

COUNTABLE BITS

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2021-2022 Back in Person

The past academic year was another unusual year on a world-wide scale, including for our department! Faculty and students were excited to be back in the classroom, after more than a year of distance learning. We dove right in, implementing appropriate distancing measures, even as they were modified semester by semester and block by block. We persevered with increased flexibility in accommodating both faculty and students who needed to engage from outside the classroom. New protocols, such as not eating together in an enclosed space, led to corresponding changes such as holding meetings outdoors, often in one of the tent-classrooms. In the warmer months this worked well - our Fearless Friday seminar in block 1 involved ice-cream under a canopy, and our traditional block 8 barbeque, if a bit windy, took place as usual by the beach volleyball courts. However we braved several snowy and windy lunches ahead of Fearless Friday talks, huddled by the west entry to Tutt. Eating became a race with the outcome determined by heat diffusion from hot pizza to freezing air. Despite difficulties to overcome, it was a year that saw most of our usual student activities taking place in-person. There was much satisfaction in being able to be in proximity again.

Modeling Teams

Mathematical models often optimize a limited resource such as time, money, equity, safety, or health. Instead of finding the "one right answer," students look for a solution that is "good enough" and then justify the model. The result is an action plan ready to deploy in the real world. This year, four teams signed up for the Mathematical Contest in Modeling (MCM) and Interdisciplinary Contest in Modeling (ICM), with 17,205 teams participating from around the world. Teams could choose from six problems in either the MCM or ICM, and two of our teams chose the ICM problem of modeling a futuristic society in which mining asteroids was technologically feasible; equity was to be a prime consideration for access and profits. These teams, comprised of upper classmen **Surbhi Bhutani** ('22), **Davidson Cheng** ('23), and **Yinting Zhong** ('22), and a team of freshmen **Cheng Gao** ('25), **Wanyan Yuan** ('25), and **Hanfang Zhang** ('25), scored (respectively) an Honorable Mention (awarded only to teams in the upper quintile), and a Meritorious award (meaning they ranked easily within the top 10% worldwide). Three of the teams attended the Front Range Applied Math Student Conference (FRAMSC) in Denver in March and presented their models. *(continued)*



FRAMSC attendees from left: **Yinting Zhong**, **Esa Cheng**, **Joshua McFeeters**, **Davidson Cheng**, **Eric Tang**, **Isabelle Wagenwoord**, and team advisors **Dr. Minho Kim** and **Dr. Jane McDougall**.

Graduating Majors, Colorado College 2022

Mathematics:

Dominic Altamura
Surbhi Bhutani
Emily Caligor
Albus Cao
Jordan Cooper
Ben Criteser
Lilly Davis
Oliver Li
Alayna Mann
Carter Norfleet
Natalie Schluter
Sandy Sun (Dec '21)
Tom Wan
Marston Xue (Dec '21)
Yinting Zhong

Computer Science:

Jane Abbott
Dominic Altamura
Surbhi Bhutani
Kassidy Chan
Arthur Chu
Connor Copus
Dakota Damato
Em Evans
Silas Howe
Chidera Ikpeamrom
Cameron Keeley
Jorge Adan
Takuto Namba
Ella Neurohr
Andrew Pinkham
Jillian Pollard
Case Regan
Magnus Rorapaugh
Claire Shin
Stephen Sigman
Dan Soares
Marco Tapia
Alex Zhu
Yvonne Zino

The Colorado College Department of
Mathematics and Computer Science

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Modelling Teams Continued:

Another team made up of **Esa Chen** ('25), **Felix Li** ('25), and **Jingyi Liu** ('25) tackled a problem that required a power deployment strategy for different members of a cycling team, based on the course location and the rider-specialty. The team comprised of **Joshua McFeeters** ('25), **Yousheng Tang** ('25) and **Haoru Yang** ('25) chose a problem addressing forest management in which public good, carbon sequestration, and sustainable long-term harvesting strategies were prioritized. We are proud of the fine work by all the teams in constructing and presenting the models! Team advisors were **Drs. Minh Kim** and **Jane McDougall**.

Rawles Exam

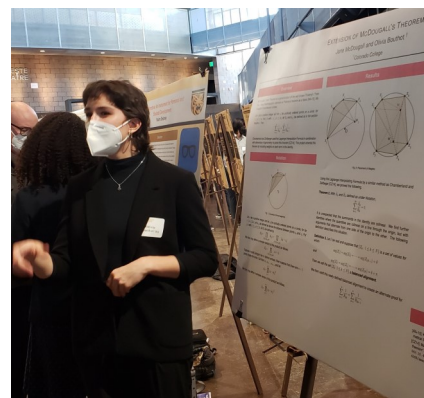
The first Rawles Exam was administered in 1972. Every year, honors are awarded to the top scorers in two divisions, First-Year and Second Year Division, and Junior and Senior Division. The prize money (\$100 for each top scorer) has been continuously awarded over these five decades from the Thomas Post Rawles Fund endowed by CC mathematics professor Thomas Hood Rawles to honor his son, who died unexpectedly at a young age. This marks the 50th year of the Rawles Exam and the 51st edition of the competition. Many CC students have wrestled with these demanding problems over the past half-century and have benefitted from the challenges that always accompany thought-provoking questions. This year, thirteen students took on the six problems from Rawles Exam #51 on Saturday, February 12, 2022. The competition was very tight, and every contestant exhibited skill and imagination. The top scorer in the First-Year and Second-Year Division was **Mustafa Sameen** ('25), and in the Junior and Senior Division **Davidson Cheng** ('23) came in first. Congratulations to both and thanks to all who participated and grew mathematically from the experience! Every problem attempted enriches you mathematically.

