The Colorado College Department of Mathematics and Computer Science

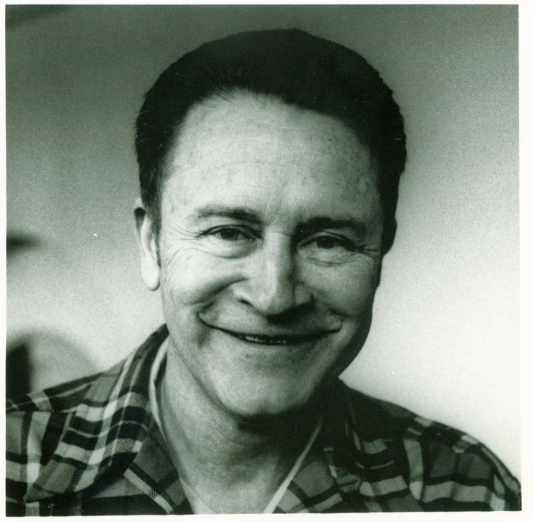
Volume 14, Issue 1

May 2020

COUNTABLE BITS

INSIDE THIS ISSUE:

GEORGE SIMMONS PASSES AWAY



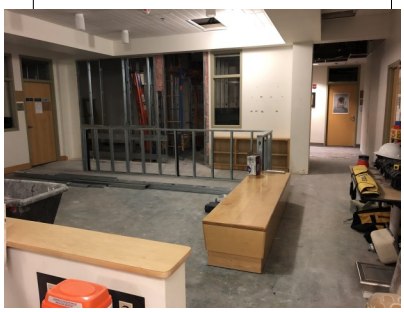
Professor Emeritus George Simmons, especially distinguished for his successful calculus text, passed away on August 6, 2019 in Colorado Springs at age 94. He joined Colorado College in 1962 after finishing a Ph.D. at Yale University and teaching at a variety of institutions including the University of Chicago. Professor Simmons studied classical analysis and ended up with rather strong opinions and high standards concerning a solid education in mathematics. His response to what he considered the awful state of education was to write textbooks covering topology, differential equations, and calculus. Both his calculus and his differential equations texts were particularly successful and were published in additional editions as well as translated into several languages. (The differential equations text went into a third edition 28 years after the second edition came out.)

Professor Simmons had a special knack for clear and direct mathematical exposition. His books are a pleasure to read and include many historical notes scattered along the way. In fact, many of his short biographies of mathematicians plus key mathematical "gems" were collected in a shorter book called Calculus Gems. Arguably, every mathematics student should take a look at this book at some point. Of course, Professor Simmons' penchant for clear exposition also infused his class lectures and guided many students through calculus.

George taught in the Mathematics Department from 1962 to 1990 when he retired. He was known for his ever present bolo tie, his displeasure with the block plan, his strong support for anything Gauss did, and his tongue-in-cheek posting of office hours from 12:00 to 12:05. After retirement, he traveled extensively and enjoyed his complete collection of Life magazine along with his vast collection of current movies. As a fan of great literature, he was reading Crime and Punishment for the fourth or fifth time a few months before he passed away. Professor Simmons will be remembered for the long-term recognition (national and international) he brought to the college over the years.

DISTANCE LEARNING AT CC

Colorado College, like everyone else, has had to adjust to the Corona Virus pandemic this spring. Students were sent home, and regrettably many traditional and much anticipated events and activities were cancelled, including commencement ceremonies for the Class of 2020. Courses scheduled for blocks 7 and 8 (and for the Summer Session) went on, but taught in a distance-learning format. Members of the Math and Computer Science Department took on the challenge of teaching all of our courses with help of such electronic tools as Zoom and Webex, our staff faced many difficult problems with aplomb, and our paraprofessionals managed electronic office hours to help out students. Faculty tried hard to bring as much of the personal touch to these courses as possible. While many of our students were in the Rocky Mountain West, faculty had to adjust their approaches to accommodate students enrolled in our courses, while located physically in places all over the world. While learning many new things in the process, both students and faculty are looking forward to the resumption of face-to-face teaching, presumably in the fall semester.



