

VOL. 26 ISSUE 1

UCCS MATH DEPARTMENT 2022 NEWSLETTER

All the **V**'s that's fit to print!

2022 LAS AWARD WINNERS

During the Spring and Summer/Fall LAS Awards Ceremonies, the following Mathematics students were honored for their academic achievements during 2022 by the College of Letters, Arts and Sciences.

OUTSTANDING UNDERGRADUATE AWARD WINNERS:

- SAGE STENHAUG
- MICHAEL NAMEIKA
- EVAN SENKOFF

OUTSTANDING GRADUATE STUDENT-MS

- KRISTEN GEARHART
- VAN HOVENGA

OUTSTANDING GRADUATE STUDENT-PHD

- MICHAEL ZOWADA



In This Issue:

Math Center Update
PAGE 02

Math Department Activities
PAGE 03

Math Department
Graduates
PAGE 07

Graduated Student Profile
Michael Zowada, PhD
PAGE 08

Math Faculty Updates
PAGE 09

Oman's Offerings
PAGE 16

Math Center Update for 2022

The Math Center has spent this past year recovering from COVID. While the number of students visiting the center isn't what it was pre-pandemic, it is noticeably busier than it was last year. The collaborative energy is back, with students and tutors attacking problems together at the whiteboards, posing challenge problems for each other and generally having fun working together again.

In the spring, the center hosted its first semi-annual Art Night at which Math Center employees and friends created paintings together (some of these are on display in the Math Center staff office). This fall the Math Center hosted a casino game night as part of the campus' Involvement Week. About 100 students came through the center to gamble for "Math bucks," eat, and drink designer mocktails (mudslides were very popular).

This past month we said goodbye to Sean Dean. (Ed's note: sigh.) Sean was the Math Center's Assistant Director for the past eight years. He has taken a position as a program analyst with the Colorado Department of Human Services. His impact on the center, especially the PASS program, will endure for a long time, and he'll be greatly missed by the center staff and student visitors. Hopefully, he'll stop in and say hello when he's on campus for the courses he plans to teach for the College of Education.



Math Center in
December 2022



Lorch Scholarship Awarded



Lorch Scholarship winner Gabi Ansley

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.

In 2022, the department awarded the Lorch Scholarship to two students, Anthony Langdon and Gabi Ansley. Both awardees were grateful to be chosen and Gabi wrote "I would like to express my deep gratitude for being awarded the Lorch Scholarship. This scholarship has allowed me to invest more time and dedication into my education, and for that, I am extremely grateful. The journey of being a math major is not easy but totally worth it. This scholarship was awarded to me during a critical time in my studies, and the emotions I felt were immense. It truly brings me joy to share my love for math with others and I hope to continue doing so throughout my life. Thank you again to the Lorch Family."



MATH DEPARTMENT ACTIVITIES IN 2022

COMAP MCM/ICM CONTEST

The annual COMAP MCM/ICM contest took place on February 17-21.. UCCS was represented by three teams of undergraduate students (2-3 students in each team), who worked on these three problems:

Problem A

(modeling power profile of a cyclist and developing the best strategies for different trial courses),

Problem D

(developing business models and strategies on how to turn data into knowledge and competitive advantage for companies), and

Problem E

(optimizing forest management approaches for maximum carbon sequestration).

More detailed descriptions of the problems can be found at:

<http://www.comap-math.com/mcm/index.html>

All three teams earned "Successful Participant" Certificates.

Team A: Donovan Leyba, Spencer Kidd;

Team D: Adam Blevins, Brendan Gould,

Team E: Rachel Johnson, Jaden Mascarenhas, Aidan Rooney.



COMAP Contest Faculty Sponsor Denis Silantyev notes: "I think it went well and the students got valuable experience while thinking and solving real-world problems in this contest."

Also, Teams A and E presented their findings at the 18th Front Range Applied Math Student Conference at CU Denver Campus on Mar 12, 2022. Congratulations to all the participants!

"I think it went well
and the students got
a valuable experience
while thinking and
solving real world
problems in this
contest."

Denis Silantyev



Math majors Donovan Leyba (L) and Spencer Kidd formed one of the three UCCS Modeling Contest Teams in February

AMS Student Chapter Events in 2022

<https://math.uccs.edu/ams-chapter-events>

SPRING 2022

- Pi Day Celebration, Apr 18, 2022
(some photos of the event are at:
◦ <https://math.uccs.edu/ams-chapter-events>)
- Graduate Student Presentations, Apr 18, 2022
- LaTeX Workshop, Apr 25, 2022
- Website and CV Workshop, May 2, 2022

FALL 2022

- Social Event (where we socialized, played table games and ate pizza together), September 21, 2022
- Math Movie Night (watched movie "Proof", October 12, 2022)
- Research Panel (Radu Cascaval, Justin Cole and Denis Silantsev gave brief talks on their areas of research), November 16, 2022
- Graduate Student Presentations (Jack Kessler, Carl Cassidy and Michael Nameika presented on math topics of their choosing), December 7, 2022

