CU Prime Bits

Department of Mathematics

2017 - 2018

Chair's Communiqué

A lot has happened in our Department in the past year. Yet again, we are happy and privileged to teach by far the most undergraduate students in the University. Undergraduate teaching has always been an important priority for our Department, and we are continuously looking into ways to offer a better experience and wider choices both to our majors and minors and to students who need to learn mathematics to pursue other careers. We have now completed the transition of our undergraduate program to courses taught only in small classes. The research and experience in many mathematics departments, including ours, offer strong support to the idea that this way of teaching is beneficial to our students.

Growth in our Undergraduate program necessitated the creation of a new position in our Department, Director of Lower Division Curriculum. We are very happy that Dr. Faan Tone Liu agreed to take this position. She has been an Instructor in our Department since 2012. In her years in the Department she not only proved herself to be a star teacher, but also spearheaded several important initiatives to improve several of our calculus courses, bringing to them active learning techniques and improving the professional development of the graduate students teaching these classes. In her new position, Dr. Liu will continue to work on maintaining the uniformly high quality of all of our lower division offerings

We also expanded our offerings in undergraduate upper division classes. A new class on linear algebra for math majors is running this year. We will also offer a class on the Mathematical Theory of Interest, intended to help the students in the Actuarial Program. This class first ran last year with great success.

This year we embarked on a new educational innovation – converting our multivariable calculus classes to active-learning classrooms. Our active-learning single variable calculus classes have been a great success for many years – a few years ago the Mathematics Teacher Education Partnership of the Association of Public and Land Grant Universities named our first-year calculus sequence one of four national models of how calculus should be taught. The great amount of work required for the transformation of our multivariable calculus course was done by Liu and instructor Lee Roberson, who got his PhD in mathematics education from the University of Northern Colorado, with a thesis focused on active leaving.

We also continue our Summer Research Experience program for Undergraduates. This innovative program, which we started a few years ago, has become very popular with our students. Recently this program has been expanded to include the first-year graduate students. Indeed, all our first-year students get the chance to be funded their first summer of graduate studies to participate and play a mentoring role in the summer research program for our undergraduates. With this, the summer research teams consist of graduate and undergraduate students working together under the direction of faculty members.

Our graduate program welcomed eight new students this Fall. As you read above, the students in our graduate program are very active in the teaching and research missions of our department.

We are very pleased to announce that one our assistant Professors, Katherine (Kate) Stange, received a great honor this past year, being awarded the prestigious NSF CAREER award, one of only 42 awarded this year nationwide in all the mathematical sciences. Kate used her award to set up a Experimental Mathematics Lab, which will support undergraduate participation in mathematical research projects, including experimentation with technology and the development of software tools and mathematical visualizations, as well as outreach. You can check it out as it progresses, at **https://www.colorado.edu/math/content/experimental-mathematics-lab**

Finally, I would be remiss if I didn't thank our alumni and friends for their tremendous outpouring of support this year. It is indeed your generosity which allows us to continue to innovate and provide opportunities for our students.

New Math Department Chair **Sasha Gorokhovsky**

In 2017 Professor Alexander (Sasha) Gorokhovsky was selected by his colleagues to be Chair of the Department of Mathematics, serving the traditional three-year term. Sasha has been a professor at CU since 2002, and was previously Chair of the Department's Graduate Program.

Sasha is an expert in the field of Non-commutative Geometry, where ideas of Differential Geometry and Analysis are combined to study each other. He is best known for his work on the deformation theory of gerbs and equivariant index theory.

He is a famously excellent teacher, and confesses his love for teaching both undergraduate and graduate students at CU. His favorite courses to teach are Introduction to Discrete Mathematics (where our math majors now cut their teeth on learning to prove theorems) and Differential Equations.