Putnam Exam

On December 8, 2021 eight CC students took the William Lowell Putnam exam. A total of 2975 students at 427 institutions around the US and Canada participated in this annual competition. The Putnam is a very challenging experience. Students face a total of 12 problems across two three-hour sessions, and the median score this year was four points out of 120. CC's team did very well, with our eight participants earning a total of 28 points. Way to go **Porter Barnes** ('25), **Davidson Cheng** ('23), **Gwen Hardwick** ('23), **Na'ama Nevo** ('23), **Tim Somerset** ('23), **Emerson Worrell** ('23), and **Anni Zettl** ('23)! The team was supervised by **Drs. Beth Malmskog** and **Cory Scott**.

JMM and Pi Mu Epsilon Poster Session

The Joint Math Meetings (JMM) were to be held in person in Seattle in January 2022, but due to surges in Covid, the meeting was postponed in the days before the conference to an online format in April 2022, although several workshops proceeded at the planned time in an online format. This conference attracts multiple thousands of participants. This year math major **Olivia Bouthot** ('23) presented in the Pi Mu Epsilon undergraduate poster session. While the poster session was virtual, Olivia did give a live version of her poster in February 2022 at the Colorado College SCoRe poster session. Faculty who participated in the 2022 JMM included **Dr. Jane McDougall** and **Dr. Beth Malmskog**, both of whom gave a talk, and **Dr. Malmskog** also co-organized a special session: *Advances in Coding Theory*.



Olivia Bouthot at the SCoRe symposium in February 2022

Students Present Summer Research

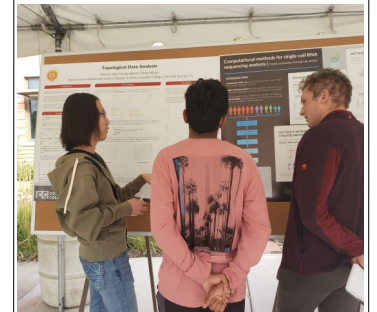
In October during block 2, the department held a poster session where students who had engaged in summer 2021 research experience or an internship in math and computer science could present research and/or describe their research experiences. The event was held in the Tutt Science Center Tent, with a backup plan to retreat with the posters to the Tutt Science Center atrium in the event of bad weather. Presenters included a computer science team **Em Evans ('22)**, **Gwen Hardwick**, and **Liz Seero ('24)** who worked with **Dr. Janet Burge**, and computer science majors **Jessica Hannebert ('23)**, **Daniel Lewinsohn ('23)**, **Surbhi Bhutani**, **Joshua Kalenga ('23)**, mathematics major **Marston Xue ('21)**. Faculty advisors also included **Drs. David Brown**, **Beth Malmskog**, **Dan Ellsworth**, **Jane McDougall**, and **Molly Moran**.



*Left to right: **Em Evans**, **Gwen Hardwick**, and **Liz Seero** who worked with **Dr. Janet Burge** with colleagues at U.C. Irvine on a collaborative project.*

Colorado College Hosts PPRUMC, 2021

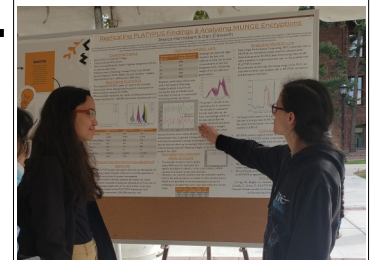
Colorado College was the site of the 19th Pikes Peak Region Undergraduate Mathematics Conference (PPRUMC). **Dr. Ike Agbanusi** and **Dr. Cory Scott** organized the conference, which took place virtually on Saturday, February 26th. In attendance were students and faculty from CC, USAFA, Front Range Community College, and Indiana University. We were very lucky to have a keynote presentation by a computer science ethics researcher **Dr. Casey Fiesler** from U.C. Boulder! Dr. Fiesler has a popular TikTok account and has gone viral for her shortform videos on ethical questions in computer science, and her keynote address fostered an in-depth conversation amongst conference attendees about these issues. Several CC students presented original work at this conference, including **Cooper Doe ('23)**, **Daniel Lewinsohn**, and **Emerson Worrell ('23)**. The conference concluded with a panel on careers in Mathematics and Computer Science that featured **Malcolm Gabbard ('19)**, **Lauren Stierman ('20)**, and **Roxanne Tutchtton ('12)**.