Math Incline Hikes Resume



L to R: Radu Cascaval, Steph Klumpe, Jarrod Carroll-Frey, Jonathan Thompson, Ashley Beushausen, Carl Cassidy, Denis Silantsev

In Spring an old tradition, the Math Incline Hikes, was revived, this time as a weekly event held on Fridays. There is a standing open invitation for all to join the hike (for about 30-45 min) on the bluffs north of the main campus, to possibly meet some new people, chat with a friend from a different department, etc. There are NO math prerequisites! Several faculty, staff and students attended regularly. The hikes continued in Fall (until the cold weather arrived in November), and most days the hikers were treated to glorious 360 degree vistas. The hikes should start again as soon as the ice melts on the trails in Spring, and the organizers are looking forward to attracting folks from other LAS College departments as well. To this end, the Math Incline hikes have been officially rebranded as 'LAS Math Inclines'. Watch for an email invite in Spring 2023. Here's a photo of some of the hikers (taken by LAS College Dean Vidler).

THE MATH CLINIC



The Math Clinic acknowledges a generous sponsorship from the Rocky Mountain Chapter of AFCEA (formerly known as the Armed Forces Communications and Electronics Association): <https://www.afcearockymtn.org/>

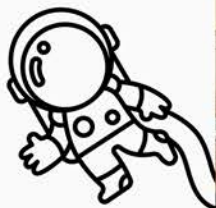
L TO R: MATH CLINIC STUDENT ASSISTANT JONATHAN THOMPSON, TOGETHER WITH MATH CLINIC INTERNS JARRID CARROLL-FREY, STEPH KLUMPE, JACK NAGLE, NATALIE CROW, JACK KESSLER

The Math Clinic is a brand new program at UCCS, established in January 2022, designed to provide students with exposure to real-world problems and interaction with real-world clients from industry and agencies or other stakeholders outside academia. The Math Clinic projects are selected to have a significant mathematical/computational component, and must be driven by non-academic partners/clients. It is the first such internship program hosted by the Math Department in its history.

The first cohort (five interns) engaged in the inaugural internship in Summer 2022, with projects suggested and guided by research staff at Amazon, Inc. headquarters. Upon the successful completion, three interns reapplied to the Fall internship program (Oct 1-Dec 16), together with three new interns. During Fall, one project with Amazon is ongoing, while another one is with Sanderson Stewart, Inc, a civil engineering company based in Fort Collins, to work on a joint project with Academy School District 20. Dr. Peter Braza, Dr. Radu Cascaval and Dr. Denis Silantsev are currently advising students on the current projects. Dr. Cascaval notes: "We anticipate the Math Clinic to run similar 9-week programs every semester in the future, subject to the availability of funds." Any faculty interested in advising students with such projects are welcomed to join. More information about the role of the external client, faculty advisor and interns can be found on the Math Clinic website <http://mathclinic.uccs.edu>.

In Spring 2022, the Math Clinic organized a series of workshops for potentially interested students, introducing relevant data science and machine learning tools to the students. These workshops were open to all UCCS students and faculty and were developed and led by our own Jonathan Thompson, who is a math PhD student. Jonathan had no small role in getting the Math Clinic off the ground altogether, and he has been acting as the Math Clinical Technical Assistant and support for the interns throughout the year.

Some photos from the Math Clinic Celebration in September 2022 (at which the summer interns were recognized for their contributions) are posted here: <https://math.uccs.edu/math-clinic-event-photos>



UCCS student group during the 2022 Space Symposium tour at the Broadmoor

After a hiatus of three years due to the pandemic, the Space Symposium returned to Colorado Springs as an in-person event, organized by the Space Foundation, and held at the Broadmoor Hotel. The Math Department has been organizing a student tour, led by Dr. Cascaval, Space Foundation Teacher Liaison, each Spring since 2017. "It is an out-of-this-world experience for UCCS students who otherwise would not have access to this world-renowned private space event," noted Dr. Cascaval. The primary purpose is to expose UCCS students to the space-related opportunities that could lie ahead for them. Next year's symposium is April 17-20, 2023, and we expect to organize another group to attend. "Onboard and mind the gap!"

WELCOME TO THE DEPARTMENT

ASHLEY BEUSHAUSEN

Last Spring Ashley Beushausen joined the math department staff as Administrative Assistant I. Ashley's duties include helping to schedule rooms and catering for department events, scheduling placement tests, assisting with graduate paperwork, and doing web edits (among other things).

Ashley was born and raised in Illinois in the suburbs of Chicago. Within a couple years of finishing her undergraduate degree in Elementary Education, she began to move around to other states to work in or near national parks. Over the course of three years, she lived in five different states while working near Denali, Grand Canyon, Yellowstone, Rocky Mountain, and Death Valley National Parks. Ashley developed a love for the mountains through these experiences. She moved to Colorado Springs in July 2021 with her boyfriend Christopher. Since starting at UCCS, she has started taking classes to work toward a Master's Degree in Public Administration.

