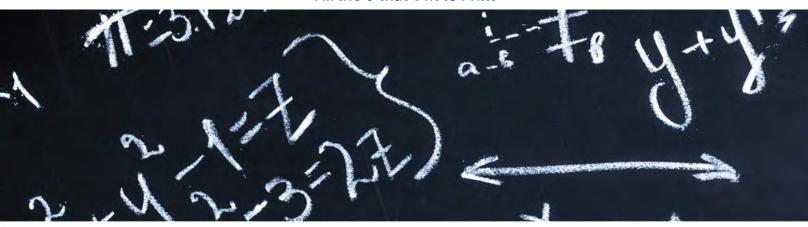>>> 2023 NEWSLETTER <<<

UCCS MATH

All the *V* that's fit to Print

LAS OUTSTANDING STUDENT AWARDS CEREMONY >>>

>>> LORCH SCHOLARSHIP

The family of former UCCS Professors Bob and Barbara Lorch established the Robert S. and Barbara R. Lorch Department of Mathematics Endowed Scholarship in 2009. The late Drs. Lorch taught political science and sociology, respectively, at UCCS for more than 30 years. Bob and Barbara's son John earned a B.A. degree in Math at UCCS in 1988, went on to earn his Ph.D. in mathematics, and is now a Professor of Mathematics at Ball State University in Indiana.

The funding provides for merit-based scholarships for junior or senior math majors. Student **Ann Krbacek** is the 2023/2024 Lorch Memorial Scholarship Recipient. Congratuations to Ann!

During the Spring and Summer/Fall LAS Awards Ceremonies, the following Mathematics students were honored for their academic achievements during 2023 by the College of Letters, Arts and Sciences.

MATH OUTSTANDING STUDENTS:
- JACK BRETT, B.S.
- JONATHAN HITT, B.S.
- ABIGAIL RIGGS, B.S.
- TROY JOHNSON, M.S.

CLASS OF 2023

CONGRATULATIONS TO ALL THE MATH PROGRAM GRADUATES IN 2023

CONGRATULATIONS!

>>> GRADUATE STUDENTS

- **TROY JOHNSON***
  - *OUTSTANDING GRADUATE STUDENT OF THE YEAR
- **STEPHANIE KLUMP**

>>> Bachelor of Science in Mathematics

- MARYAM ALABBAD
- DEREK DOROUGH
- ANDERS RHYS FREY
- ANNIKA GRACE MOTE
- KATHARINE GRACE OGRODNY
- ALEXANDER NICHOLAS RAHN
- SAMANTHA KAYE TURNER
- ALISSA MICHELLE WHITESELL

- GABRIELLA MARIE ANSLEY
- JACK CONNOR BRETT
- NOAH WELLS CARNER
- AVERY TATIANA CLAY
- ADELE SARAH GRIFFIN
- ZANE DRESDEN HALL
- JONATHAN DOUGLAS HITT
- ZOE OLIVIA HOEPFINGER
- SPENCER GIL KIDD
- ANNIKA GRACE MOTE
- FELIX QUALLS
- BENJAMIN JOSEPH RANDALL
- SEAN REDINGER
- BRYNN JOHNSON REILLY
- ABIGAIL ARRAN RIGGS
- AIDAN STEN ROONEY
- RACHAEL MEI LI VERHOEFF
- ELIJAH BRADFORD WARNICK
- WILLIAM C. YOUNG
- JESSICA ZEAS

DEPARTMENT UPDATES

>>> GENE ABRAMS

Gene Abrams' 2023 was a good year both professionally and personally. He and his wife Mickey spent the first two weeks of 2023 visiting their daughter and son-in-law and then-one-month-old grandson in New York City. In addition to teaching his Spring 2023 classes, he was able to get in some good skiing in February and March. In April he gave a lecture on some recent work (on Morita equivalence, joint with Mark Tomforde and Efren Ruiz), in three different venues: the UCCS Algebra Seminar, the University of Wyoming, and the University of Buenos Aires. "Unfortunately, that last talk was done via Zoom from my office at UCCS."