***Marston Xue** describes his research on **Topological Data Analysis**.*

Pi Mu Epsilon

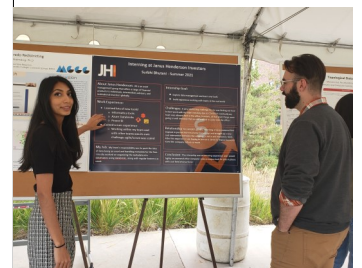
Pi Mu Epsilon is a national mathematics honor society whose purpose is the promotion and recognition of scholarly activity in the mathematical sciences. This year, the Colorado Epsilon chapter of Pi Mu Epsilon inducted 14 new members based on their interest and accomplishments in the field of mathematics. **Professor Emeritus Marlow Anderson**, as the honorary inductee, provided the keynote address for the induction ceremony. The 13 new student inductees were **Dominic Altamura ('22)**, **Olivia Bouthot**, **Lily Brazil ('23)**, **Jordan Cooper ('22)**, **Lilly Davis ('22)**, **Galileo Fries ('23)**, **Henry Jones ('23)**, **Oliver Li ('22)**, **Casmali Lopez ('23)**, **Na'ama Nevo ('23)**, **Emerson Worrell ('23)**, **Anni Zettl ('23)**, and **Yinting Zhong ('22)**. Congratulations to all 14 new members!



***Jessica Hannebert ('23)** explains her project to **Isabelle Waagenword ('25)**.*

Math Circle

In the spring, **Dr. Lauren Nelsen** launched an outreach program at Galileo Middle School in Colorado Springs called "Circles and Pairs." Each week the middle schoolers participated in both a Math Circle activity and tutoring in small groups. Math Circles are group problem-solving activities that emphasize creativity, collaboration, and discovery-based learning. The mission of this program is to address underrepresentation in math and science and to ultimately create pathways for underserved students in our community to become mathematicians, scientists, engineers, and programmers. This program, directed by **Dr. Mark Tomforde** from the Department of Mathematics at UCCS, gives students contact with faculty, graduate students and undergraduate students from both UCCS and CC, who serve as teachers and mentors. The tutors this year were **Sam Caro ('22)**, **Ella Engel ('23)**, and **Yvonne Zino ('22)**. Dr. Nelsen is working to continue this partnership with Galileo Middle School next year.



***Surbhi Bhutani** describes her internship to **Dr. Cory Scott**.*

Annual Awards in Computer Science

The **Steven Janke Prize** is awarded to a senior who demonstrates unusual talent and achievement. The award is shared this year by **Joshua Kalenga, Alex Zhu** and **Ella Neurohr** (pictured below).



The **Grace Hopper** award is given to a senior who demonstrates an unusual commitment to the CS community. This year the award is shared by **Ella Neurohr** (above), and **Em Evans** (below).



Holiday Party

On the last day of block 4, December 22, 2021, the Department participated in an outdoor version of our Winter Holiday Celebration. A number of faculty members and canines met in the Garden of the Gods at 1pm to enjoy the outdoors in weather which was forecast for sun and light cloud, and an unseasonably warm high of 56 °F. We walked through Rock Ledge Ranch, past the traditional farm area and animals without incident. We walked up the Galloway Homestead Trail, onto Chambers Trail and the Ute trail and took a turn through the Ridge trail with views of Cathedral Rock and the Sleeping Giant.

Following the walk, more Department members (people and canines!) joined in for food and drinks outdoors on the patio at Cerberus Brewing Company. The sun shone and the temperature even surpassed 60°F while Department members, canines and children enjoyed food and drinks in our first planned face-to-face gathering in more than a year. Our paraprofessionals rose to the challenge of providing a mobile-operated “app” that could be deployed off-campus to record bids on a limited number of rounds, and (re)assign gifts.



From left: Alex Wagner, Drs. Jane McDougall, David Brown, Shishir Agrawal, Lauren Nelsen, Molly Moran, and Minho Kim.

Building Community with Board Games

The pandemic saw many in-person traditions of the Math and Computer Science Department put on hold, from the winter celebration to the spring picnic. The 2021-22 school year was one of rebuilding in a number of ways, and one way that paraprofs Ely Merenstein and Alex Wagner moved



From left: Ely Merenstein, Alex Wagner and Davidson Cheng

to rebuild the fun, friendly math & C.S. community was by reinstating a blockly game afternoon, newly titled “Games and Greetings.” With help from the Game Club on campus, the paraprofs provided dozens of board and card games for attendees to play, along with packaged snacks that could be consumed outside the room when mask mandates required it. Although the eternal bustle of the block plan allowed only a few students to attend each event, those who did participate enjoyed memorably intense games, such as the round of *Catan* the paraprofs played with student Davidson Cheng ('23), depicted here. The paraprofs hope that the tradition continues into future years and gathers larger and larger groups for mingling and fun!

Phi Beta Kappa

The Phi Beta Kappa Honor Society recognizes high achieving students in the liberal arts who have demonstrated facility in a foreign language, and with abstract reasoning—students also uphold a high standard of integrity and personal conduct. This year computer science majors **Jessica Hannebert** and **Alex Zhu** ('22) were elected, as well as mathematics majors **Dominic Altamura**, **Albus Cao** ('22) and **Anni Zettl**.

