University of Colorado **Boulder**
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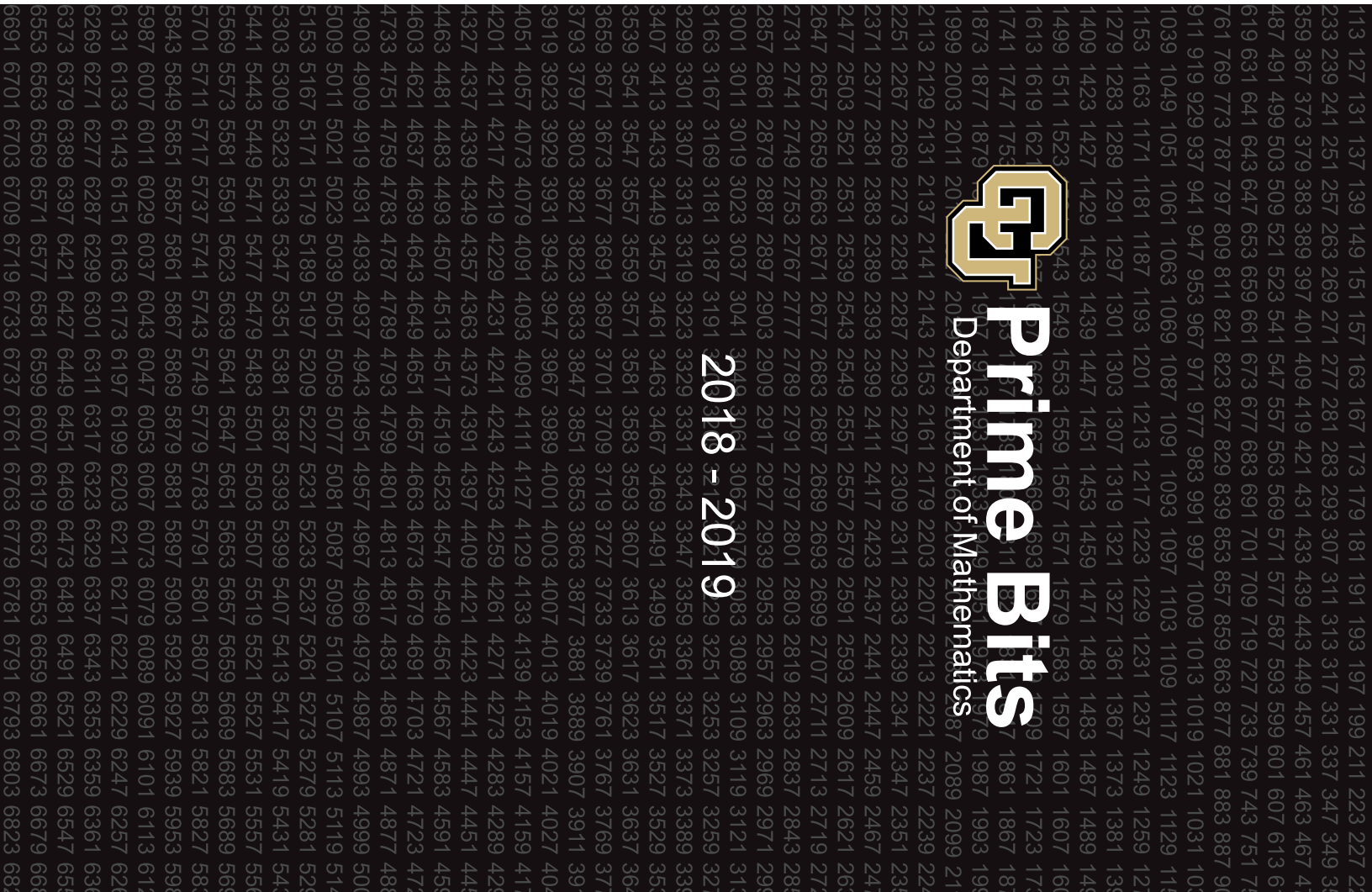
This issue of Prime Bits is edited by Professor David Grant, working in concert with designer Leon Romero. It is available in electronic format at math.colorado.edu/alumni. If you would prefer to receive only the online version in the future, please just drop us an email at mathalumni@colorado.edu.

In any format, we will endeavor to keep our loyal alumni and friends abreast of what's going on at their alma mater, and express our gratitude for what their continuing support has meant for the Department and its continuing generations of students.

Be Boulder.

University of Colorado **Boulder**



Prime Bits

Department of Mathematics

Chair's Communiqué

Alexander (Sasha) Gorokhovsky

Last year I detailed for you many of the changes we made to improve our undergraduate education. In this year's PRIME BITS you'll read how the rest of the world has taken notice!