During her free time, she enjoys outdoor activities such as hiking and camping. Her other hobbies include creating jewelry and playing video games. Ashley and Chris have two dogs named Moose and Loki. Moose is a shepherd, pitbull, and cattle dog mix. Loki is a boxer mix. They are an enormous handful and keep Ashley busy!



(ed's note: Ashley spent much of her childhood and teen years as a big Chicago Cubs fan. She even won a contest, and thereby got to meet some of the players in the Cubs' dugout! Here Ashley is discussing the subtleties of the infield fly rule with then-Cubs-infielder and current-MLB-Network-commentator Mark DeRosa.)



UCCS CLASS OF 2022

CONGRATULATIONS MATH GRADUATES!

Undergraduate Degrees

B.S. MATHEMATICS

SPRING 2022

- Jasper Arbaugh
- Samantha Baker
- Jacob Felton
- Haleigh Foster
- Haliegh Gray
- Michael Hester
- Kaitlyn Hovasse
- Daisy Jauregui
- Jordyn Kinsey
- Mariah Lewis
- Andrew Nicholson
- Evan Senkoff**
- Samantha Turner
- Robert Weedman

FALL 2022

- Nicole Chiddix
- William Dalke
- Esther Gonzalez Rios
- Jack Nagle
- Michael Nameika**
- Sage Stenhaus**
- Edward Stoklosa III
- Molly Unruh

** Outstanding Undergraduate Student

CONGRATULATIONS



Graduate Degrees:

M.S. APPLIED MATH

- JARRID CARROLL FREY
- CARL CASSIDY
- KRISTEN GEARHART*
- VAN HOVENGA
- JACK KESSLER
- KADEN RIPPINGILL

* Outstanding Graduate Student

PhD-Applied Science
(emphasis in Math)

- Michael Zowada*

"Classification and Analysis of
Rational Lump Solutions to the
Kadomtsev-Petviashvili I Equation."

Recent Graduate Profile

MICHAEL ZOWADA, PHD

Each year the Newsletter profiles a graduate of one of the department's programs. The 2022 profile is of Dr. Michael Zowada, who earned his Ph.D. here at UCCS in May.

v'sletter: Tell us a bit about your pre-UCCS background.

MZ: I grew up in Phoenix, AZ and was homeschooled through the majority of my early years. Although I didn't particularly like math (I especially hated times tables) I was able to move through the material at my own pace and by age sixteen I had reached a point where my mom couldn't teach me anymore. She sent me to community college and by my senior year of high school I had taken everything from College Algebra to Calculus II. My community college teachers really instilled in me a love for math. I enjoyed their classes enough that I decided to switch from an engineering major to mathematics when I transferred to Northern Arizona University. There I got my Bachelors and Masters degrees in pure mathematics.

v'sletter: How did you wind up at UCCS for grad school?

MZ: After graduating from NAU I taught high school for a year and I knew pretty quickly that I didn't want to do that for very long. Coincidentally, that year I met my wife who was a Colorado native. She was planning on moving back to CO so I started applying for jobs and PhD programs in the area. I ended up teaching one year at CU Boulder and then starting my PhD at UCCS the year after. Besides simply getting admitted, the biggest deciding factor was UCCS's graduate teaching program. I knew I liked teaching and I wasn't going to go into debt for my degree. In that way, UCCS made the decision easy.

v'sletter: Tell us about some of your experiences while you were a PhD student here.

MZ: I really enjoyed my time as a PhD at UCCS. I made some good friends amongst the other students. Our program is small and that made it really easy to get to know my colleagues. I certainly wouldn't have been as prepared for all the qualifying exams without my study group. I was really happy to see the graduate student community growing during my last year.

v'sletter: While you were pursuing your PhD, did you figure you'd work in industry after earning your PhD? Or was an academic career a possibility/interest as well?

MZ: I started my PhD with every intention of staying in academia. It wasn't until the end of my degree that I realized it wasn't really practical for me. The academic scene is competitive right now and people often end up moving between multiple universities before landing a tenure track job. My wife and I were planning to have our first child after I graduated and I didn't want us to have to move possibly multiple times with a baby. My wife also had an established career so I didn't want to upend that unnecessarily. We did end up moving to Virginia where we both found jobs that we love and have a 5 month old baby girl, Lena.

v'sletter: Tell us a bit about what your role is for MITRE. Are you using any specific tools or skills that you learned while earning your PhD?

MZ: I work for MITRE in a group called Position, Navigation and Timing: think GPS and other related technologies. My specific team does a lot of modeling and simulation so I do get to use a lot of the mathematics I learned throughout my education. I'm primarily using all kinds of calculus and linear algebra at the moment, but also some statistics and probability. Admittedly, I'm not currently using nonlinear partial differential equations but they do show up in the field I'm in and MITRE occasionally has to work with them. I have had to cross train to become more of an engineer, albeit one with an expertise in mathematics. I spent nearly a month poring through textbooks on how GPS works and am currently learning some statistics that I haven't had a class on before.