ADEI in the Department

Our department has always put forth effort in creating a welcoming environment and inclusive spaces for our students, but during this past year we stepped up our efforts in Antiracism, Diversity, Equity, and Inclusion (ADEI). We initiated a blockly ADEI meeting for department faculty and staff to discuss a number of important topics, including equity in faculty hiring, inclusive teaching/grading practices, and focusing on ensuring that all students have an equal chance at success. **Dr. Molly Moran** and **Dr. David Brown** have been involved in creating the Quantitative Reasoning curriculum for CC's Stroud Scholars Program, a free three-year highly immersive college preparatory program to support local youth from communities historically excluded from higher education. **Dr. Cory Scott** and **Dr. Janet Burge** are participating in the "3C Fellows Program on Cultural Competence in Computing"—a two year program where participants are first given a grounding in work done by social scientists on race, racism, and education and then encouraged to use this as a foundation for curricular innovations. **Dr. Luis David Garcia Puente** and Math/CS student **Surbhi Bhutani** ('22) also served on CC's Anti-racism Committee, which evaluates the implementation and impact of CC's Antiracism Plan. **Dr. Garcia Puente's** anti-racism work extends beyond the borders of CC. He serves as a Faculty Mentor at The National Alliance for Doctoral Studies in the Mathematical Sciences and also serves as a mentor in the Latinx mathematicians research community. He currently collaborating with some early-career Latinx researchers on problems in fairness in optimization. **Casmali Lopez** ('23) was nominated by the National Alliance for Doctoral Studies in the Mathematical Sciences to be a fellow in the 2022-2023 Facilitated Graduate Admissions Procedure (F-Gap) program. To the best of our knowledge Casmali will be the first CC student to participate in F-Gap – Congratulations Casmali!

Euclid Awards

The Euclid scholarship aims to encourage and attract talented CC students to the fields of Mathematics and Computer Science. This award is possible due a generous gift from **John Tompkins** ('89) in 2009. Since then, additional gifts from alumni and friends of the department have allowed the program to expand, and this year we were able to offer 17 scholarships! The award is given competitively to promising freshman and sophomore students, many of whom have not yet declared their major. Decisions on making the awards are based upon "a student's academic merit and potential in the field." This year we received a record of 112 nominations from department faculty, resulting in a total of 61 applications from many very well qualified applicants. All faculty in the department weighed in on the applications, and the final difficult decisions were made by a faculty committee. We thank the many wonderful and deserving students who applied. Approximately half of students receiving awards were predominantly interested in computer science classes, and approximately half were interested in mathematics (oftentimes students were nominated more than once, and sometimes from both math and computer science). It is possible to receive the award more than once, and we also look forward to seeing some of our rising sophomore applicants reapply next year. We thank the generosity of our donors in making these awards possible.

Student Organizations

The mathematics student organizations continued to be an active part of the department this year. **Math Club**, the **Association for Women in Mathematics (AWM)**, and the **Society for Industrial and Applied Mathematics (SIAM)** organized blockly meetings with fun activities including Set tournaments, book club, and course selection advice. In addition to these regular meetings, we had one big event sponsored by these clubs in Block 6: the first ever Pi-K. In honor of Pi Day, participants from across campus gathered to walk, run, skip, bike, or scoot in a 3.14 km race around campus, where the route was in the shape of π , of course! Finishers received a T-shirt, and enjoyed delicious pie and fun pi-themed games sponsored by the Math and CS Department.

Euclid Scholars for 2022-23

First Year Students:

Porter Barnes
Joshua McFeeters
Mustafa Sameen
Isabelle Wagenvoord
Cathy Xiao

Second Year Students:

Tyler Chang
Trey Crawford
Simay Cural
Lucy Flanagan
Gwen Hardwick
John Le
Louisa Penrice
Calvin Than
Dani Santillan
Tiia Shea
Kaija van Zante
Harry Yao

Gifts

To make a gift to the Department, please visit our secure online giving site at

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**Office for Advancement,
Colorado College,
P.O. Box 1117
Colorado Springs,
CO 80901-9897**

Please include "Mathematics and Computer Science Department" in the memo line of your check, or include a note with your online gift. To support Euclid awards you can indicate "Euclid Scholarships Math & CS Dept."

Fearless Friday Award

All mathematics and computer science majors must attend at least four department talks, and produce a detailed summary for each. The 2022 award for best talk writeups went to **Dominic Altamura**. Congratulations Dominic!

Block Visitors

Special thanks to block visitors this year: **Dr. Rob Gordon** (statistics), **Dr. Richard Koo** ('82) (computer science), and **Dr. Nguyen Nguyen** (mathematical analysis). Our block visitors greatly enrich the department and without them we would not be able to offer the same breadth and depth of classes. We are grateful for their continued willingness to teach blocks and participate in and contribute to the life of the department.