Three of our excellent educators won major teaching awards this year: Professor Jeanne Clelland won both the campus-wide Boulder Faculty Assembly Excellence in Teaching and Pedagogy Award, as well as the regional Burton W. Jones Distinguished Teaching Award from the Rocky Mountain section of the Mathematical Association of America. Professor Eric Stade won the nation-wide 2018 American Mathematical Society Award for Impact on the Teaching and Learning of Mathematics. Finally the Primes Bits editor, Professor David Grant, was named a President's Teaching Scholar, the University's highest teaching honor.

Last year I told you about Professor Katherine Stange receiving the great honor of being awarded the prestigious NSF CAREER award (one of only a few dozen nationwide in all the mathematical sciences). In this issue of Prime Bits you can read about how Stange used her award to set up an innovative Experimental Mathematics Lab and how it's changing the life of some of our undergraduates.

You can also read this year about our expanded and revitalized Mathematics Resource Center (MARC) which assists math undergraduates across campus in their studies – and is building community for all our students.

Not resting on our laurels, several of our faculty got involved this year in the campus's Teaching Quality Framework Initiative (https://www.colorado.edu/teaching-quality-framework) to better improve instruction.

On the research front, the department continues to make strides, and you'll read inside about grants and awards that our faculty has earned. Our colleague, Professor Markus Pflaum has teamed up with a colleague in Physics to run a new Mathematical Physics Seminar. Pflaum has a great track record of interdisciplinary work, previously designing a summer course to prepare students for quantum mechanics and running a special topics course on topological chemistry.

Importantly, this year the department went through a robust discussion about future priorities, to enable us to train our students in the emerging fields of twenty-first century mathematics.

There were several excellent proposals about possible directions, and we decided to build a new research emphasis in stochastic and deterministic partial differential equations, bridging existing strong research groups in probability and differential geometry.

As always, I would be remiss if I didn't thank our alumni and friends for their tremendous outpouring of support this year. Indeed, now that I have been chair of the department for a while, I understand well how it is your generosity which allows us to continue to innovate and provide opportunities for our students.

A special thanks goes to Marlene Pratto, whose generosity has greatly expanded our ability to offer the Marlene Massaro and David Pratto Scholarships in Mathematics. These scholarships are awarded annually to an exceptional upper-level undergraduate Mathematics major.

Special thanks are also due to the friends and family of our beloved late colleague Rich Laver, whose generosity has similarly enhanced our ability to fund graduate student education via the Richard Laver Graduate Fellowship.

Department Research News

This year the department brought aboard two new two-year Burnett Meyer Postdocs, Drs. Yuhao Hu and Zheng Zhang. They join Drs. Farid Aliniaeifard and William DeMeo, who are in the second year of their tenure as Meyer postdocs.

Yuhao got his PhD in 2018 from Duke University in differential geometry and is being mentored by Professor Jeanne Clelland. Zhang earned his PhD in 2014 at Stony Brook University, working in algebraic geometry, and has previously been at Texas A&M. He is being mentored by Professor Yano Casalaina-Martin.

Postdoctoral Fellows are crucial for the research life of the department and expose our students to the very latest in mathematical progress. The funding for them comes from a generous bequest by our former colleague, Burnett (Bernie) Meyer, and from support of the College.

The Department has two Ulam Visiting Professors this year: algebraic geometer Dmitry Kaledin of the Steklov Institute of Mathematics (who is visiting Professor Sebastian Casalaina-Martin), and non-commutative differential geometer Piotr M. Hajac of IMPAN (who is visiting Professor Alexander Gorokhovsky). Ulam Visiting Professors are esteemed mathematicians from around the world who come to our Department for a semester to teach a course and add to the research life of the Department. They are named in honor of the great Stanislav Ulam, who was a professor (and later Chair) in our Department in 1961-62, and from 1965-75.

The Department hosted three conferences this past year, its first annual Geometry & Analysis Day, hosted by faculty Magda Czubak and Jeanne Clelland, and a 5-day international conference, Chromatic Homotopy Theory: Journey to the Frontier. Nearly a hundred participants attended the event focused on a subfield of algebraic topology, colorfully called "chromatic homotopy theory", one of whose main goals is to describe patterns in the space of maps between higher dimensional spheres. The local organizers, faculty Agnès Beaudry and Markus Pflaum, were joined by Dylan Wilson from the University of Chicago and Michael Hill from UCLA. The event was filmed and videos are now available at https://math.colorado.edu/chtjourney/ The conference was sponsored by an NSF grant, and a CU Boulder internal grant.