DEPARTMENT REMODELING!

We are growing! The enrollment in Mathematics, Computer Science, and Statistics courses has grown to more than 1600 students per year, and with it so has the size of the department. Currently, the department has 19 professors and three block visitors teaching 85 blocks in 2019-20. Toward the end of last academic year, this had resulted in pressing need for additional office space. Andrea Bruder (chair) and Marita Beckert (office manager) worked with the Dean's and Provost's offices and CC Facilities to remodel part of the second floor of Tutt Science to create two new offices and give the lounge area a make-over. Everyone is looking forward to enjoying the new spaces again in the fall!

RAWLES EXAM

The 49th Annual Rawles Prize Competition was held on February 25, 2020. Several students took the 3-hour, 6-question Rawles exam and performed admirably. The top two scores were earned by upper division winner John Koerner and lower division winner Davidson Cheng. John is a junior mathematical economics major, and Davidson is an undeclared first year. Congratulations, John and Davidson!

PUTNAM EXAM RESULTS

This year's Putnam Competition took place on Saturday, December 7, 2019. The Putnam exam is an annual competition for undergraduates in the United States and Canada. The day-long exam consists of twelve very challenging math problems. Colorado College had seven students participate this year. Vladi Vintu placed in the top 10% of all participants, and Colorado College was in the top 20% of all institutions. Congratulations to all our Putnam participants!

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 the mathematics behind the television show *NUMBERS*, an introduction to Poker, and a mini Estimathon. In addition to these regular meetings, we had one big event sponsored by these clubs in Block 6: the first annual Integration Bee.
This competition challenged teams of students to display their integration skills during two fun rounds of play. Five teams competed and the team with students Casmali Lopez and Tim Somerset took first place. Congratulations!

The Integrators! (from left to right): Anna Xu, Oliver Li, Tom Wan, Luis Ramos, Edgar Santos-Vega, Olivia Bouthot, Tony Mastromarino, Moises Padilla, Tim Somerset, Casmali Lopez, John Koerner, Haley Colgate, Trillian Fan

Paraprof Aiken and Professors Moran & Agbanusi during the Integration Bee

PI MU EPSILON!

Pi Mu Epsilon is a national mathematics honor whose purpose is the promotion and recognition of scholarly activity in the mathematical sciences. This year, the Colorado Epsilon chapter of Pi Mu Epsilon will induct five new members in Block 8 based on their interest and accomplishments in the field of mathematics. The new inductees are Ruixin (Albus) Cao, Samuel LeBlanc, Hanqing Li, Lauren Stierman, and Yunhui (Marston) Xue. Congratulations!

MOLLY MORAN WINS TEACHING AWARD

Each year, the Rocky Mountain Section of the Mathematical Association of America presents an Early Career Teaching Award for an un-tenured faculty member at a college or university in the Rocky Mountain region. This year we are very pleased to report that our own Molly Moran has won this award. Molly was a 2007 graduate of CC, and then went on to complete her Ph.D. in geometric topology at University of Wisconsin Milwaukee. Molly was hired as a visiting professor in our department in 2015, and was appointed in a tenure-track position in 2017. She is an accomplished and admired teacher in our department, continues her productive mathematical research career, and has played a vital role in encouraging our department's student organizations.

Students at the Joint Math Meetings

The largest mathematics conference in the world was held very close to home this year: Denver, Colorado. The Denver Convention Center was home for several days to thousands of mathematicians from across the country and world. There were many great talks, including talks by current and former CC students and CC faculty members.
On Thursday evening many CC folks at the meeting gathered for dinner. Professors Marlow Anderson, Andrea Bruder, Kirsten Hogenson, Molly Moran, and John Watkins were joined by CC alums Denali Molitor, Hanson Smith, Ravi Donepudi, Nate Mankovich, and Malcolm Gabbard, current CC students Makayla McDevitt, Margie Knight, and Haley Colgate, and this year's paraprofessionals Sophie Aiken and Sam Kottler. It was a great evening to catch up and see familiar faces.