Ely Merenstein



Alex Wagner



Lilly Davis

Tenure for Professors Burge, Malmskog and Moran

Earning tenure is one of the most important milestones in an academic career – a recognition of one's past accomplishments and future potential. This year, three (!) of our department's faculty were awarded tenure: **Dr. Janet Burge**, **Dr. Beth Malmskog**, and **Dr. Molly Moran**.

Dr. Burge is a computer scientist who studies the branch of software engineering known as design rationale, the process of capturing and using information about decisions that are made during software development. She earned her Ph.D. from Worcester Polytechnic Institute in 2005 and joined Colorado College in 2016.

Dr. Malmskog is a number theorist whose interests also include geometry, combinatorics, and algebra. Some of her recent work has looked at measuring the fairness of proposed legislative redistricting maps. She earned her Ph.D. from Colorado State University in 2011 and joined CC as a tenure-track faculty member in 2017 (she was previously a visiting professor 2012-14).

Dr. Moran ('09) is a topologist who studies relationships between geometry, topology, and algebra (and who never gets tired of the "doughnut versus coffee cup" joke). In addition to her theoretical work, she is interested in the new field of topological data analysis, which uses topological tools to study high-dimensional data sets. She earned her Ph.D. from the University of Wisconsin-Milwaukee in 2015 and joined CC as a visitor later that year, moving to the tenure track in 2017.

All three of these colleagues have made outstanding contributions to the college through their teaching, research, and service. We are incredibly fortunate to have their continuing presence for the long run. A special note of appreciation is due to our peerless office manager **Marita Beckett**, who did such great work putting the tenure files together concurrently with all the other tasks that keep our department functioning. Finally, thanks go to the many students and alumni whose letters about the three tenure candidates were invaluable.

Paraprofessionals, Past and Future

This year our paraprofessionals were as essential as ever for the day to day functioning of the department, and perhaps even more so as we contended with the new territory of coming back to an in-person setting while observing appropriate distancing requirements. Our paraprofessionals provided exceptional support. And no, the paraprofessional office candy did not ever go away! Students typically got the help they needed working through a calculus problem or programming construct with a paraprofessional, and then took their candy "to go".

Computer Science paraprofessional **Ely Merenstein** is already missed. He left a legacy of helpful programs, for example a prerequisite checker to determine appropriate prerequisites for students in a class list, a QR code scanning system for attendance at Fearless Friday talks to a holiday gift exchange mobile app process which was deployed with success at the off-campus holiday party in December. Ely is going on to become an Incoming Technology Development Program Associate at Optum in Washington D.C., starting in the fall. We wish Ely much success in his new position and ongoing career.

Our mathematics paraprofessional **Alex Wagner** came to us in 2021 from Santa Clara University, with a bachelors in bioengineering, as well as a masters degree! After a successful year as math paraprof at Colorado College, he is returning to fulfill the role of computer science paraprof for the next academic year. While Alex already had some experience in programming, he sat in on several computer science classes at CC during the year, and helped with some of the lower level classes. Alex also took an additional credit-bearing class in Java during the summer of 2022. We are fortunate to have Alex staying on for another year!

While Alex is returning, we will also have new mathematics paraprofessional **Lilly Davis** ('22) joining the department in 2022-23. Lilly (she/they) majored in both mathematics and political science. Their hobbies include going on walks, listening to (too many?) podcasts, and painting "badly" although with a lot of joy. They are deciding between law school, a post-graduate degree in history of math, and living debt free. Lilly states that she is "super excited to be next year's math paraprofessional and to be helping students discover a love of math."

Department Faculty 2021-22

Ike Agbanusi
 Shishir Agrawal
 David Brown (Co-Chair)
 Andrea Bruder (Assoc. Dean)
 Janet Burge
 Dan Ellsworth
 Stefan Erickson (sabbatical)
 Luis Garcia Puente
 Minh Kim
 Beth Malmkog
 Lauren Nelsen
 Jane McDougall (Assoc. Chair)
 Molly Moran
 Cory Scott
 Mike Siddoway
 Richard Wellman
 Matthew Whitehead (Co-Chair)

Department Staff 2021-22

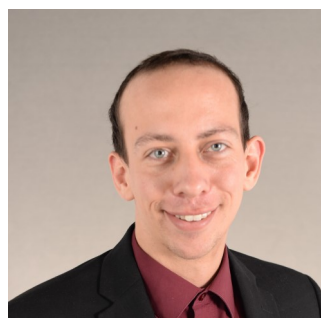
Marita Beckert (Office Manager)
 Ely Merenstein (Paraprof.)
 Alex Wagner (Paraprof.)
 Amy Pray (Tech. Dir.)