Sasha was born in Kiev, and lived through the Chernobyl disaster (his grandfather, a mining engineer, played a key role in figuring out how to encase the crippled reactor). His mathematical prowess showed itself early, and he represented Ukraine in the all-USSR high school mathematical olympiad (where he earned 2nd prize twice and 3rd prize once), and went on to be part of the olympiad team representing the USSR.

He studied first at Moscow State University, and then at the Technion when his family moved to Israel. He got his PhD under Henri Moscovici at the Ohio State University, and then was a postdoctoral fellow at the University of Michigan. Since coming to CU, Sasha has visited math institutes around the world, including the IHES in Orsay and the Max Planck Institute in Bonn. He has been a visitor at the Universities of Copenhagen, Paris, and Metz.

He married his wife Julia in 1998 and they have a 16-year old son Elia, who is a student at Boulder's Fairview High School.

In his spare time he likes to read — especially historical novels — in English, Russian, and Ukrainian.

New Assistant Professor Robin Deeley

The Department is very pleased to have been able to recruit a new Assistant Professor, Robin Deeley, who specializes in index theory and dynamical systems, which fits well into our existing research strengths.

Robin grew up in the Toronto suburb of Georgetown, and although he always excelled at mathematics — he reports that it took him a while to realize one could actually make a living doing it!

He did his undergraduate work at the University of Waterloo, starting by studying applied mathematics, and then branching out into theo-retical math. He did his PhD at the University of Victoria, where he took advantage of the weather to get some hiking in.

During his postdoctoral position at the University of Hawaii, he also got into long-distance running, and ran a half-marathon there. Of course, he said he was winded the first time he ran at altitude in Boulder, but says he now finds it a great place to run.

For fun he also likes to travel, especially exploring new cities and their art scenes. He enjoyed Honolulu's art galleries, which display the work of the many artists who live there.

He looks forward to checking out Colorado art and music venues. He especially enjoys indie-rock bands, like Interpol.

Department Research News

This year the Department hired two new two-year Burnett Meyer Post-docs, Drs. Farid Aliniaeifard and William DeMeo. They join Drs. Philip Kopel, Tien Trinh and Leonard Huang, who are in the second year of their tenure as Meyer postdocs. Farid got his Phd in 2017 from York University in algebraic combinatorics and is being mentored by Professor Nat Thiem. DeMeo earned his PhD in 2012 at the University of Hawaii, working in Universal Algebra, and has previously been at Iowa State and the University of South Carolina. He is being mentored by Professor Peter Mayr.

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 three Ulam Visiting Professors this year: algebraic geometer William Gilliam of Boğaziçi University (who is visiting Professor Jonathan Wise), and number theorist Pedro Berrizbeitia of Universidad Simón Bolívar (who is visiting Professor Peter Elliott).

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's Fifty-Third Annual DeLong Lecture Series was delivered this year by Professor Michael J. Hopkins of Harvard University, who gave talks on "Homotopy theory and its many roles in mathematics," and "Topological quantum field theories." Hopkins is one of the most important figures in the development of modern algebraic topology, and his work has influenced mathematics across fields.

The Lecture Series is funded by an endowment given by Professor Ira M. DeLong, who came to CU in 1888 at the age of 33, and played a vital role in the life of the University and the City of Boulder until his death in 1942. This year's lectures were organized by Professors Janos Englander and Sebastian Casalaina-Martin, with the help of Professors Markus Pflaum and Agnès Beaudry.

The Department hosted two conferences this past year, a two-day ``Groupoidfest 2017," in March, organized by faculty Arlan Ramsay, Alex Kumjian, and Leonard Huang, and "Topology Day" in March, organized by faculty Agnès Beaudry, Markus Pflaum, and Jordan Watts.

The Department has two new courtesy appointments this past year, Professor Joshua Grochow from the Department of Computer Science, who works on the intersection of complexity and algebra, and Professor David Webb of the School of Educa-

tion, who is an expert on mathematics education. They join Professors John Black of Computer Science and Mahesh Varanasi of Electrical and Energy Engineering as holders of courtesy appointments, which recognize strong collaborations between mathematicians in our Department and kindred spirits across campus.