Also this year, graduate student Hanson Smith worked with a co-sponsor at Colorado State University to inaugurate the first annual Front Range Number Theory Day. This is a new semi-annual one-day conference, alternating between a fall meeting in Fort Collins and a spring meeting here in Boulder.

Professors Agnès Beaudry and Markus Pflaum organized the second annual Topology Day. The event consisted of talks in the field of algebraic topology, followed by a dinner at the Dushanbe Tea House, to which all graduate students and faculty from the department were invited. The event was sponsored by the NSF, the Simons Foundation, and a departmental account (funded with donations from our alumni and friends).

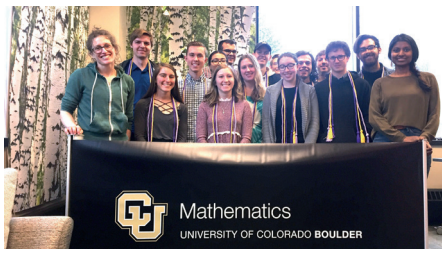
Undergraduate News

The Math Club, dubbed "QED" — standing for Quest, Explore, Discover — is being run by Dr. Divya Vernerey with the help of Professors Agnès Beaudry and Jeffrey Fox, and — with its many faculty talks aimed at undergraduates — is very popular with our math majors and minors. You can follow its activities at https://math.colorado.edu/mathclub

The Math Club also co-sponsors (with the MARC) our Department's annual Pi Day (3/14) celebration. This year, as always, it was a transcendental day for those acting irrationally.

In 2018 the Department had 30 of its students inducted into the local Pi Mu Epsilon's (PME) Chapter. PME is an honor's math society which recognizes undergraduate achievements.

Our Summer REU program continues to thrive under the able leadership of Professor Nathaniel Thiem. Summer 2018 had 50 undergraduate applicants,



New PME inductees bookended by faculty Agnès Beaudry and Divya Vernerey

and we were able to fund 18 undergraduates and eight first-year graduate students. We had seven different projects mentored by A. Beaudry, S. Casalaina-Martin, S. O'Rourke, M. Pflaum, K. Stange, N. Thiem, and J. Wise, covering a broad swath of mathematical disciplines. This year we also had a senior graduate student (H. Smith) co-advise one of the projects with K. Stange.

The Boulder Chapter of the Association for Women in Mathematics (AWM) — a joint effort of the Departments of Mathematics and Applied Mathematics — is now in its third year. Our Department's AWM leader, graduate student Krisztina Dearborn, reports that the Chapter continued its work to foster a strong, supportive community for women on campus, sponsoring community coffee hours, undergraduate study sessions, and STEMinist reading group meetings.

This year's main event was a discussion with the visiting Dr. Kristin Lauter, Principal Researcher at Microsoft Research and the former AWM President (2015-2017). Dr. Lauter shared stories of her work building community among women in math including initiatives like AWM ADVANCE and spoke about lessons learned on her career path.

The main focus of the chapter is on community outreach. Towards that end, they (1) run an undergraduate seminar with the goal of encouraging students to participate in research opportunities; (2) host visiting speakers; (3) organize a study session for undergraduates studying for exams; (4) are initiating a program to connect graduate student mentors with small groups of undergraduates to foster strong community.

Every year, the Mathematical Association of America holds the William Lowell Putnam Mathematical Competition for university students in mathematics. Students attempt to solve twelve notoriously difficult problems over the course of six hours on a Saturday in November. Thirteen students from the University of Colorado took the Putnam exam this year, with four students scoring in the top quartile of the 4623 participants. The highest scorer at the University of Colorado was Hongyi Chen, who placed 51.5th overall. The top three scorers will all receive cash prizes from the Department of Mathematics in recognition of their achievement.

Faculty Recognized With Teaching Awards

The pages of Prime Bits have long been filled with news of the Department's excellent teachers. We're pleased to report that this year, three of our professors have been honored for their teaching, at the campus level, the state level, and even the national level!

Professor Jeanne Clelland has an amazing reputation on campus for her wonderful teaching. Her Math Awareness Address to our undergraduates a few years ago on the proof of the Poincare Conjecture: "POINCARE' WAS RIGHT: If it looks like a sphere and quacks like a sphere, then it IS a sphere! (So why is this worth a Fields Medal?)," was an instant classic.

This year Clelland won two teaching awards. She won the 2018 Boulder Faculty Assembly Excellence in Teaching and Pedagogy Award, which "recognizes the importance of teaching and mentoring students as significant components of faculty duties."