One of the biggest advantages I have coming from a mathematics background is a strong problem solving skill set. This is really valuable in the research and development work that MITRE does, enough so that they specifically look for mathematicians. I should also mention that I use coding every day. My PhD research required me to learn Mathematica and MATLAB and I use both of those very often in my work for MITRE. I haven't had to learn a lot of python but that day is almost certainly coming.

v'sletter: Are you and your wife still doing the triathlon thing ??? Do you have any other outside-of-work activities?

MZ: We currently have a 5-month-old baby girl, Lena. We absolutely adore her but she has made triathlon training a little bit more difficult. Kayla and I are still running but it's harder to mountain bike with a stroller. Kayla is planning to continue with triathlons starting next summer, she's not one to be idle for very long (ed's note and MZ's note: haha!) I started learning some carpentry while in Colorado Springs and have continued to do that in my free time here. I just finished a table for our breakfast nook. It's nice to have something very tactile to do after thinking hard all day.

v'sletter: Anything else you'd like to add?

MZ: I want to give a shoutout to my adviser Dr. Chakravarty. I'm really thankful for all the time and energy he spent working with me. He taught me a lot about how to approach difficult problems and how to explain complicated ideas clearly. I learned a lot in a short amount of time and the skills that I gained really prepared me well for the work that I'm doing now. I would also like to thank the other instructors/professors at UCCS that helped me learn good teaching practices. Although I'm not in academia anymore, those skills are still important since I often have to explain technical mathematics to non-experts.



AROUND THE DEPARTMENT

Zak Mesyan



Zak Mesyan's three-year term as department chair ended in June, and he is now ("happily!") focusing on research and teaching once again. This year Zak published two papers (including one with colleague Kulamani Rangaswamy), and submitted another. He also visited Roozbeh Hazrat, at Western Sydney University, to start a new research project. In May, Zak gave his first in-person talk since the start of the Covid-19 pandemic, at a conference in Columbus, Ohio. Zak taught Rings and Modules I (MATH 5170/6170) for the first time in Fall 2022. Given the unique nature of the course, this has required significant time, but has also been very rewarding.

On a more personal note, Zak and his wife, Maria, visited Seattle for the first time this summer. The coffee and cultural scenes there are very impressive, and Mount Rainier is astonishing! Reviving a long-standing tradition, here is a list of the concerts attended by Zak and Maria this year, arranged in order of increasing loudness: Juho Pohjonen, Victor Wooten, Robert Plant & Alison Krauss, Porcupine Tree, Tool, Iron Maiden.(ed's note: Judas Priest!)



Zak Mesyan in front of the iconic Sydney Opera House

Sarbarish Chakravarty

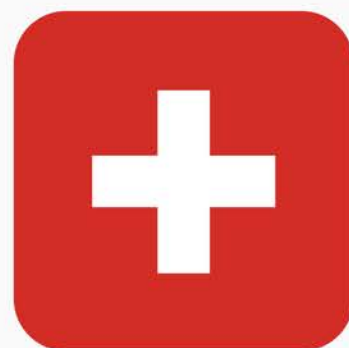


Sarbarish Chakravarty had fun teaching Analysis 2 to "a bunch of very good students who were always eager to learn more!" He worked with his graduate student Michael Zowada, who received his PhD in May and is currently working for MITRE in Virginia. (ed's note: see interview with Michael below.) Sarby and Michael coauthored and published two papers and have submitted another one, based on Michael's thesis. Sarby also continued his duties as the Chair of the department's graduate committee.

Sarby is on sabbatical leave this fall. He is currently visiting India after postponing his trip twice due to Covid. In India, he is collaborating with his colleagues at the S. N. Bose Center for Basic Sciences and at the J. C. Bose Institute, both in Kolkata. Besides research, Sarby plans to have some fun as well. He is looking forward to attending his High School reunion later in November, and meeting some of his schoolmates after 45 years!

Shannon Michaux

Shannon Michaux took the summer off from teaching for the first time since 2002. As part of the summer, she took a trip to Switzerland. "It was an amazing trip. I spent most of the time running and hiking in the beauty of the Alps."





Greg Oman

This year Greg Oman acted as advisor to undergraduate math major Evan Senkoff. (Evan was awarded the Outstanding B.S. graduate in math, and the Outstanding B.S. graduate in the Natural Sciences Division of the entire LAS College.). Greg had five papers accepted for publication (including one with Evan), gave an invited talk at the Sectional Meeting of the AMS in Chattanooga in October, and had an interview published in the MAA FOCUS Magazine (of himself along with the problem editors of The American Mathematical Monthly and Mathematics Magazine). He continues to serve as editor of the Problems Column of The College Mathematics Journal. In addition, he published three recreational problems in 2022, and has had 11 problems accepted for publication. As is traditional in the Newsletter, some of the recreational problems appear below in "Oman's Offerings".