Here is one table at this year's reunion. In addition to CC faculty **Andrea Bruder**, **Marlow Anderson** and **Kirsten Hogenson**, this picture features recent CC math graduates now in graduate school. They are **Nate Mankovich** (Colorado State), **Hanson Smith** (CU Boulder), and **Denali Molitor** (UCLA),

SENIOR AWARDS

Each year the department gives the **Florian Cajori Award**, honoring a student who has demonstrated unusual talent, achievement and interest in mathematics. This year the department had four such outstanding students that it decided that it would give the Cajori award to each of them. These honored students are **Haley Colgate**, **Cinea Jenkins**, **Hank Li** and **Vladi Vintu**, The **Steven Janke Award in Computer Science** goes to the student who best demonstrates unusual talent and achievements in CS; this year's winners are **Daniel Barnes** and **Nicole Woch**. The **Grace Hopper Award** in CS goes to the student who best demonstrates an unusual commitment to the CS community, and the winners this year are **Darryl Filmore** and **Daniel Barnes.** In addition, **Edgar Santos Vega** received the **Sophie Germain Award**, which honors the mathematics student "who demonstrates an unusual commitment to the mathematics community" and "passion for the field." And **Yiwen Tang** won the **Fearless Award**, for the best talk write-ups of the year.

Graduating Majors, 2020

Mathematics:

Albus Cao
Haley Colgate
Xinling Dai
Trillian Fan
Joe Gustadt
Cinea Jenkins
Yifan Ji
Selma Jukic
Sam LeBlanc
Hanqing Li
Xingtong Liu
Kadin Mangalik
Edgar Santos Vega
Lauren Stierman
Yiwen Tang
Vladimir Vintu
Adrian Ward
Ruyi Wang

Computer Science:

A.W. Antonoff-Wertheimer
Daniel Barnes
Kobi Bhattacharyya
Emma Blair
Clifford Chirwa
Sarah Dunbar
Ada Feng
Darryl Filmore
Meredith Fossitt
Aymeric Foyer
Pietro Giacomin Sanou
Elise Glaser
Isabel Gutierrez
Magdalena Horowitz
Oliver Jones
Ben Kirchman
Nikhil Kovelamudi
Tian Lee
Logan Pepperl
Paul Price
Aidan Prior
Sophia Quick
Alex Rehorst
Jon Roddy
Ian Sanborn
Ben Seitz-Sitek
Drew Shippey

Mathematical Economics:

Claire Altieri
Alexander Blackburn
Amanda Franks
James Green
Natalie Gubbay
John Koerner
Zachary Levy
Avery Melville
Maitreyi Menon
Benjamin Murphy
Emily Ng
Kelly Nguyen
Tianyi Qin
Sean Stem
Xinyue Wang
Qizhen Yang

GIVING TO THE DEPARTMENT

To make a gift to the Mathematics and Computer Science Department, please visit our secure online giving site at www.coloradocollege.edu/giving. Or you can mail your check or money order, payable to Colorado College, to:
Office for Advancement
Colorado College P.O. Box 1117
Colorado Springs, CO 80901-9897
Please include the designation "Department of Mathematics and Computer Science" in the memo line of your check, or include a note with your online gift. You may choose an existing fund (e.g., Euclid Fund or Department Fund) as a designation, or contact Andrea Bruder (Chair, 719-227-8216) to discuss new ways to support the Mathematics and Computer Science Department.
The Euclid Fund has been entirely funded by alumni gifts, and supports the Euclid Scholarships (see story on following page), and also funds undergraduate summer research at CC; $2000 would support one student's project.

KATY MARTINEZ IS HOMECOMING SPEAKER

The department has developed a tradition of inviting an alum to deliver our Fearless Friday talk on Homecoming Weekend. This year, we were delighted to host Katy Martinez ('15). Katy is a Ph.D. student in applied math at Colorado School of Mines, funded by a prestigious fellowship from the National Science Foundation. In her talk (titled "Cultivating a Mathematical Toolbox"), Katy described the research that she does with colleagues at Mines and at Los Alamos National Laboratory, modeling the spatio-temporal dynamics of Ebola outbreaks in Africa. Katy's work draws on techniques from differential equations, stochastic simulations, and statistics. In addition to her talk, Katy visited a class, met with current students to discuss graduate school, and reminisced with faculty and staff. Thanks, Katy – it was great to see you!