Clelland also won the 2018 The Mathematical Association of America Rocky Mountain Section Burton W. Jones Distinguished Teaching Award. The MAA set up these regional awards in Distinguished College or University Teaching of Mathematics to recognize extraordinarily successful teachers of mathematics at the post-secondary level.

Clelland is a former Chair of our Undergraduate Program, and played a key role in improving our calculus offerings by championing the idea of having a permanent designated coordinator for our lower-level courses.

You can hear Clelland talk about her favorite theorem (spoiler alert: it's due to Gauss and Bonet) on the podcast https://kpknudson.com/my-favorite-theorem/ and read the accompanying blog at https://blogs.scientificamerican.com/roots-of-unity/jeanne-clellands-favorite-theorem/

As for her research, Clelland's talent was recognized early: she was awarded the Association for Women in Mathematics Alice T. Schafer Mathematics Prize For Excellence in Mathematics by an Undergraduate Woman in 1991 while studying at Duke University.

This year Professor Eric Stade won the 2018 American Mathematical Society Award for Impact on the Teaching and Learning of Mathematics "for his many sustainable and replicable contributions to mathematics and mathematics education at both the pre-college and college levels."

The AMS award cites that "he is an outstanding teacher who has received every teaching award that his home institution offers, including its highest teaching honor: a lifetime designation as President's Teaching Scholar." Indeed, he is a former winner of both the BFA and Burton Jones teaching awards. The AMS also notes that "he has worked with colleagues to transform, first, the precalculus and calculus pathways and, later, more than five courses in the undergraduate mathematics curriculum." In more detail, Stade (working with colleague Robert Tubbs) brought active learning to our main calculus sequence, and Stade built our successful MATH 1310: "Calculus for Life Sciences" course. The AMS also cites his role in founding CU's Center for STEM Learning (https://www.colorado.edu/csl) and as a founding member of the Mathematics Teacher Education Partnership, an initiative of the Association of Public and Land-Grant Universities (APLU) (http://mte-partnership.com), which follows his work of many years on our Mathematics for Elementary Educators (MATH 1110/1120) sequence.

He is currently working on a 10-year outreach project, CMTL: A Community of Math Teachers and Learners, funded by CU's Outreach Committee, which, as the AMS notes, "has sent more than 100 University of Colorado students, most of them prospective teachers, into local classrooms."

Here at Prime Bits we also want to mention that much of that transformational work was done while he was serving the Department as Undergraduate Chair and as Chair. He is currently the Executive Director of all the Residential Academic Programs in the College of Arts and Sciences.

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In 2018 Professor David Grant was named a President's Teaching Scholar (PTS) — the only CU Boulder professor honored last year with that lifetime designation. The stated mission of the PTS Program (https://www.cu.edu/ptsp) is to, "endorse excellence in teaching by honoring faculty throughout the university who excel and embody teaching, scholarship, creative work and research with excellence in all."
A former BFA teaching award winner, Grant has long worked to improve mathematics education for all students on campus. While chair, he worked with the faculty to develop "pathways" in our curriculum, so students of all majors can most efficiently get the mathematics training they need to advance to their chosen fields of study. He is also a founder and co-director of CU's Actuarial Studies Program (https://www.colorado.edu/program/asqf/).

He is currently working with colleagues Robert Tubbs and School of Education Professor David Webb on the CU portion of a 5-year, multi-school NSF project entitled SEMINAL: "Student Engagement in Mathematics through an Institutional Network for Active Learning," that's working on bringing the

active learning techniques pioneered here in calculus courses to other universities (http://www.aplu.org/projects-and-initiatives/stem-education/seminal/)

Alumni News

Our Alumni Website: AfterMath

We recently built a website for our Department's alumni and friends, aptly dubbed "AfterMath," which is a one-stop portal for everything having to do with our cherished alumni and friends. It contains links to alumni events (like our annual departmental Homecoming reception: see below), a repository of past Prime Bits, Donor Information, Departmental History (and old friends and colleagues remembered in memorium), and most importantly, a site where you can provide us with information about yourself for future issues of Prime Bits! (If you've tried before — we've made submitting information easier.)

Check out AfterMath at math.colorado.edu/alumni. You can also get to the site by pressing the "Alumni" button atop our department's home page, at https://www.colorado.edu/math/

Growing Alumni Tradition: Homecoming Reception

In 2019 we will host out third annual reception for our Alumni and Friends during CU's Fall Homecoming Weekend, to be held November 7-9. It's a chance to meet past and current students and faculty, learn what is currently going on in your old department, and pick-up a snazzy "AfterMath" polo shirt. The website for the event, http://math.colorado.edu/alumni/homecoming.php, will be updated as the date draws near.