Dr. Ben Nye



Dr. Eddie Price



Dr. Joseph Rennie

New Faculty Joining the Department for 2022-23

The department is excited to welcome four new faculty. We are thrilled to welcome **Dr. Varsha Koushik** as a tenure-track professor of Computer Science! Varsha received her Ph.D. from the University of Colorado, Boulder in May 2022. As a Ph.D. student at CU Boulder, she received several prestigious fellowships, including a Provost's Fellowship and the Carol B. Lynch Fellowship. She has also worked extensively on behalf of underrepresented groups in Computer Science, both in the classroom and as a Graduate Student Representative. She studies human-computer interaction, and is passionate about issues of accessibility, especially for people with cognitive or physical disabilities. Her work in this area has been published in the ACM Conference on Human Factors in Computing Systems as well as the ACM SIGACCESS Conference on Computers and Accessibility, and has been featured several times in CU Boulder Today. In her spare time she likes to bake bread, cook, and "do all the standard Colorado things, like hiking"! Welcome, Varsha!



We also welcome **Dr. Ben Nye** for a visiting position in Computer Science. Ben comes to us from Northeastern University, where he studied how to aid medical research by summarizing studies with machine learning. Ben is also passionate about unpacking and fixing the ways that Natural Language Processing can reinforce sexist or racist social norms. He hopes to bring this ethical approach to machine learning classes he will be teaching at CC. He has already moved to the Springs, and he and his wife have recently welcomed their second child! Welcome, Ben!

Two new mathematicians will be joining us in fall 2022: **Dr. Eddie Price** and **Dr. Joseph Rennie**. **Eddie** earned his graduate degree in Mathematics at Purdue University, and attended Benedictine College before that. He comes to us most recently from Grinnell College, and so is no stranger to the liberal arts. Eddie's research interests are in commutative algebra. Eddie has a strong commitment to teaching all students, and particular interest and experience when it comes promoting equity and building inclusive environments for students in the LGBTQ+ community and for BIPOC students. **Joseph** has just completed his Ph.D. in mathematics at the University of Illinois. He obtained his undergraduate degree in mathematics from Reed College, so teaching in the liberal arts at Colorado College will be a sort of homecoming. Joseph's research interests lie in the logical foundations of mathematics, and he has also done interesting work in combinatorics and algebra. While in graduate school, Joseph served as a mentor for undergraduate research projects at the prestigious MSRI in Berkeley. One of his mentees was our own **Jerrell Cockerham** ('21), so Joseph has already had an introduction to CC students and their capabilities! Welcome Joseph! Welcome Eddie!

Gifts to the Department

Our students and faculty continue to benefit from the generosity of donors who contribute to our mission. This year we received two especially noteworthy gifts. First, a pseudo-anonymous donor provided funding to pay stipends to faculty who supervise student research projects in the summer. "Working with students on research is one of the most important and rewarding things that we do," says Dr. David Brown. "However, this work is usually uncompensated. Being able to pay faculty for the time that they devote to this task is important symbolically and practically."

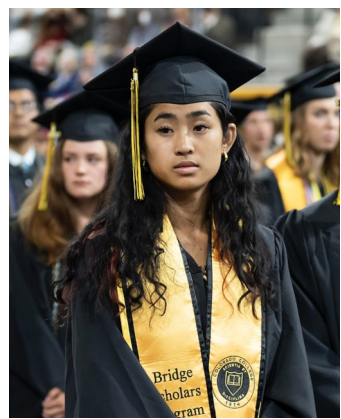
Second, the department received a gift of over \$400,000 from the estate of **Cora Grannis** ('34). Ms. Grannis was a labor economist who worked for several federal agencies. Her father, **Dr. Charles Sisam**, was a CC professor of mathematics (1918-1948). He was a noted teacher and scholar—follow the "History" link on the department's web page to learn more. The department is also honored to receive many smaller gifts each year, and the impact of these is substantial. Annual gifts allow us to provide extra resources for students and faculty. In recent years, these gifts have been used to do things as various as upgrade our audiovisual equipment for remote teaching, support faculty participation in workshops on diversity, and pay honoraria to visiting speakers. A heartfelt thank you to all of our donors!

Annual Awards in Math

The **Florian Cajori Award** in Mathematics honors a senior who demonstrates unusual talent, achievement, and interest in mathematics. This year's winner is **Marston Xue**, pictured below. Marston is heading to Washington University in St. Louis for graduate school in math next year!



The **Sophie Germain Award** is given to a student of mathematics whose passion for the subject is strong enough to overcome significant challenges. The award is shared by **Lilly Davis** and **Alayna Mann** ('22) (pictured below).



Prestigious Grant for Dr. Beth Malmskog

Dr. Beth Malmskog was awarded a \$250K grant from the National Science Foundation entitled: "LEAPS-MPS: Foundational Connections in Number Theory, Coding Theory, Graphs, and Fair Redistricting". This grant supports **Dr. Malmskog's** work in error-correcting codes with applications to robust cloud storage and private information retrieval, as well as mathematical/statistical techniques to help identify and quantify partisan gerrymandering.

Dr. Malmskog's previous work in these areas have involved many student researchers, including **Sam Kottler** ('18), **Haley Colgate** ('19), **Kadin Mangalik** ('19), **Edgar Santos Vega** ('20), **Jose Monge Castro** ('20), **Abigail Ezell** ('21), **Dominic Altamura** ('22), **Sam Caro** ('22), **Lilly Davis**, **Josmary Fernandez** ('23), **Joshua Kalenga**, **Casmali Lopez** ('23), and **Bright Throngprasertchai** ('22).

