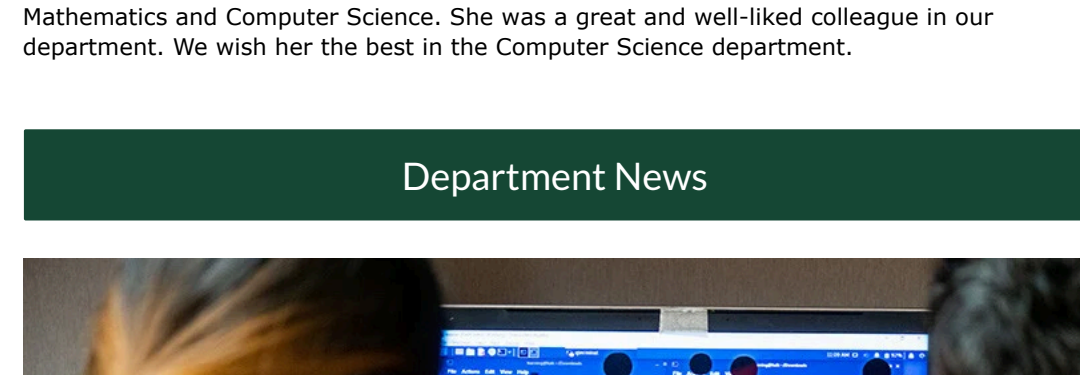
#### Helen Read Helps Organize Alternative Instruction Day for 2024 Eclipse Viewing

Senior Lecturer and Vice Chair **Helen Read** helped organize the campus wide Alternative Instruction Day that allowed the campus community to enjoy and observe the total solar eclipse on April 8, 2024. Helen spearheaded a proposal (along with colleagues Chip Cole and Ellen Brennan from the Vermont Space Grant Consortium, and Physics Lecturer Luke Danforth) to cancel the day of classes and provide alternative activities leading up to the eclipse, and served on eclipse planning committee.



#### Jianke Yang Coauthors New Book: *Rogue Waves in Integrable Systems*

Professor of Mathematics **Jianke Yang** coauthored a new book: B. Yang and J. Yang, *Rogue Waves in Integrable Systems* (Springer, 2024). This book is 416 pages long. It depicts a holistic picture of rogue waves in integrable systems. Rogue waves are a rare but extreme phenomenon that occur most famously in water, but also in other diverse physical contexts. This book presents the physical derivations of the underlying integrable nonlinear partial differential equations, derives their solutions, and explores their applications in analyzing rogue wave patterns, and describes rogue wave experiments in water, optical fibers, plasma, and Bose-Einstein condensates. This book will be of interest to researchers and graduate students in physics and applied mathematics who encounter nonlinear waves.



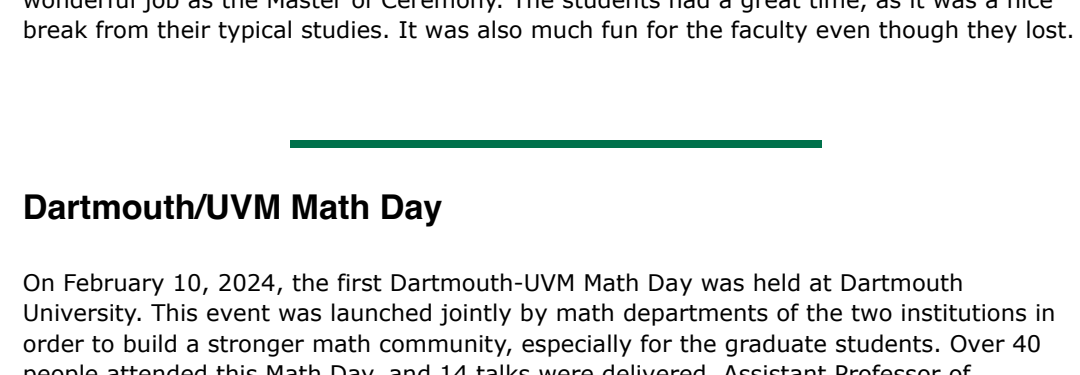
#### Jean-Gabriel Young Receives Four-Year NSF Grant Shared with Researchers from the University of Maine

Assistant Professor of Statistics **Jean-Gabriel Young** received a four-year NSF grant as UVM PI, together with other PIs from University of Maine. The title of the project is: "HNDS-R: Altruistic stress, economic networks, and endogenous organizational change in consumer food clubs". The total grant is \$400K, with UVM portion as \$115K.