STUDENTS PRESENT AT PPRUMC

Every year students present their research at PPRUMC, the Pikes Peak Regional Undergraduate Mathematics Conference. This conference is held at a college or university in the Pikes Peak region every spring, and we usually have a good turnout of CC students. Here's a photograph of the CC team this year (missing Sam LeBlanc). Faculty member Stefan Erickson, Harry Wang, Lauren Stierman, Cinea Jenkins, Math Paraprofessional Sophie Aiken, Edgar Santos Vega, and Margi Knight.

Euclid Scholarships

This year the department was able to award 12 Euclid scholarships, which are given to first and second year students who show unusual talent and interest in mathematics or computer science. The scholarships are paid for with a fund supported by the generous donations of our alumni.

This year the winners were: Sophomores: **Dominic Altamura**, **Stephen Sigman, Marston Xue** First years: **Lena Fleischer, Miranda Hunter, Joshua Kalenga, Daniel Lewinsohn, Tony Mastromarino, Liz Seero, Na'ama Nevo, Emerson Worrell, Yingting Zhong.** Congratulations to all!

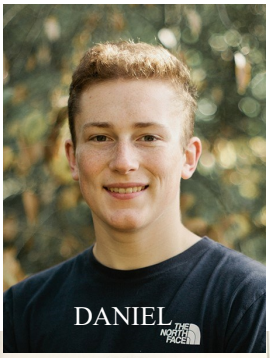
Faculty Scholarship in 2019 and 2020

Agrawal, S. (2019), Deformations of overconvergent isocrystals on the projective line, Journal of Number Theory.
Anderson, M. (2019) (with C. Hollings and R. Wilson), Mathematics Emerging: From Colorado to Oxford, PRIMUS 29, 461-473.
Bruder, A. (2019) Modeling Transport in Streams (with **M. Kummel**), PRIMUS 29.
J. Burge (2019) (with M. Vierhauser, J. Cleland-Huang, P. Gruenbacher), The Interplay of Design and Runtime Traceability for Non-Functional Requirements, the International Workshop on Software and Systems Traceability, Montreal.
Ellsworth, D. (2019) (et al.), Performance Prediction for Power-Capped Applications based on Machine Learning Algorithms. In High Performance Computing and Simulations (HPCS).
Ellsworth, D. (2019) **(**with D. Radke and A. Hessler), FireCast: Leveraging Deep Learning to Predict Wildfire Spread. In International Joint Conference on Artificial Intelligence.
Hogenson, K. (2020) (with T. H. McNicholl, K. Frank, J. Roat and M. P. Carlson), Improving student success and supporting student meaning-making in large-lecture precalculus classes, PRIMUS 30.
Kelley, A. (2020) Subgroup growth of all Baumslaug-Solitar groups, NY J. of Math, 218-229.
Malmskog, B. (2019) (with R. Pries and C. Weir) The de Rham Cohomology of the Suzuki Curves, Arithmetic geometry: Computation and Applications, Contemporary Mathematics Series, 105-120.
Malmskog, B. (2019) (with K. Haymaker), What (Quilting) Circles Can Be Squared? Math. Mag. 92, 173—186.
Moran, M. (2019) (with C. Guilbault and C. Tirel), Boundaries of Baumslag-Solitar Groups. Algebraic and Geometric Topology, 19, 2077-2097.
Moran, M. (2019) (with C. Guilbault), Proper homotopy types and Z-boundaries of spaces admitting geometric group actions, Expositiones Math. 37, 292-313.
F. Sancier-Barbosa, F. (2019) (with M. McDevitt, L. Siriwardena, D. Ellsworth), Empirical Testing of an Option Pricing Model with Memory. Proc. Joint Statistical Meetings, 1575-1579.
F. Sancier-Barbosa, F. (2019), Defending with Two or Three Dice: What are the RISKs? Proc. Recreational Mathematics colloquium VI.