Alumni and Friends News

Retired Professor Hank Hermes sends us happy news of several bike tours he took with his wife Carol. They did a tour in the "Volcano and Mountain District" of Chile, and another from San Francisco to Santa Barbara. As we go to press, they are soon off to Normandy to do a bike tour of the D-Day beaches.

Retired Professor Gordon Brown reports that he recently had a tour of the LIGO Hanford Observatory, where gravitational waves were recently first detected!

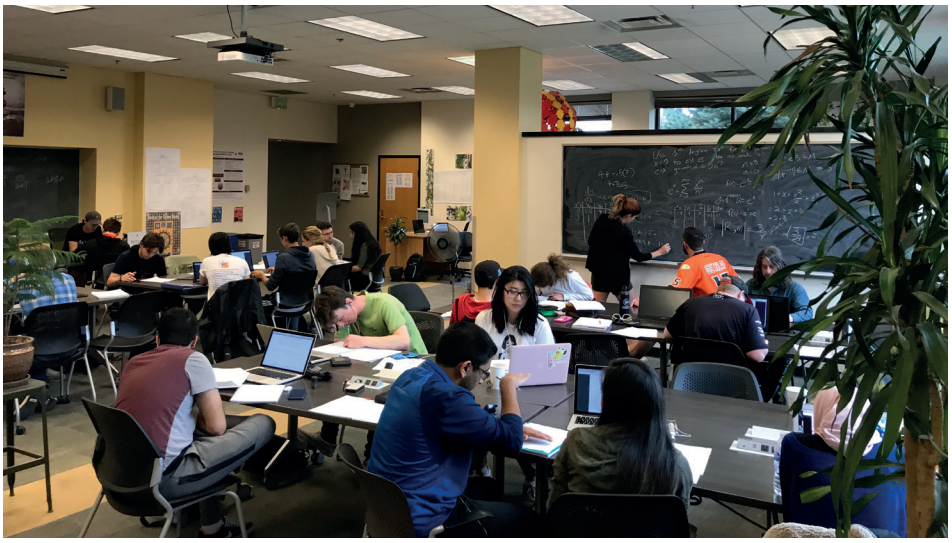
Students Getting Needed Help As MARC Hits Its Mark

Almost everyone (with the possible exception of PRIME BITS readers of course) needs help with math classes. A decade ago, as the Department started to convert its introductory classes to small, coordinated sections, the undergraduate chair at the time — Professor Robert Tubbs — had the idea of creating an undergraduate resource center where students could work with each other and get help from trained tutors.

In its current incarnation, under the leadership of Lecturer Danny Moritz, the MARC (Mathematics Undergraduate Resource Center) has grown and thrived, serving the mathematical needs of all students in all courses: in the last few months more than 1000 students have used the MARC, visiting collectively more that 4500 times.

The transformation started with the work of Math Department Office Manager Donna Maes, who, using funds provided by the College and the Department, worked with the College's architect to renovated MATH 175 (the old "Math Modules" testing center) into a room with blackboards and new furniture geared to getting students and tutors working in groups.

Then when Moritz took over as director in Spring 2016, he put his energies and skills into the transformation. The first effort was into branding. As tutor Peter Rock describes it: "when I started working at the math help lab … we were virtually unknown across the campus. Most of the time, when I told other students that I worked at the math help lab they would respond with, 'Wait! We have one of those? Where?'



Students and tutors collaborating in the MARC

Rock explained that Moritz not only adopted the new name of MARC, "he started a campaign to get word of the MARC out across campus with T-shirts, flyers, and stickers. We also got some much needed training for the new tutors and LAs about how to engage with students effectively and about what we wanted the image of the MARC to be." "Now, almost all of the students in my classes know about the MARC, several of them have told me that they wouldn't have gotten through some of their courses without it," he said.

Moritz describes how the MARC works: Students seeking help with their math course, or just a place to study, are greeted by the Warm Greeter and swipe their Buff One card. The card swiper is connected to MyCUHub, an internal data-sharing network that can be accessed by advisors and instructors to track MARC usage. Students take a seat at large, common-use tables in the center of the room or on couches under windows and began working on homework. When students encounter a sticky spot in their reasoning, they access one of the tutors stationed at tables in front of a blackboard on the periphery of the room. Ideally, students do not go straight to a tutor and have them work through a problem set. They use the tutors as a resource, as a "more capable

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other," in their "Zone of Proximal Development," Moritz said. The staff consists of graduate students who set an example of what "an efficient, joyous and thoughtful mathematician looks like" and Undergraduate Learning Assistants (LAs) who are "the stars and cheerleaders," he explained.