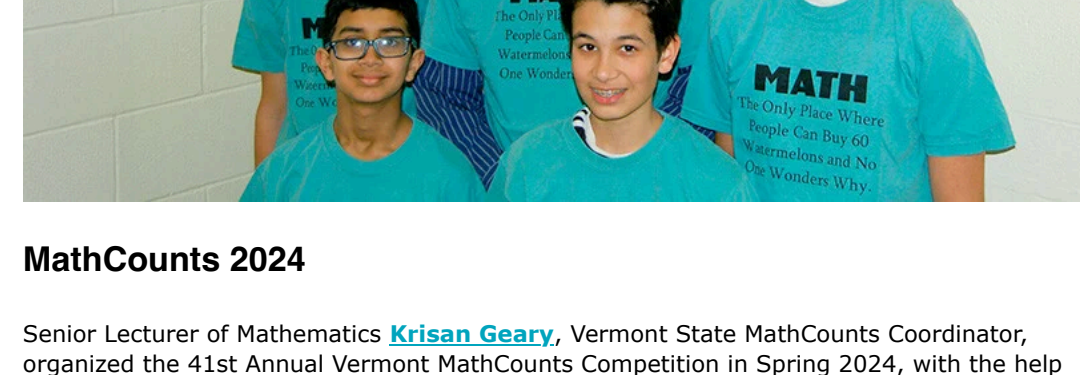
### Student News



PhD student of Mathematics **Sarah Days-Merrill** (advised by Associate Professor **Christelle Vincent**) successfully defended her thesis on March 8, 2024. Her thesis was titled "Ring Learning with Errors". In Fall 2024, Sarah started a lectureship in the Mathematics Department at Yale University.

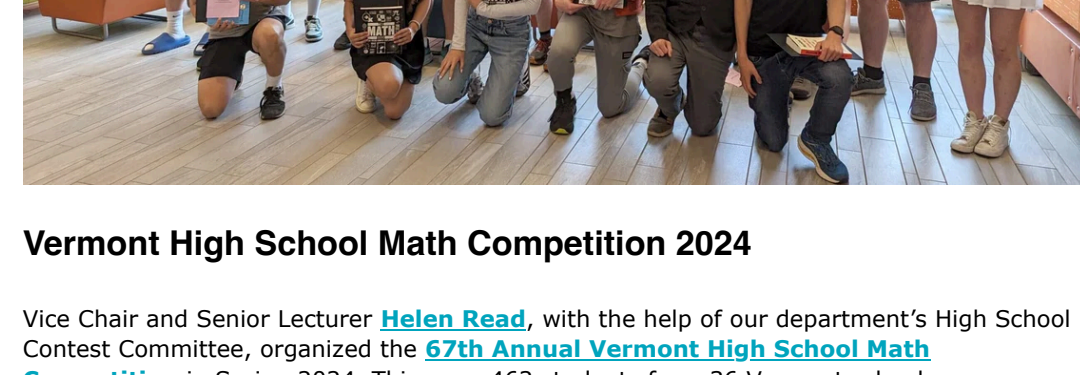


PhD student of Mathematics **Jeremy Quail**, a current PhD student of Associate Professor **Puck Rombach**, received the Distinguished Graduate Student in Algebra award at the 2024 USARMS Symposium (Underrepresented Students in Topology and Algebra Research Symposium) for his work on positrroids. He gave a plenary lecture at the conference.



PhD students of Mathematics **Calum Buchanan**, **Jeremy Quail**, and **Keith Sullivan** (supervised by Associate Professor Puck Rombach and Professor Gregg Warrington) were awarded **VTSOC (Vermont Space Grant Consortium) Graduate Fellowship** for the academic year 2024-25. In addition, Keith did an internship at NASA in the summer of 2024.