▶ VISUALIZING **MATH**

Shapes that visualize the Gaussian primes — which are currently on display in the Gemmill Engineering, Math & Physics Library— were created on a 3D printer by students Sharon Huh, Paul-Robert Laliberte, Chloe Pradeau, and Jack Werner, under the direction of Professors Eric Stade and Kate Stange. For more on the project, see: www.colorado.edu/math/visualizing-number-theory-spring-2017

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.

able to fund 21 undergraduates and seven first-year graduate students. We had seven different projects mentored by faculty Agnès Beaudry, Magda Czubak, Markus Pflaum, Kate Stange, Nat Thiem, Divya Vernerey, and Jonathan Wise, covering a broad swath of mathematical disciplines.

The three top three scorers from CU Boulder on the 2017 William Lowell Putnam Mathematical Competition were Ibraheem Khan (first in Colorado), Nicholas Boschert (second in Colorado), and Bradley Jonathan Sain. Each received a prize from the mathematics department. The Putnam exam is taken by college students throughout the US and Canada.

-Approximately π students enjoying pie on Pi Day

The Math Club runs our Department's annual Pi Day (3/14) celebration, this year marking this transcendental day by distributing pies, T-shirts, and tote bags (designed by math major Ji Hoon Kim) to our students.

In the Spring of 2017, Dr. Vernerey also helped revive CU Boulder's Pi Mu Epsilon's (PME) Chapter. PME is an honor's math society which recognizes undergraduate achievements.

Our summer Research Program for Undergraduates continues to thrive under the able guidance of Professor Nat Thiem, attracting more interest than ever. Summer 2017 had over 60 undergraduate applicants (the previous year had around 30), and we were

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 second year. Our Department's AWM leader, graduate student Krisztina Dearborn, reports that 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.

The Department made two important changes this year to its undergraduate curriculum. Through the efforts of Drs. Faan Tone Liu and Lee Robertson, our multivariable calculus course (MATH 2400) was converted from a lecture course to an active learning course, where students work on projects in groups during class to get hands-on experience with the material. The Department has for years taught first-year calculus courses (MATH 1300, MATH 1310, and MATH 2300) using active learning, putting CU in the vanguard in mathematics pedagogical reform. Indeed our first-year calculus sequence was named as a national model for how calculus should be taught a few years ago by the Mathematics Teacher Education Partnership of the Association of Public and Land-grant Universities.

Our department also inaugurated a new course this past fall: Linear Algebra for Math Majors (MATH 2135) which is a proof-based introduction to the field for math majors, who have already been introduced to theorem-proving in our MATH 2001: Introduction to Discrete Mathematics course.

Wonderful Year Of Giving

The year 2017 was a particularly fortunate one for the Mathematics Department and its students, with an outpouring of generosity from alumni and friends. This has led to the creation of three new undergraduate fellowships, and the significant expansion of several existing fellowships. All of these allow our students to continue their education and concentrate on their studies.

∫∫∫ Former CU math major and current Princeton Mathematics Professor Robert Clifford (Bob) Gunning and his wife Wanda Gunning have endowed an undergraduate fellowship in their name, to be awarded annually to a Colorado resident (or residents) who can demonstrate "their fervor for mathematics."Gunning is perhaps the most prominent mathematician to have ever graduated from CU, famous for his research in Riemann surfaces and several complex variables. He is also renown for his mathematical texts, which have inspired generations of researchers. Famous at Princeton for his excellent teaching and attention to undergraduates, he has also served that institution as Chair of the Mathematics Department and Dean of the Faculty. He was awarded an honorary degree by CU in 2006. A native of Longmont, and a graduate of the CU class of 1952, Bob has fond memories of his time as an undergraduate at Boulder, recalling: "I had a good time in Boulder, learned a good deal in the courses and met an interesting and varied group of students, both graduate and undergraduate, and faculty members, all of whom were helpful and quite willing to talk to an inexperienced under-graduate."