"the MARC has been a great place to connect with other math students and work through difficult math problems/ concepts together. All the tutors are very knowledgable and helpful. The MARC is a very welcoming community and is a great resource for math students." Another named Amanda said, "the MARC has been a game changer for me

Moritz explains the MARC Logo: "Euclid's First Postulate displays two circles of equal diameter merging to create an equilateral triangle. Elegant to the eye, mysterious with simplicity. The image can be interpreted as two people meeting to manifest something that transcends their individuality."

Moritz says the MARC credo is "Learning is Dignity," and this provides an ethos of comaradery and humanity. He points out that most students seeking help in the MARC start with two strikes against them. One is that mathematics can be a roadblock to their future studies. "I'm not a math person and I need to get through Calc II for my Biology major," is a sentiment shared by many undergraduates. Another is the stigma that sometimes accompanies difficulties with mathematics, and the MARC tries to dismantle this stigma by offering a warm and comfortable place where skilled and enthusiastic tutors inspire math conversations, he said, explaining that "MARC transforms commiseration into collaboration. MARC tutors are trained to activate what the student knows to help them assimilate what they do not know. This strategy engages the problem solver, making the problem their own problem, rather than an external entity with an algorithmic solution."

According to students, this approach is working. Junior Jane VanAusdall said, in mathematics. I was never very good at math in high school, so coming in as an Astronomy major I knew I would need some help. When I first found the MARC I would spend hours there every day for many reasons! The tutors there are always very helpful, relatable, and great listeners; they always access the knowledge I already have to answer my questions, they are resourceful, drawing on chalkboards or folding sheets of paper into shapes to visualize, even utilizing the posters around the room with useful equations for all math levels! I have always been encouraged to answer as much as I can as opposed to just being given the answers, and the tutors really try to understand what you know to nudge you in the right direction. The greeters are always friendly, the space is large so there's plenty of room to spread out your papers — charging stations, snacks, FREE tutoring?! The MARC is a haven!"

Moritz comes to his philosophy after a career in developmental mathematics. After graduating CU Boulder as a math major in 2003, Moritz taught kindergarten and was an interpreter for graduate students interviewing subsistence farmers and coffee growers in Honduras for a year. He then attempted Zen Buddhism off and on for 4 years. After teaching middle school for 4 years in Aurora, he earned his MSED at CU-Denver in 2013. He taught business calculus and finite math at Metro State in Denver for a couple of years. Then he returned to our department to teach quantitative reasoning, and took over as LA departmental coordinator in the fall of 2015, before also taking over directing the MARC in 2016.

Moritz emphasizes that the MARC is a service to the community, but it's also an organic community that the students who work there have created for themselves. For example, it hosts pingpong late every Friday afternoon for students and workers to interact in a relaxed setting.

Tragedy befell the community this past year, when Joey Evans, an undergraduate Applied Math major who worked in the MARC died suddenly. The MARC held a ceremony for the grieving community and family, and built a memorial in Joey's memory.

To learn more, check out the MARC at https://math.colorado.edu/marc/.

New Experimental Mathematics Lab

We all love seeing mathematics in action. At the Math Department's new Experimental Mathematics Lab, undergraduates actually get to SEE mathematics.

The brain-child of CU Math Professor Katharine Stange - who directs the lab - its purpose is to build a community of undergraduates, graduate students, and faculty at CU engaging in mathematical and pedagogical research projects. Stange says that at the lab, research is viewed more widely than just theorem-proving, and there is an emphasis on computer experimentation, visualization, data exploration and conjecture-making. This opens up mathematical research participation to a wide group of undergraduates who go on to all manner of future careers, and can be ambassadors of mathematics to the public. There is an emphasis on using the lab's projects to reach out to the greater community— see for example the picture in the last Prime Bits of a 3D-printing installation the lab produced for the Gemmill Engineering, Mathematics, and Physics Library in the math building (see page 3 of https://math.colorado.edu/documents/primebits/PrimeBits2018.pdf)

As we reported last year, Stange recently received a prestigious five-year National Science Foundation CAREER Award. These awards are intended to recognize junior faculty who exemplify the role of teacher-scholars through research, education, and the integration of education and research within the context of the mission of their organizations. Her CAREER grant is supporting the lab.

This semester, the lab is running three projects. The first is called Visualizing Integer Sequences, run by Stange and graduate student Sebastian Bozlee. Right now, students are creating a website called Numberscope, which will act as a visualization tool for integer sequences. It will interface with the On-Line Encyclopedia of Integer Sequences (OEIS) and has a modular design which will allow the public to write visualization tools in p5.js, a common web-based coding platform for visual illustration. Students are creating visualization tools that implement turtle walks, number spirals, shift-matching patterns, and even Conway's Game of Life. A user of Visualizing Integer Sequences will be able to choose an integer sequence from the OEIS or elsewhere, choose a visualizer, and then explore!