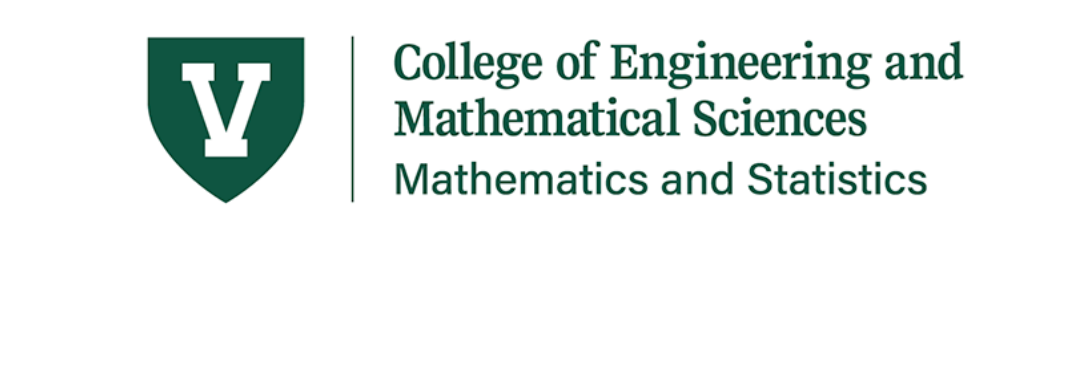
### Retirements and Faculty Departures



Associate Professor of Mathematics **Daniel Bentil** will retire at the end of this year, after 29 years of distinguished service in our department. Daniel received his PhD in Applied Math (Math Biology) from the University of Oxford in 1990. He then worked at the University of Washington, University of New Hampshire and University of Massachusetts Amherst, before joining UVM in 1995 and receiving tenure and promoted to Associate Professor of Mathematics in 1998. Daniel worked in biomathematics and published many papers in this area. He also received research grants from NSF, NIH, and DOE, including the prestigious NSF Career Award. In addition, he was a Fulbright Scholar, Carnegie African Diaspora Fellow and a Commonwealth Scholar. He supervised many PhD students at UVM. He also worked closely with the mathematics colleagues at the University of Wisconsin-Madison and Ghana's institutions. Daniel was also a good teacher and a conscientious department citizen and contributed a lot of important service to the Department. He will be dearly missed.



Professor of Mathematics **Mike Wilson** will retire at the end of this year, after 38 years of distinguished service in our department. Mike received his B.S. degree from California Institute of Technology in 1977 and PhD degree from University of California Los Angeles in 1981. Afterwards, he spent two years at the University of Chicago as L. E. Dickson Instructor, and three years at University of Wisconsin-Madison as Van Vleck Assistant Professor. In 1986, he joined UVM as a tenure-track Assistant Professor, promoted to Associate Professor with tenure in 1991 and then to Full Professor in 1999. Mike's expertise in mathematical analysis. He is one of the top experts in this possible solutions. Part of a monograph by Springer on this subject. He has also published approximately 50 refereed articles in reputable mathematics journals. His work has been supported by multiple NSF grants as well as the Spanish Ministry of Education. Inside the Department, he has made a lot of important service contributions to the faculty by a score of 15 to 12. Neither team over his long career at UVM, he has been a respected member of the Department and UVM community. We wish him the best in his retirement.



Senior Lecturer of Mathematics **Laura Marthaler**, left the department and moved to the Computer Science Department at UVM starting Fall 2024. Laura holds MS degrees in both Mathematics and Computer Science. She was a great and well-liked colleague in our department. We wish her the best in the Computer Science department.

### Department News



#### Micro-Certificate of Graduate Study in Scientific Computing in our Department

In an effort to enhance training on scientific computing skills to graduate students in our department (as well as in other departments) and prepare them to a wide range of job opportunities in the public sector, industry and academia, Professor of Mathematics **Jianke Yang**, jointly with Professor of Mechanical Engineering **Jeff Marshall** and Professor of Civil and Environmental Engineering **Georgia Pinder**, developed a [Micro-Certificate of Graduate Study in Scientific Computing](#). Students completing this program are expected to acquire in-depth knowledge of numerical methods for scientific computing, their implementations (including coding), and their applications to real-world problems in science and engineering. This micro-certificate program started running in Fall 2024 and is open to all graduate students in applied mathematics, engineering and other fields.



#### Math Bee Contest

On Nov. 19, 2024, 25 students competed against a small but feisty faculty team made up of Lecturer **Jeff Jewell** and Professor **Jianke Yang** in a Math Bee Contest. It came down to the final question with the students leading the faculty by a score of 15 to 12. Neither team answered the final question correctly, but due to the final bids (i.e. Jeopardy style rules), the students came out on top with a score of 11 to 0. Thanks go to Math Club Committee Chair Jeff Jewell for arranging this event, and to Senior Lecturer **Jon Kudrins** for doing a wonderful job as the Master of Ceremony. The students had a great time, as it was a nice break from their typical studies. It was also much fun for the faculty even though they lost.

#### Dartmouth/UVM Math Day

On February 10, 2024, the first Dartmouth-UVM Math Day was held at Dartmouth University. This event was launched jointly by math departments of the two institutions in order to build a stronger math community, especially for the graduate students. Over 40 people attended this Math Day, and 14 talks were delivered. Assistant Professor of Mathematics **Spencer Backman** delivered one of the two plenary talks.



#### Math Club Students Attending HRUMC Conference

On April 8, 2024, seven students from **Math Club** (pictured above) attended the Hudson River Undergraduate Mathematics Conference (HRUMC) in Keene, New Hampshire. The students had a great time at the conference. In addition, they got to see the solar eclipse there.

Please email [mathstat@uvm.edu](mailto:mathstat@uvm.edu) with your latest achievements so we may consider including them in the next newsletter. We want to hear from you!



**College of Engineering and Mathematical Sciences**  
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