Yu Zhang

Yu Zhang continued his research work on percolation in 2022. In particular, he was trying to show a scaling limit on the square lattice for critical percolation. Yu visited Boston to discuss this problem with a few people. In addition, he gave zoom talks regarding this topic through Beijing Normal University. He taught probability models and statistics theorems during 2022; he is confident that the students enjoyed these classes.

Radu Cascaval

As uneventful as 2021 was for Radu Cascaval, 2022 was quite the opposite. "Oh boy, where to start?" Radu continued his efforts on developing the computational curriculum for math students, by organizing a seminar in Spring centered on machine learning and deep learning tools for the sciences. Several faculty (including himself) gave talks in that seminar, which was well attended by students from various departments. Research talks alternated with workshops developed by Jonathan Thompson, PhD student, serving as hands-on introduction to python and data science. Radu is very grateful to Jonathan for being an inspiration to so many of his peers. Radu co-launched the UCCS Math Clinic, first during the Math Modeling class in Spring 2022, then as a stand-alone internship program (see the article about the Math Clinic in this Newsletter). During Fall he did enjoy teaching the Scientific Computation course again, after four years away from it, and is hoping to continue increasing the scientific computation exposure for our undergrad and grad students. In November, he gave an invited lecture at the USAFA Research Undergraduate Colloquium and also a presentation to the AMS Student Chapter. He also oversaw the revival of the SIAM Student Chapter. Radu is always looking for ways to connect with more faculty and students. The Math Incline weekly hikes (see separate article) are one such venue and he hopes to see more people take advantage of our amazing campus outdoor setting.

On a personal level, during the Summer break he hiked on the Mont Blanc Tour with his family and enjoyed crossing three borders in a matter of days, including the border between France and Italy by foot.



THE CASCAVAL FAMILY
HIKING ON MONT BLANC





Jenny Dorrington

This past year, Jenny Dorrington taught her usual classes and enjoyed being able to see her students in person again. In the summer, she travelled to Costa Rica to spend some time with her brother and his family, who have moved permanently to Costa Rica and recently built a house there. Three days after returning home, she and her husband Jeff took to the road with their daughter and three grandchildren on a tour of Dinosaur National Monument, Arches National Park (during the 100-degree plus weather) and the Black Canyon of the Gunnison. The kids were impressed by the dinosaur bones and arches, but loved the hotel pools the best.

Kulumani Rangaswamy



YOUNG, YOUNGER, YOUNGEST

Professor Emeritus Kulumani Rangaswamy had a quiet year in 2022. He collaborated with Roozbeh Hazrat to write a paper investigating Leavitt path algebras over which finitely generated projective modules are free. (This work led to an interesting conjecture that sits in between two well-known conjectures in Leavitt path algebras.) In May, Ranga gave an invited colloquium talk at Baylor University in honor of the retirement of his research collaborator Manfred Dugas.

Ed's note: Ranga celebrated his 84th birthday this summer. It was such a pleasure to have lunch with Ranga's wife Sarah, my wife Mickey, (Emeritus Professor) Jim Daly, and Jim's wife Mary. The six of us met downtown on July 12 for an outside meal. We swapped some stories (mostly true) of the "good old days" (editor and Ranga started in the UCCS Math Dept in 1983, Jim a year later).

Rebecca Afandi

Last spring, **Rebecca Afandi** finished her first year of teaching at UCCS. She enjoyed teaching Calculus II and linear algebra and participating in the "Algebras and Rings in Colorado Springs" (ARCS) seminar.

In May, Rebecca moved to Münster, Germany where her husband has a postdoc with the math department at the University there. She took some online course design classes through the UCCS Faculty Resource Center over the summer, and has been teaching remotely during the fall.

In Rebecca's spare time, she has been working on learning German, playing violin and learning how to knit. She also ran a 6K with friends in September in Münster, and enjoyed the ease of running at an elevation of only 200 feet!



REBECCA CRUSHING A 6K RUN



Alex Epstein

On April 6th Alex Epstein gave a talk for the Algebras and Rings in Colorado Springs (ARCS) seminar, in which she outlined the research she did for her PhD dissertation. "The audience was engaged and gave great feedback and ideas for things to think about further." On May 3 Alex became an aunt for the first time to a beautiful girl, Mila, who lives in Austin, TX. Alex and her husband were able to visit Mila over the summer.

Also in the summer, Alex took to knitting like she had never before!! She completed dozens of projects, and even designed her own hat pattern. She was able to publish the pattern online. "I even named it after Emil Artin, the Austrian-Armenian mathematician, and called it the Artin Hat!"