∫∫∫ CU Math alumni Den Ducoff and Claire McCorrison gave a significant gift to endow a fellowship to go annually to a mathematics student who is also employed as a mathematics tutor. They created this endowment to benefit the next generation of math scholars, teachers, and mentors.
After 25-year careers working for high tech firms, Den and Claire changed course in recent years, with Claire earning her Masters in Social Work in 2008 and Den becoming a math tutor in 2011. Explaining their generosity, Claire said, "in looking back on our lives, we got our start through the wonderful professors at CU. We believe in math — now more than ever." Den added, "this isn't so much a gift as it is a reciprocity, balancing the gifts we received in our education. It's just giving back."

∫∫∫ Longtime CU benefactor and lifelong Coloradan Jack Hyatt passed away on March 11, 2017, at the age of 75. The Denver attorney and former CU math major left the College a substantial gift to establish an annual undergraduate scholarship "for students majoring in mathematics who are of modest means and who plan on becoming a secondary teacher or attorney" in Colorado. (He also left a sizable gift to the Law School.) His nephew, CU Law School alumnus Aaron Hyatt, lost his father at an early age, and his uncle Jack was like a father to him. He described his uncle as "an extremely special person, and everyone who came into contact with him experienced it. He left a lot of gifts to a lot of people." Jack grew up with modest means, and with the scholarship, Aaron said, "he wanted to give others who didn't have much the shot he had." The Intermountain Jewish News succinctly summed up the type of man Hyatt was in a tribute to Jack, calling him "a mensch." He served as a board member of Mental Health Colorado and was long active in JEWISHcolorado. For more information, see: **https://www.colorado.edu/asmagazine/2017/08/07/late-jack-hyatt-continues-his-cu-legacy-math-endowment**

∫∫∫ A few years ago the family and friends of our late colleague Rich Laver endowed an annual graduate Fellowship in his honor, and have continued to support the fund. This year, Rich's (and our) former colleague Don Monk and his wife Dorothy Monk gave an extraordinary gift to this endowment, single-handedly assuring that we now have the ability to award two Laver fellowships annually. Don received his Ph.D. from U.C. Berkeley in 1961 under the direction of Alfred Tarski. He was hired at CU in 1962, and spent his entire career here except for a number of research leaves, typically to Berkeley or ETH Zurich. Don retired in 2015. During his career, Don published 11 books and 72 papers. He supervised 20 Ph.D. theses, and has at least 115 mathematical descendants. He is considered to be one of the foremost experts in algebraic logic and in the theory of Boolean algebras. Outside of work, Don is an avid climber and mountaineer, who is known for five first ascents, including McArthur Peak and the east ridge of Mount Logan in the Yukon Territory, the Great Couloir and Easy Ridge in the Brazos Cliffs in northern New Mexico, and the south ridge of Molar Tooth on the east ridge of Grand Teton. "Monk's Needle" in the Back Rocks above Los Alamos was named for Don.

∫∫∫ The Jack Hodges Award for Excellence in Mathematics is given annually to the advanced undergraduate student majoring in mathematics who has demonstrated the greatest promise in the mathematical sciences. In the past couple of years, we're pleased to say that Jean Hodges has given additional funds to this endowment that allows us to double the annual amount of the award.

∫∫∫ The Department annually awards a Marlene Massaro and David Pratto Scholarship in Mathematics to an exceptional math major. We gratefully acknowledge that this past year, Marlene Pratto has donated endowment funds sufficient to double the amount of this prestigious award.