Another project, under the direction of Dr. Ilya Mishev and graduate student Sarah Arpin, is currently investigating the mathematics of the binomial transform. A third project, jointly advised by Stange and Professor Paul Beale of the Physics Department, is investigating the randomness of number theoretical sequences.

Stange says the lab was inspired by the growing network of Geometry Labs at universities throughout the country, which are united under the umbrella organization, Geometry Labs United. CU Undergraduates in the lab are supported in part by the Undergraduate Research Opportunities Program on campus. For the future, the lab has plans to purchase a Glowforge laser cutter.

For more information on the lab and its ongoing activities, see https://www.colorado.edu/math/content/experimental-mathematics-lab

Commencement Keynote Speaker

In 2018, the Department had its second annual Keynote Speaker at our Spring Graduation Ceremony — Dr. Collin Starkweather of Charles River Associates. Dr. Collin Starkweather received his undergraduate degree in Mathematics from CU Boulder in 1996. He is an economist specializing in financial markets and antitrust economics who works with economics and business faculty at the University of Chicago and other academic institutions, as well as Wall Street professionals on economics consulting engagements. He has also led technology teams and served as a software engineer and architect at three successful high-tech startup companies. His work as an economist and technologist has placed him on the front lines of two of the most prominent events of the past generation: the dawn of the Internet and the Great Recession.

Awards Won By Students In The Department

Undergraduate Students (funded by gifts from our readers)

Jenna Allen and **Megan Collins** are the recipients of the 2018-2019 Jack Hodges Award for Excellence in Mathematics, given annually to advanced undergraduate students majoring in Mathematics who have demonstrated the greatest promise in the mathematical sciences.

Henry Fontana is the recipient of the 2018-2019 Marlene Massaro and David Pratto Scholarships in Mathematics. This scholarship is awarded annually to an exceptional upper-level undergraduate Mathematics major.

Congratulations to **Michael Evans** and **Sara Vannett**, recipients of the 2018-2019 Mr. and Mrs. J. Tour Scholarship, which was established to benefit full-time "needy senior class or graduate students in the advancement of the study of physical sciences and engineering."

Darius Alizadeh, Connor Meredith, Ryan Mike, Bentley Scholz, Erin Smith, and **Justin Willson** received 2018-2019 Sieglinde Talbott Haller Scholarships, given annually to graduate and undergraduate students in Mathematics who show exceptional mathematical promise.

Mohammad Ozaslan won the 2018-2019 Jim and Laura Marshall Scholarship.

Graduate Students (funded by gifts from our readers)

Jonathan Quartin and **Patrick Wynne** are the winners of the 2018 W. E. Briggs Teaching Excellence Awards, given annually to first-year graduate teaching assistants or graduate part-time instructors in the Department in recognition of outstanding accomplishments in teaching.

Katharine Adamyk, Brendt Gerics, and **Cherry Ng** are the winners of the 2018 Burton W. Jones Teaching Excellence Award, given annually to a veteran graduate teaching assistant or graduate part-time instructor in the Department in recognition of outstanding accomplishments in teaching.

The Briggs and Jones Teaching Excellence Awards are supported by the B. W. Jones and W. E. Briggs Teaching Excellence Award funds.

Jonathan Belcher, Kevin Berg, Shawn Burkett, Carlos Pinilla, Mark Pullins, Athena Sparks, Steven Weinell, Ali Lotfi, and **Michael Wheeler** are recipients of the 2018 Adele V. Leonhardy Memorial Scholarships. These scholarships are awarded annually to outstanding students who plan careers in teaching mathematics.

Braden Balentine, Taylor Klotz, Shen Lu, Cherry Ng won Frances C. Stribic/University Summer Fellowships.

Krisztina Dearborn and **Matthew Pierson** are the winners of the 2018 W. J. Thron Summer Fellowships, awarded annually to the most outstanding third or fourth year graduate students.

Sebastian Bozlee, Leo Herr, Ruofan Li, Daniel Martin, Sarah Salmon, Noah Williams, John Willis, and **Zhenhua Wang** won Sieglinde Talbott Haller Scholarships, which get awarded annually to select students in the Math Department.

Katharine Adamyk, Nathan Davidoff, Andrew Healy, Jun Hong, Trevor Jack, Saeed Khalili, Paul Lessard, Nicole Sanderson, and **Tyler Schrock** were recipients of University Fellowships.