Jacob Karn & Bill the Cat

"What happened in 2022? Jacob Karn and his cat Bill are still trying to figure it out. Jacob joined a committee or two this past year. Bill figured out that he likes avocados. Jacob got back into watching baseball when the Padres made a playoff run (putting the Mets and Dodgers out of it) this year. Bill developed a habit of not sharing the pillow. Jacob began collecting ethnic flutes (so far with flutes from Peru, Japan, Egypt, and Turkey). Bill started to feel like he should be fed near immediately after Jacob comes back home from work. What remains consistent is that Jacob and Bill have been tackling the year together!"



♡
BILL ♡
♡

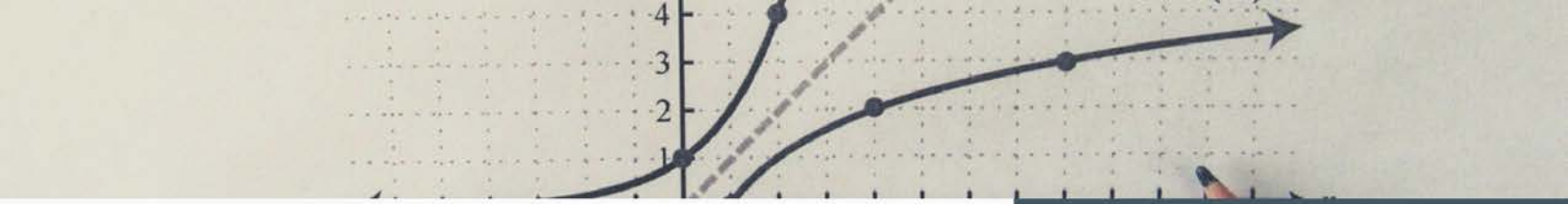
Justin Cole

Justin Cole's 2022 included some of the 'usual stuff': he taught some classes, did some research, and helped out with service. In particular, he started working with undergraduate math major Michael Nameika and graduate student Troy Johnson on research projects. Justin had received a UCCS Committee on Research and Creative Words seed grant in 2021, and was ready to use that money to hire Michael to do some research; but then Michael was accepted to the UCCS Undergraduate Research Academy (URA), and thereby received funding from that source. (ed's note: congrats to both Justin and Michael.)

In one of Justin's departmental service roles, he helped to successfully revise the MATH 2650 Intro. to Computation course. "This should be a big help to our applied math majors."

In total, Justin gave six talks in 2022 (5 in-person, 1 virtual), including a talk in the UCCS Math Department colloquium, one in Athens (Georgia), one at UMASS Amherst, and one at the Isaac Newton Institute at the University of Cambridge, England.





Reece Adragna



KAYLEN, OLLIE, AND REECE

2022 was a refreshing year for Reece Adragna at UCCS! Between having classes return to (mostly) normal in-person instruction starting in Spring 2022, to “finally being able to see my students’ faces again, it began to feel like the pre-pandemic days. I was very thankful to see the campus bustling with students eating at the cafeteria and enjoying unmasked conversations together at the coffee shop once again.”

In 2022, Reece was able to focus on teaching some of his favorite classes, including Calculus for Business, Calculus 3, and Intro to Linear Algebra. “I felt that by requesting to teach some common classes from semester to semester, the time spent improving my course materials (note packets, illustrations, and animations in Mathematica, etc.) was worthwhile and contributed to student success throughout the year”. He enjoyed teaching Intro to Linear Algebra, through which he was able to re-connect with some students that he had in class before the transition to remote learning, and some students that he had in class during remote learning and never actually met in-person. One new experience that he had during Fall 2022 is teaching the MathOnline section of Calculus 3 consisting of mostly high school students. He really enjoyed the experience, and is thankful to be a part of offering students in high school to take a math course at UCCS. “I am proud of the outcomes from this past year at UCCS and look forward to another year of development and improvement in 2023!”

“Outside of school, I spent most of my time learning how to be a dad! My son Oliver (Ollie for short) turned 1 in October, and it has been such a blessing to watch him develop and grow every day. I am fortunate to be able to have him at home on the days when I am not teaching and we have enjoyed lots of time reading books, playing with anything that spins, and going up and down the stairs many times a day. My wife Kaylen and I cherished our summer together with Ollie and we even got to take a few short trips to the mountains with family. During one of those trips, we rode the Children’s Hospital Courage Classic road bike ride which covered around 165 miles over two days in Copper Mountain. Ollie opted out of the ride this year, but he has a bike trailer now and may decide to join in on some rides next summer!”

George Rus



The year 2022 was eventful for George Rus, both professionally and personally. George was very happy to be able to be teaching in person again and enjoyed interacting with his students. Starting in August, George took on an administrative role in the College of LAS as the new Assistant Dean for Online Education. Some of the responsibilities of his new position are to provide technical assistance for online faculty, to help faculty develop and revise responsive plans for online education, and to serve as the College liaison to campus-level online staff and administration.

Personally, George was extremely active. In early April, he travelled to Virginia to compete in his first triathlon, and in June he completed his first half Ironman (1.2 mile swim, 56 mile bike, and 13.1 mile run). Back home, he competed in more than a few trail running races, and, in September, he competed in the Pikes Peak Ascent (13.3 mile run to the top of Pikes Peak).