This grant also supports several activities to broaden the participation of students in mathematics and foster a vibrant research environment within the department. In Spring 2022, we held a **Collaboration Boost Seminar** series, where CC faculty members gave informal talks sharing their work and potential areas for collaboration within the department and college. This series was designed to create exciting and sustainable local collaborations on problems of wide interest, building a supportive research network for all faculty and future research students, but particularly for our many new and early-career faculty members. These collaborations were begun in earnest on a faculty retreat at CC's Baca campus in early June. Two faculty research projects are currently underway already in the summer of 2022! The award also supports the expansion of CC's Bridge Scholars program to include an additional 20 incoming first-year students in Summer 2023, as well as the development and teaching of a Bridge course in applied and computational discrete mathematics.



Faculty at the Baca camps retreat in June 2022

Dr. Luis Garcia Puente Named 2022 AMS Fellow

Dr. Luis David Garcia Puente joined the 2022 class of Fellows of the American Mathematical Society. He is one of 45 mathematical scientists from around the world to have been named an AMS fellow for 2022, and one of only nine AMS fellows in Colorado. The Fellows of the American Mathematical Society program, started 10 years ago, recognizes members who have made outstanding contributions to the creation, exposition, advancement, communication, and utilization of mathematics. **Dr. Garcia Puente** is being honored for contributions to applied algebraic geometry, including algebraic statistics and geometric modeling, and for broadening participation in the mathematical sciences. He is an active member of the SIAM Activity Group on Algebraic Geometry, the Latinxs and Hispanics in the Mathematical Sciences Community, the Society for Advancement of Chicanos/Hispanics and Native Americans in Science and The National Alliance for Doctoral Studies in the Mathematical Sciences. He has directed undergraduate research projects for 20 years, involving close to 100 undergraduate students in his work. **Dr. Garcia Puente's** research interests include computational and applied algebraic geometry, algebraic combinatorics and algebraic statistics. He received his Bachelor of Science in mathematics from the Universidad Nacional Autónoma de México and his Ph.D. from the Virginia Polytechnic Institute and State University. "It is an honor to welcome a new class of AMS Fellows and to congratulate them for their notable contributions to mathematics and to the profession," says **Dr. Ruth Charney**, president of the American Mathematical Society.



Joanna Colclough



Alan Yeung

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Melissa Jay

Fearless Friday Seminars

In Person Fearless Friday seminars started up again in the fall, after a hiatus of well over a year. In accordance with our social distancing policies, pizza and refreshments were served outside before talks began at 12:30 pm. Speakers were masked while presenting to a live audience, and the talks were simultaneously livestreamed. The speakers included Department Faculty **Drs. David Brown, Luis Garcia Puente, Minh Kim, Jane McDougall, Lauren Nelsen, and Cory Scott.** Visiting speakers included computer scientist **Dr. Barry Fagin** - Senior Associate Dean of the Faculty of the United States Air Force Academy, and **Dr. Jonathan Poritz** of CSU Pueblo, who recently retired and relocated to Italy with his wife Kathy Giuffre from the CC Sociology department. World-renowned 3D printing expert **Dr. Henry Segerman** of the University of Oklahoma gave a Zoom talk that drew an interdisciplinary, and inter-division audience. We had two student-led Fearless Fridays, with a fall Student Poster Exhibit, featuring research by students from the summer of 2021, and presentations by the modeling teams after they competed in the spring of 2022. Two notable talks were given by department alumni, namely **Alan Yeung ('16)**, and **Joanna Colclough ('13) (née Tebin)**, graduated with distinction in economics and a major in math in 2013. She was inspired by another CC graduate, **Tra Ho ('08)** to try the actuarial profession. Tra has been working as an actuary in the DC area for a number of years now, and Joanna became a fully certified actuary after passing her final exam last December. Joanna has worked with Anthem in Denver for the past four years. Joanna gave the audience a detailed description of the actuarial track, and went into detail on some of the exam questions that relate to material covered in our courses MA313 Probability and MA417 Mathematical Statistics. She also alerted students to some generous summer internships that give students a chance to explore the actuarial profession, while being compensated relatively well. Read on to learn more about Alan's visit!

Alan Yeung Homecoming Speaker

Alan Yeung ('16) double majored in both Economics and Computer Science, and graduated Summa Cum Laude. He worked his way to the position of Senior Full Stack Engineer and Team Lead at Lockheed Martin, located in the Denver area. In October 2021, Alan graciously agreed to be our homecoming speaker. He described his work at Lockheed Martin, and gave some excellent advice on advancing in the career path and advice. Full-stack engineers work on code at all levels throughout larger systems, so they have to have knowledge of lots of different components/frameworks and how it all fits together. It was interesting and informative for our current students and all of us to hear Alan's story about transitioning from being a student into the professional world; our students now have further insight into how they might apply their own computing expertise upon graduation. Alan's years with Lockheed Martin recently drew to a close, when he began a new position as Senior Software Engineer at Twilio, a smaller company that is also in the Denver area. Interestingly his company had adopted a permanent "remote work" environment. Alan still enjoys many of the same hobbies he had as a student: fly fishing, programming, and reading! After Alan's talk, department faculty and staff enjoyed a meal at a downtown restaurant, sitting outdoors together. For many of us this was the first face-to-face gathering in many months!