In the Summer of 2023 Gene got to teach a course at the University of Perugia (Italy) on Leavitt path algebras. It was part of Summer Institute for advanced master's level and first year PhD students from around the E.U. (most students were from Italy). The Institute has been running for more than 70 years; students must apply and be selected. The course lasted four weeks. "It was great fun! I think the fourteen students really enjoyed it!!" (Except for the first week, when it was 105 degrees in Perugia, and there was no AC in either Gene's flat or the classroom.) Perugia was quite nice, he and Mickey got to ride bicycles every day. One evening there was a dinner with the other professors (and their families); you could clearly see the famous town of Assisi in the distance from the restaurant.

LAS OUTSTANDING INSTRUCTOR FOR 2022/2023

This past year was a very enjoyable one for me in the Math Department! I had the opportunity to spend the Spring/Summer 2023 and Fall 2023 semesters focusing on teaching Calculus 2 and Calculus for Business and Economics. Having the chance to teach Calculus 2 again for the first time since remote instruction in Spring 2021 was a blessing as I was able to revamp the note packets that I provide to my students, to incorporate more visual instructional tools for my students, and even transition the course over to utilization of primarily online homework for quicker feedback. I was very fortunate to have the chance to work with some really fun groups of students this last year and have enjoyed getting to continue to associate with them on campus even after the conclusion of the course. In May, it was a surprise and a pleasure to receive the **College of Letters Arts and Sciences award for Outstanding Instructor for AY 2022/2023**. I was deeply humbled by the experience and am very thankful to both my colleagues and students who provided the support and means to strive for such a goal.

Outside of school, I spent most of the year riding bikes (as usual), taking hikes with my son Oliver on our days home together, and spending as much time with wife as possible despite busy work schedules!

I look forward to another excellent year in the Math Department and to what the new year will bring!

>>> **REBECCA AFANDI**

Last spring, **Rebecca** finished her second year of teaching at UCCS and her first year of teaching remotely from Münster, Germany. She enjoyed teaching online sections of college algebra, trigonometry and business calculus and is continuing to teach remotely during the fall.

This spring, Rebecca enjoyed traveling to Bratislava, Slovakia to visit friends and see castle ruins. Rebecca has also enjoyed playing violin and meeting more German friends as part of the Mozart Orchester.

P**eter** had another fulfilling year as chair of the department. There's never a dull moment!

On the outside-of-work side, he went to Spain with one of his sons to visit his daughter and see the amazing sights. Madrid is positively hopping around Three-Kings Day! Spring Break brought a trip to the Emerald Isle with his wife and his high school daughter. Harrowing driving with beautiful, rugged scenes were the norm. In Summer, he, three daughters and one son converged on the beach in Florida near their old home.

>>> RADU CASCAVAL

Radu Cascaval's 2023 high point was attending ICIAM (International Congress of Industrial and Applied Mathematics) in Tokyo, Japan, in August. This is the premier international gathering of applied mathematicians that takes place every 4 years (the previous one was in 2019 in Valencia, Spain, which Radu attended as well, and where he met the king of Spain himself). This time around, the emperor of Japan did not show up! Everything else was great, especially the adjacent 2-week trip in the Japanese alps with his entire family. This included a visit to the Yamanashi superconductive maglev testing facility for the upcoming Chu Shinkansen, which will be the fastest commercial train in the world with speeds exceeding 500 km/h.

Starting in Summer 2023, Radu embarked on a new applied research project, this time sponsored by the Colorado Department of Transportation, on predicting and modeling flash flood events. This involves a combination of Machine Learning techniques applied to traditional water wave modeling. Radu attended a very informative workshop on Mathematical and Scientific Machine Learning at ICERM institute Brown University. In the teaching rubric he taught in Spring the Scientific Computation 2 course, where he introduced modern techniques, such as spectral, meshless and machine learning methods for solving scientific computational problems arising from physical applications.

>>> KATHERINE CLIFF

ROCKY MOUNTAIN SECTION — MATHEMATICAL ASSOCIATION OF AMERICA

Over the past year, **Katherine** continued her work teaching, course coordinating, and mentoring. She presented at the UCCS Teaching and Learning Conference on using technology to encourage student engagement and participated in a working group on corequisite instruction at the Rocky Mountain Section MAA conference. She had a particularly fulfilling semester this fall mentoring new Graduate Teaching Fellows and supporting their work as new teachers.