MARSTON


YINGTING

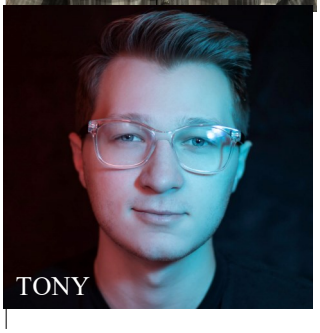
Some of our Euclid Scholars


DANIEL


LIZ


JOSHUA


EMERSON


TONY

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Visit our website: www.coloradocollege.edu/academics/dept/mathcs/

Math and Computer Science Faculty (2019-2020)

Ike Agbanusi
Shishir Agrawal
Marlow Anderson
Andrea Bruder
Janet Burge
David Brown
Dan Ellsworth
Stefan Erickson
Kirsten Hogenson
Andrew Kelley
Beth Malmskog
Molly Moran
Jane McDougall (on sabbatical)
Nguyen Nguyen
Flavia Sancier-Barbosa
Mike Siddoway
Richard Wellman
Matthew Whitehead
Benjamin Ylvisaker

Departmental Staff

Marita Beckert (Office Manager)
Sam Kottler (Paraprof.)
Sophie Aiken (Paraprof.)
Amy Pacheco (Tech. Dir.)

Molly's Sabbatical!

Professor Molly Moran will take a semester sabbatical during the Fall. Molly will take several research trips to work on different projects with collaborators at the University of Wisconsin-Milwaukee, Colorado State University, and the University of Tennessee Knoxville. She hopes to finish up some current projects on boundaries of groups and begin a new project in Topological Data Analysis.

Mathematics for Sustainability

Mike Siddoway has returned to the department after serving 5 years in the Dean's Office. While on sabbatical in 2018-2019 at Montana State University, Mike developed a new course entitled "Mathematics for Sustainability" that he taught as a MA110 "Mathematical Explorations" offering in Block 5 this spring. Twelve students completed the class which satisfies the "quantitative reasoning" requirement and is under consideration for the new "Formal Reasoning and Logic" designation that will be part of the new General Education Requirements that will go into effect next year. Students studied stocks and flows, Fermi estimations, equilibrium states, networks, exponential and logistic growth models and the mathematics of tipping points. The class will be taught again in the Fall of 2021, perhaps as a CC100, a new set of courses roughly taking the place of the old FYE requirement.

Paraprofs Old and New!

Each year we welcome two new paraprofessionals to the department, and this year we are very excited to introduce Cinea Jenkins as the math paraprof and Darryl Filmore as the CS paraprof. These two women are extremely accomplished in their fields and will bring both expertise within math and CS as well as excitement for supporting our students and the department when they enter the jobs next fall. In addition to their academic pursuits, Cinea will be working towards acquiring her motorcycle license and writing a book, and Darryl is going to continue to develop her interest in the crossover between metalwork and jewelry making as well as learning the art of glass blowing! As our new paraprofs take the torch, we say goodbye to the 2019-20 math and CS paraprofs, Sophie Aiken and Sam Kottler, respectively. Sophie will be starting her mathematics PhD at the University of California Santa Cruz in the fall, and Sam will be heading to the University of Wisconsin - Madison to pursue a PhD in Computer Science. Sophie and Sam are excited to start representing the Banana Slugs and the Badgers, but they will always be Tigers at heart. Good luck to our new paraprofs!

CC students study in Budapest

This year CC sent 6 students to study in the Budapest Semester Programs in math, math education, and computer science. The students were Abigail Ezell (math ed), Jerrell Cockerham (math), and Kate Barnes, Eliana Neurohr, Josephine Stevens and Madeline Strasser (computer science). In addition, math major Ying Wang is spending a semester of study in Moscow!

Goldwaters!

This spring the department received the happy news that two of our students will be receiving the prestigious Goldwater Scholarship. The nationally competitive scholarship is given annually to sophomores and juniors who intend to pursue careers in the natural sciences, mathematics, and engineering. Math major Jerrell Cockerham and Allie Kreitman (Molecular Bio major and Math Minor) both received the scholarship, the first time in memory that CC got two scholarships in the same year.