Department Outreach

The Department's Outreach Committee gives back to the community and helps young people develop. This year faculty Eric Stade, Beth Stade, and graduate student Lauren Farquhar analyzed data from the Boulder Valley School District on student class placement, grades, achievement, ethnicity, gender, and income to identify systemic inequities in mathematics achievement and placement. Based on the analysis, the Committee purchased books and supplies to support equitable classroom practices, and continues its conversation on equity with the District.

CU Math major Katherine Zagnoli participated on a panel at STEM Launch K-8 School in Thorton, Colorado, overseeing 7th graders share their mathematical ideas for improving the National Parks.

The Outreach Committee is also a proud sponsor of Colorado Math Circle, which brings together Colorado's top middle and high school students for math talks and collaborative problem solving.

Awards Won By Students In The Department

Undergraduate Students (funded by gifts from our readers)

Peter Rock is the recipient of the 2016-2017 Jack Hodges Award for Excellence in Mathematics, given annually to the advanced undergraduate student majoring in Mathematics who has demonstrated the greatest promise in the mathematical sciences.

Atakan Hilmi Firat is the winner of the 2016-2017 George and Clara Moreno Scholarship. This scholarship is awarded annually to outstanding students in Mathematics.

Sharon Huh and **Brandon Knutson** are the recipients of the 2016-2017 Marlene Massaro and David Pratto Scholarships in Mathematics. This scholarship is awarded annually to exceptional upper-level undergraduate Mathematics majors.

Hannah Rieder is the winner of the 2017-2018 Adele V. Leonhardy Memorial Scholarship. This scholarship is awarded annually to outstanding students who plan careers in teaching mathematics.

Richard Dyer won the 2016-2017 Jim and Laura Marshall Scholarship.

Graduate Students (funded by gifts from our readers)

Jordan DuBeau is the winner of the 2017 W. E. Briggs Teaching Excellence Award, given annually to a first-year graduate teaching assistant or graduate part-time instructor in the Department in recognition of outstanding accomplishments in teaching.

Mark Pullins, Jeffrey Shriner, and **Noah Williams** are the winners of the 2017 Burton W. Jones Teaching Excellence Award, "given annually to veteran graduate teaching assistants or graduate part-time instructors".

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

Andrew Healy, Taylor Klotz, Caroline Matson, and **Katharine Adamyk** are recipients of the 2016-2017 Adele V. Leonhardy Memorial Scholarships. These scholarships are awarded annually to outstanding students who plan careers in teaching mathematics.

John Willis, Sebastian Bozlee, Noah Williams, and **Daniel Martin** won Frances C. Stribic/University Summer Fellowships.

Mark Pullins is the winner of the W. J. Thron Summer Fellowship, awarded annually to the most outstanding third or fourth year graduate student.

Jonathan Lamar, Jeffrey Shriner, Robert Hines, Leo Herr, Sarah Salmon, Hanson Smith, Ruofan Li, and **Zhenhua Wang** won Sieglinde Talbott Haller Scholarships, which get awarded annually to select students in the Math Department.

Joshua Frinak won the Francis E. Miller Scholarship.

Clifford Blakestad, Mason Pelfrey, Jonathan Belcher, Shawn Burkett, Nathan Davidoff, Sion Ledbetter, Paul Lessard, Saeed Khalili, Carlos Pinilla, and **Ali Lotfi** were recipients of University Fellowships.

Degrees Awarded

Boramey Mony Chhay, PhD
Graduate Advisor: Dr. Stephen Preston
Dissertation Title: Euler-Arnold Equations on the Contactomorphism Group and Teichmuller Theory

Andrew Paul Moorhead, PhD
Graduate Advisor: Dr. Keith Kearnes
Dissertation Title: Higher Commutator Theory for Congruence Modular Varieties

Keli Siqueiros Parker, PhD
Graduate Advisor: Dr. Jonathan Wise
Dissertation Title: Semistable Modular Compactifications of Moduli Spaces of Genus One Curves