Over the summer, she spent a lot of time at the pool with her daughters. She also braved hail and lightning to see her favorite band at the 50th Telluride Bluegrass Festival!

>>> JUSTIN COLE

I have had 3 research papers accepted and 3 more manuscripts submitted. I have given 7 talks so far this year. The furthest was a metamaterials conference in Paris over the Summer.

Probably the most excited piece of professional news is that I received my first external grant last year. The award is the Young Investigator Program, and it is a 3-year early-career award from the Air Force Office of Scientific Research. One great thing about the grant is that it will totally fund two graduate students over three years.

I also taught Optimization and ODEs for the first time; both have been fun courses.

>>> ALEXANDRA EPSTEIN

Over the summer, my husband and I were finally able to go on our honeymoon, which ended up being over our 3rd anniversary (2020, turns out, was not a year to go on vacations). We spent 15 days driving all around Iceland (picture attached), walking throughout Copenhagen, and taking trains and boats all through Norway. it was truly a trip of a lifetime and would highly recommend all those places for people to visit.

I also became 2-time aunt with another niece and just recently found out a nephew is on the way!

Academically speaking, my very first research paper (outside of my dissertation) was published in the Communications in Algebra online journal. This was work done with colleagues from my time at Florida Atlantic University and discusses when the ring of continuous functions, $C(X)$, has certain properties.

>>> ZAK MESYAN

Zak Mesyan published two papers this year (with a combined page-count of 140), and had another accepted. He spent the spring semester on sabbatical, during which he wrote and submitted a paper on a new to him subject- -congruences in semigroups. During the summer Zak gave a talk at a conference in Graz, Austria. After the conference he visited Belgrade, Serbia, for the first time, and then spent a week in Israel with his wife, Maria.

In the Fall of 2023 Zak took over as the organizer of the department's algebra seminar, known informally as "Rings and Wings". The seminar was created by Gene Abrams, who served as the organizer since its inception.

Continuing a longstanding tradition, here is a list of the concerts attended by Zak and Maria this year: Eric Clapton, Les Claypool's Frog Brigade, Dave Douglas & Elan Mehler, Peter Oundjian & the Colorado Symphony, Queens of the Stone Age.

>>> SHANNON MICHAUX

During Spring Break of 2023, **Shannon Michaux** had the opportunity to go to the Florida Keys to run the 7 Mile Bridge run. The race travels along the Overseas Highway just north of Key West. Shannon enjoyed watching the sun rise during the race which runs between the Atlantic Ocean on the right and the Gulf of Mexico on the left.

>>> GREG MORROW

SQUEAK

SOCKS

This past year, besides hanging out with his two cats, Squeak and Socks, **Greg** first revised his paper on "Gambler's Ruin with Random Stopping", and this work was subsequently published in Stochastic Models. Over the summer, Greg revised his paper on "Bernoulli Number Identities for Associated Stirling Numbers and Derangements". Recently, the Australasian Journal of Combinatorics accepted this paper.

Greg taught Modern Analysis II in the Spring and co-wrote and graded the comprehensive exam in analysis over Modern Analysis I & II. Greg taught Applied Functional Analysis in the Fall. He enjoys the mix of linear algebraic and analytical ideas in the course and the text (E. Kreyszig) is clear and interesting. He is looking forward to teaching Real Analysis I (including the Lebesgue integral) in Spring 2024, that is the continuation of the core sequence in Real and Functional analysis. Some topics from Functional Analysis as well Probability take on a fresh look with the Lebesgue integral in hand, so we hope to share these perspectives.

2023 has felt like a whirlwind for **Jordan**! Teaching at UCCS has continued to be a highlight for him as he loves partnering with students to help them learn and succeed to their fullest extent. He also got the opportunity to work on a team in the department lead by Katherine Cliff in creating a new interactive calculus textbook (that is still being tweaked) aimed at Calculus 1 students. Beyond teaching and writing, he has continued to coordinate the department teas to help bring folks in the department together.