Degrees Awarded

In 2018, the Department awarded eight doctorate degrees. The recipients are:

Clifford Blakestad, PhD
Advisor: David Grant
Thesis title: Weierstrass p-adic sigma and zeta functions on curves and abelian varieties

Natalie A. Coston, PhD
Advisor: Sean O'Rourke
Thesis title: Spectral Properties of Products of Independent Random Matrices

Josh Frinak, PhD
Advisor: Sebastian Casalaina-Martin
Thesis title: Degeneration of Prym Varieties: A Computational Approach to the Indeterminacy Locus of the Prym Map and Degenerations of Cubic Threefolds

Jonathan P. Lamar, PhD
Advisor: Nathaniel Thiem
Thesis Title: Lattices of Supercharacter Theories

Sion Ledbetter, PhD
Graduate Advisor: Martin Walters
Dissertation Title: Heisenberg codes and channels

Ian M. Long, PhD
Graduate Advisor: Judith Packer
Dissertation Title: Spectral Hutchinson-3 Measures and Their Associated Operator Fractals

Megan Danielle Ly, PhD
Graduate Advisor: Nathaniel Thiem
Dissertation Title: Schur-Weyl duality for unipotent upper triangular matrices

Jeffrey Alan Shriner, PhD
Advisor: Agnes Szendrei
Thesis title: Hardness Results for the Subpower Membership Problem

The Department also awarded 17 Masters Degrees (departmental advisors listed in parentheses) to:

Katharine Lauren Marie Adamyk, MS (Agnès Beaudry)
Sarah Arpin, MS (Katherine Stange)
Braden Balentine, MA (Magdalena Czubak)
Isabel Corona, MS (Martin Walter)
Krisztina Erzsebet Dearborn, MS (Sergei Kuznetsov)
Brendt Gerics, MA (Jeanne Clelland)
Jun S. Hong, MA (Peter Elliott)
Saeed Khalili, MA (Sergei Kuznetsov)
Ali Lotfi, MA (Keith Kearnes)
Shen Lu, MA (Judith Packer)
Cherry Ng, MA (Agnès Beaudry)
Matthew Carter Pierson, MA (Alexander Gorokhovsky)
Tyler Schrock, MA (Nathaniel Thiem and Josh Grochow)
Athena Crystine Sparks, MA (Peter Mayr)
Michael James Wheeler, MA (Agnes Szendrei)

Two awarded concurrently with a BA degree:
Kellin Pelrine, BA/MS (Sergei Kuznetsov)
Shumin Zeng, BA/MA (Sean O'Rourke)

Three undergraduates graduated with honors in Mathematics:

Justin Richman (summa cum laude), **Peter Robert Rock II** (summa cum laude), and **Megan Elizabeth Sochinski** (magna cum laude)

Sixteen graduating seniors were awarded memberships in the Pi Mu Epsilon (PME) Math Honor's Society:

Matthew Garrett Beck, Ian Forrester Gossett, Anna Katherine Harkabus, Sharon Esther Huh , Julian Ilan Kley, Brandon Alexander Knutson, Paul-Robert Laliberte, Rebecca Joy Landau, Nicholas James Morris, Yalda Nia, Kellin Pelrine, Justin Richman, Peter Robert Rock II, Christine Elizabeth Salva, Megan Elizabeth Sochinski, and **James Henry Wiley**

Faculty Achievements

Professor **Sean O'Rourke** was awarded a grant from the National Science Foundation to fund his research in Probability. His project is entitled: "Eigenvectors of Large-Dimensional Random Matrices and Graphs."

Professor **Sebastian Casalaina-Martin** received a Simons Foundation Collaboration Grant for Mathematicians.

Professor **Magdalene Czubak** received a Simons Collaboration Grant for Mathematicians, and was an invited speakers at a conference at KTH Royal Institute of Technology in Stockholm.

This year — for the second year in a row — Instructor **Divya Vernerey** received the Marinus Smith Award from New Student and Family Programs at the University of Colorado Boulder. The purpose of this award is to identify and recognize CU Boulder faculty, staff, coaches, and administrators who have made a significant impact on the lives of CU Boulder students.

Instructors **Joseph Timmer** and **Lee Roberson** were named ASSETT (Arts & Sciences Support of Education Through Education Technology) Faculty Fellows.

See their smiling faces at https://www.colorado.edu/assett. The ASSETT Faculty Fellows Program is a collaborative community of faculty from the College of Arts & Sciences who address teaching, learning, and technology challenges within their individual departments.

In this issue of PRIME BITS there is an article on the various teaching awards won by Professors **Jeanne Clelland, David Grant**, and **Eric Stade**.

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