Jordan Nikkel

2022 has been a great year for Jordan Nikkel, as he enters his third year of teaching at UCCS. This fall, he jumped at the opportunity to lead the department's teaching seminar for new Graduate Teaching Fellows, and he is grateful for the wonderful discussions and dedication to teaching that our GTFs are showing. Jordan also started a new tradition in the department: a twice per semester tea where the department gets together to relax and connect with one another over light refreshments.

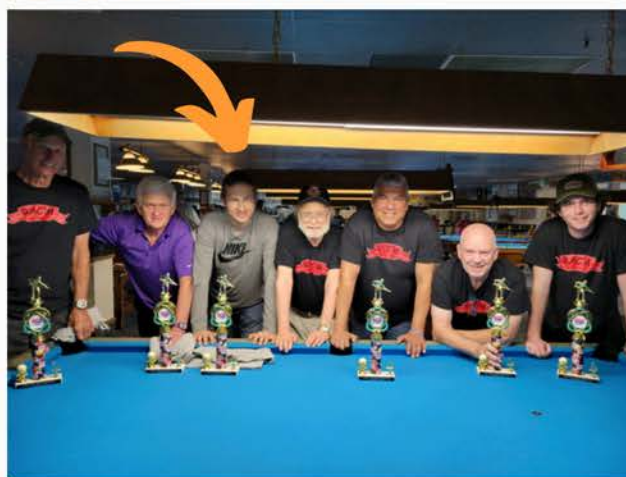
Personally, Jordan is thrilled to welcome to the world his new niece, Eliana. Many wonderful weekends have been spent with his brother-in-law and his family this year, including many wonderful playtimes with Eliana's smart and sassy two-year-old sister. Jordan and his partner have also continued to have many wonderful hiking adventures in Colorado, and they greatly enjoyed their annual trip to see the meteor shower in the dark sky community of Westcliffe. They also enjoyed some wonderful horseback riding in the same region, an activity they had not done in quite a few years.

For Denis Silantyev, 2022 was really fruitful, academically and personally. He published three papers with his collaborators and presented his work at two in-person conferences and multiple online conferences and seminars. "After two long years of online-only communications due to COVID I was really glad to finally go to a conference in-person and see many colleagues and familiar faces" at the 12th IMACS International Conference on Nonlinear Waves at the University of Georgia, Athens, GA (March 30 - April 1). At that conference Denis organized a session and gave a talk on his recent work about the generalized Constantin-Lax-Majda Equation.

Denis was extremely busy with numerous department and campuswide activities this past year. He was the faculty sponsor for the COMAP Modeling contest in February (see article below); he helped judge and grade the Math Olympiad in October; he helped lead the Math Clinic (see another article below); was a member of Michael Zowada's PhD thesis committee (see yet another article below); and helped organize various student events throughout the year.

"This year I've taken time to better settle in Colorado Springs, travel around a little bit and explore places in Colorado Springs and surroundings areas." One of his favorite local experiences this summer was the Lantern Tour at Cave of the Winds, where they take people through the pitch-black caves with barely glowing lanterns while telling scary stories about these caves along the way. In his free time Denis has indulged in many of his hobbies over this year, such as motorcycling around the town, mountain biking in Palmer Park and Austin Bluffs Open Space, playing tennis at Memorial Park, playing badminton with faculty and students at UCCS Rec Center, going on hikes and mushroom picking trips with my friends to the Pikes Peak and Cheyenne Mountains over the summer, and playing pool. (ed's note:whew!). "I play pool on Wednesdays with Colorado Springs APA Pool League, and over the summer our team took 1st place among teams that play on Wednesdays in both 8-ball and 9-ball games."

Dennis Silantyev



DENIS WITH THE COLORADO SPRINGS APA POOL LEAGUE



PETER HIKING IN THE GREAT BASIN NATIONAL PARK

Peter Braza



On the professional front, Peter Braza took over as chair of the department in July, and really enjoys it. He also submitted a paper and had it accepted. The family/vacation front was active for Peter as well, and as usual. An unusual highlight was a trip to Great Basin National Park in Nevada in June. "We hiked above 10,000 feet in the snow and saw some ancient Bristle cone pines. There is nothing around this park for a hundred miles." On the way there he and his family stopped for a few days in the Palisade (Colorado) wine country. (Highly recommended!) He also hit Rocky Mountain National Park (the best or second best park in the west), State Forest State Park (a neighbor of RMNP) and the South Slope section of Pikes Peak.

Back to UCCS - Peter enjoys seeing the success of our students, and hopes for another good year coming up.