Personally, Jordan has had a lot of great adventures with his partner as they travel around Colorado to hike, watch meteor showers, and try delicious coffee and food wherever they go. It has also been a very challenging year due to his partner having some rather harrowing health complications that they have had to face together. In midst of everything, they celebrated their 10th year of marriage this summer, and they are both very excited to travel over the upcoming winter break to New Zealand to celebrate their partnership and share in their first overseas adventure together!

>>> GEORGE RUS

The year 2023 was a busy year for **George**! Professionally, George continued in his administrative roles as an Assistant Dean in the college, as well as the chair of the Undergraduate Committee. These positions kept him busy throughout the year. In the fall semester, George was able to teach one of his favorite courses, Numerical Analysis.

Personally, George was extremely active. In June he and his family traveled to Chicago and in July they explored Zion National Park. Back in Colorado, George participated in more than a few trail races and hiked with his family. In July, they hiked two 14ers (Grays and Torreys), in September, he competed for the first time in the Pikes Peak Marathon (run to the top of Pikes Peak and back down), and, in October he completed his first 50k (31 miles trail run) race.

>>> DENIS SILANTYEV

Denis went on a cross-country trip from Seattle, WA to Buffalo, NY this summer with a friend. We visited Yellowstone Park and many other interesting places along the way. He also started exploring nearby mountains and hiked many trails near Colorado Springs with a group of local friends over the Summer.

Denis started working on research in applied math with Joseph Noernberg, a PhD student, this Summer. Thanks to CRCW Seed Grant, they continued working on the same topic thought Fall 2023 and plan to continue in future.

⋙ Department Publications

Abrams, Gene and Roozbeh Hazrat. "Connections between Abelian Sandpile Models and the K-Theory of Weighted Leavitt Path Algebras." European Journal of Mathematics 9, no. 2 (Jun 1, 2023). doi:10.1007/s40879-023-00613-4.

Chakravarty, Sarbarish and Michael Zowada. "Multi-Lump Wave Patterns of KPI Via Integer Partitions." Physica. D 446, (Apr, 2023): 133644. doi:10.1016/j.physd.2022.133644.

Morrow, G. J. (2023). Gambler's ruin with random stopping. Stochastic Models, , 1-37. https://doi.org/10.1080/15326349.2023.2241066

Oman, Greg & Charles N. Curtis (2023) Problems and Solutions, The College Mathematics Journal, 54:2, 147-160, DOI: 10.1080/07468342.2023.2186094

Oman, Greg and Nicholas J. Werner. "Countably Coverable Rings." Communications in Algebra. (Feb 17, 2023): 1-14. doi:10.1080/00927872.2023.2172177.

Hazrat, R., & **Rangaswamy, K. M.** (2023). Distinguishing leavitt algebras among leavitt path algebras of finite graphs by the Serre property. Archiv Der Mathematik, 121(2), 133-143.

Rangaswamy, Kulumani M. "A Note on the Dixmier-Moeglin Equivalence in Leavitt Path Algebras of Arbitrary Graphs Over a Field." Communications in Algebra 51, no. 1 (Jan 2, 2023): 20-28. doi:10.1080/00927872.2022.2087079.

Yang, Yunan, **Denis Silantyev**, and Russel Caflisch. 2023. "Adjoint DSMC for Nonlinear Spatially-Homogeneous Boltzmann Equation with a General Collision Model." Journal of Computational Physics 488: 112247. https://doi.org/10.1016/j.jcp.2023.112247

Dyachenko, Sergey A., Vera Mikyoung Hur, and **Denis A. Silantyev**. "Almost Extreme Waves." Journal of Fluid Mechanics 955, (Jan 25, 2023). doi:10.1017/jfm.2022.1047.

Ablowitz, Mark J., **Justin T. Cole**, and Igor Rumanov. "On the Whitham System for the (2+1)-dimensional Nonlinear Schrödinger Equation." Studies in Applied Mathematics (Cambridge) 150, no. 2 (Feb, 2023): 380-419. https://doi.org/10.1111/sapm.12543

⋙ Grants Awarded

Radu Cascaval - A High-Fidelity Predictive Model of Flash-Flooding for Improved Transportation Safety in Eastern Colorado. Colorado Department of Transportation

Justin Cole - Topological Insulators in Magneto-Optical Media. Air Force Office of Scientific Research