Where are they Now? Alumni News

Melissa Jay ('16) recently completed her Ph.D. in Biostatistics at the University of Iowa and will be starting as an Assistant Professor of Biostatistics at the University of Alabama at Birmingham this summer. While at Iowa, Melissa developed statistical methods that can help researchers understand differences in cancer risk at the ZIP code level. She was also a lab instructor for the Iowa Summer Institute in Biostatistics, which introduces undergraduates to the field of biostatistics. Melissa is so grateful for her experience as a math major at CC -- from collaborating on problem sets in our department lounge to presenting at conferences with the SIAM chapter, she felt well prepared and ready to take on graduate school.

Where are they Now? Alumni News (continued)

After graduating from CC, **Ravi Donepudi** ('13) went to the University of Illinois where he studied arithmetic geometry and had a blast teaching students calculus and linear algebra. He is now working as a capital market quantitative analyst at Goldman Sachs building models to price various monetary instruments. He has fond memories of doing a lot of fun math in our department lounge, and he fondly remembers the generosity with which the CC professors shared knowledge with him.

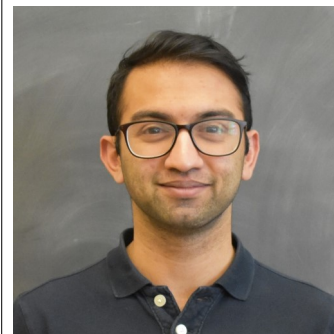
Courtney Gibbons ('06) continues to enjoy Hamilton College. She was recently selected from many applicants across the STEM fields to serve Congress as an American Association for the Advancement of Science (AAAS) **Science and Technology Policy Fellow**. She will spend a year on Capitol Hill, advising Congress on policy and legislation, working either with a Member of Congress or on a Congressional Committee. Courtney encourages students and faculty alike to consider participation in AAAS programs, to advocate for bringing scientific viewpoints into politics.

Haley Colgate ('20) is in the Ph.D. program in Applied Mathematics at University of Wisconsin, Madison. She works with **Dr. Amy Cochran**, using probability and algebraic statistics to model human decision making. She passed her last qualifying exam this spring, and is looking forward to getting more into research. This summer she will use mathematical modeling for a literature review on approach-avoidance conflicts.

Sam Kottler ('19) is in the PhD program in Computer Science at University of Wisconsin at Madison. He is getting started with some work on operating systems, specifically emerging non-volatile memory technologies. He has an internship for the summer and will work remotely to attend research meetings on campus. The department also congratulates Sam and Haley on their upcoming wedding, scheduled for this summer in their home state of Utah!



Dr. Courtney Gibbons



Dr. Ravi Donepudi



Sam Kottler, Haley Colgate

Farewell to Drs. Shishir Agrawal and Richard Wellman

Drs. Shishir Agrawal and **Richard Wellman** have spent four years in our department.

Dr. Wellman will be missed by faculty and many students (and even staff!) who learned the java and python programming languages from Richard. He will also be missed for his stradi-caster performances! We wish **Dr. Agrawal** the best for his bright-looking future, which takes him to a post-doctoral research position at the University of California, San Diego (UCSD) starting in the fall of 2022.

Faculty on Sabbatical

This past Fall, **Dr. Flavia Sancier-Barbosa** had her pre-tenure sabbatical. She worked with **Dr. Roxaneh Khorsand** from the Organismal Biology and Ecology department, on "The effects of experimental warming on plant-pollinator interactions and floral rewards in the Low Arctic." She also worked with **Dr. Sharon Flicker**, from CSU Sacramento, on both: "Personality Predictors of Attitudes, Willingness to Engage, and Actual Engagement in Consensual Non-Monogamy" and "Factors that predict compersion."

Dr. Janet Burge will be on a full year sabbatical starting in the fall. "Meetings are a necessary part of working life, but having too many meetings that are inefficient or unproductive can be a big obstacle to productivity. During the next year, Janet will spend her sabbatical working on a project with researchers at UC Irvine to analyze videos of actual software design meetings supplied by an industry partner to determine what works, what doesn't work, and how software support tools could be built and used to improve meeting efficiency and effectiveness."

Dr. Beth Malmskog is starting off her sabbatical with a few mathematical trips, including a week at the Institute for Computational and Experimental Research in Mathematics and two weeks at the Park City Mathematical Institute. This fall will likely include a few weeks in Hungary visiting the Renyi Institute. She plans to focus on research in fair redistricting, error-correcting codes, and computational number theory during this sabbatical year. Beth will also spend time with friends and family, dusting off her accordion, running, biking, and camping with Archer.



Dr. Shishir (Sunny) Agrawal



Dr. Richard Wellman