Gene Abrams



THE DOLOMITES, AS SEEN FROM THE TOWN ZOPPÈ DI CADORE

Gene Abrams had an enjoyable and productive 2022. His research collaborator Alberto Tonolo (U. Padova, Italy) spent four weeks in Colorado Springs in April/May. Together with Francesca Mantese, the three of them wrote an article about injective modules over Leavitt path algebras. "Alberto is an avid outdoorsperson; it was fun to go to Breckenridge with him, where we did some cross country skiing and hiking." Gene coauthored two other articles in this past year, one on "sandpile monoids", and the other on graded Morita equivalence.

Gene gave four hourlong online lectures in 2022, all of them about the sandpile monoids. He also gave a lecture on that same topic in Padova on October at a conference in honor of Alberto Tonolo's 60th birthday. The conference was quite interesting. Gene and his wife Mickey got to spend a day cycling, and a day hiking, in the Dolomites during that trip. They were guests of Alberto at his condo in the mountains for one night: it was beautiful!



Greg Morrow

Besides presenting all classes in a remote synchronous fashion during Spring 2022, Greg Morrow recorded Panopto videos of his Modern Analysis II (4320/5320) lectures and posted them in Canvas. Panopto videos of lectures were also made available to his Probability and Statistics (3810) students. In Fall, Greg conducted his classes in HyFlex format with in-person classes on one day per week (those were nevertheless recorded in Teams via Canvas link); on the other day, his classes met remote synchronously in Teams meetings that were also recorded for the students. He submitted a paper for publication entitled "Associated Stirling number statistics". He also wrote a working paper for a joint project with Sarbarish Chakravarty on generalizations of Viete's product formula for pi.

Katherine Cliff

This past year, Katherine Cliff continued to focus on teaching, course coordinating, and mentoring. In the spring, Katherine received the University of Colorado systemwide distinction of "OER Champion" for her work on Open Educational Resources, specifically for Trigonometry and Calculus. As a result of that award, she was asked to speak at an OER conference held by the Colorado state department of education over the summer. Here's a link to more info:

<https://connections.cu.edu/spotlights/chase-faculty-community-service-award-honors-educator-s-science-and-health-care-outreach>

"My family was fortunate enough to travel to Disney World in the summer! Though my poor Colorado girls were definitely not used to the level of heat and humidity, they had a blast, and continue to talk about their fond memories of rides and character visits." Katherine and family also took advantage of living in our lovely state by taking several camping trips, spending days kayaking on reservoirs, and visiting the zoo.



Colorado Nonlinear Days

On April 23 and 24, UCCS hosted the Colorado Nonlinear Days Conference. The organizers were Sarbarish Chakravarty, Justin Cole and Denis Silantyev. More than three dozen participants attended, from universities throughout the USA.

Denis notes: "I personally enjoyed this conference a lot, since it was a good-sized conference (21 talks) and it went at a reasonable pace, so it was easy to keep up with talks and it provided enough time during breaks to chat with the participants. For me, it kicked off a new collaboration with Dr. Steven Pankevich from Colorado School of Mines, as we discovered that we both interested in computational plasma physics." Financial support for the conference was provided by the LAS Deans office and the Chancellor.

For more info, visit <https://math.uccs.edu/colorado-nonlinear-days-2022>



Math Tea Time



Jordan Nikkel created a new tea tradition in the UCCS Math Department in 2022. Both Math Tea events were held in Fall 2022. Below is a picture of the December 8, 2022 Math Tea.



OMAN'S OFFERINGS

(1) [College Mathematics Journal 53 (2022) no. 1, p. 70, #1219]

Let R be a commutative ring with 1 not equal to 0. Suppose that for every ideal I and J , we have $IJ=I$ or $IJ=J$. Prove that R is a field.

(2) [College Mathematics Journal 53 (2022) no. 3, p. 237, #1228]

Let R be a ring, and let $f: R \rightarrow R$ be a function. Recall that f is multiplicative if $f(xy)=f(x)f(y)$ for all x, y in R , and if R has an identity, $f(1)=1$. Find all commutative rings R (not assumed to have an identity) such that there is an element a in R which is not nilpotent, and every multiplicative $f: R \rightarrow R$ is either the identity map or the zero map.

(3) [College Mathematics Journal 53 (2022) no. 4, p. 320, #1235]

Let S be a set and let $f: S \rightarrow S$ be a function. Recall that for s in S , the orbit of s is defined by $O(s) := \{f^n(s): n \text{ greater than or equal to } 0\}$, where we have $f^0: S \rightarrow S$ is the identity map and f^n is the n -fold composition of f with itself for $n > 0$. Next, a subset X of S is closed under f provided that for all x in X , also $f(x)$ is in X . Finally, if X is closed under f , then we say that X is finitely generated provided there is a finite subset F of X such that $X = \{O(x): x \text{ in } F\}$. Find all structures (S, f) up to isomorphism such that S is not finitely generated, but every proper subset of S closed under f is finitely generated.

[Recall that (S, f) and (T, g) are isomorphic provided there is a bijection $h: S \rightarrow T$ such that $h(f(s)) = g(h(s))$ for all s in S .]