Ryan Rosenbaum, PhD
Graduate Advisor: Dr. Eric Stade
Dissertation Title: On the Poles of Mellin Transforms of Spherical Principal Series Whittaker Functions

Kathleen Elise Smith, PhD
Graduate Advisor: Dr. Sergei Kuznetsov
Dissertation Title: On Minimum Variance Unbiased Estimation of an Unknown Matrix or Scalar Raised to a Power

Pearce Clifford Washabaugh, PhD
Graduate Advisor: Dr. Magdalena Czubak
Dissertation Title: The Diffeomorphism Group Approach to Vorticity Model Equations

▶ Commencement Keynote Speaker

In 2017, the Department had its first annual Keynote Speaker at our Spring Graduation Ceremony. The inaugural Keynote Speaker was actuary Chris Mast of Mercer Advisors.

Chris received his CU degree in Mathematics in 2005, with a minor in Economics and a certificate in Actuarial Studies. Chris has spent his entire career as an actuary at Mercer, a human resources consulting company, helping employers design and budget for their employee benefit plans. He now leads Mercer's Actuarial and Financial Group for the West Market. He is a Fellow of the Society of Actuaries, a Member of the American Academy of Actuaries, and a Fellow of the Conference of Consulting Actuaries.

The Department also awarded 8 Masters Degrees (advisors listed in parentheses) to:

Rachel Nicole Benefiel, MA
(Professor Jeanne Clelland)

Sebastian Bozlee, MA
(Professor Jonathan Wise)

Boramey Mony Chhay, MA
(Professor Stephen Preston)

Joshua Frinak, MA
(Professor Sebastian Casalaina-Martin)

Taylor Joseph Klotz, MA
(Professor Jeanne Cleland)

Hanson Smith, MA
(Professor Katherine Stange)

Kathleen Elise Smith, MA
(Professor Sergei Kuznetsov)

Noah Nelson Williams, MA
(Professor Sean O'Rourke)

Two undergraduates graduated with honors in Mathematics: **Aaron Allen** (magna cum laude) and **Nicholas James Worthington Boschert** (magna cum laude).

Ten graduating seniors were awarded memberships in the Pi Mu Epsilon (PME) Math Honor's Society: **Nicholas Broe Bloom, Jiahao Cao, Lucas Christopher Goad, Tengfei Gong, Like Hu, Benjamin Rainier Mobley, Rachel Leigh Schauer, Chayenne Marie Theberge, James Peter Waugh, and Dengli Yang.**

Faculty Achievements

Professor **Kate Stange** has received a 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. The award will support her research activities in number theory, arithmetic geometry, Kleinian groups, and cryptography. It will also support accessible research and outreach experiences for CU Boulder undergraduate students.

Kearnes is in the center with the Hawaiian shirt, Vernerey is in the right foreground with the multicolored skirt

Instructor **Divya Vernerey,** Professor **Keith Kearnes**, and graduate teaching assistant **Natalie Coston** were selected in 2017 to receive 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.

This past year, Professors **Carla Farsi** and **Jeanne Clelland** were both awarded 5-year Collaboration Grant for Mathematicians from the Simons Foundation. This past year the American Mathematical Society published Clelland's graduate textbook: "From Frenet to Cartan: The Method of Moving Frames."

Professor **Keith Kearnes** won a "2017 Colorado Mathematics Award For Outstanding Service to Students," from the Colorado Governor.

Kearnes was also awarded an NSF grant to support logic conferences in the Rocky Mountain area during the years 2017-19. The co-PIs on the grant are Professors Peter Mayr and Agnes Szendrei, and two professors at Denver University.

Professor **Judith Packer** gave invited talks this past year at the Centre de Recerca Matemàtica outside Barcelona, and the International Centre for Mathematical Sciences in Edinburgh.

Professor **Sebastian Casalaina-Martin** was on sabbatical in the fall, visiting a number of different institutions, with lengthier stays at Stony Brook University, and Leibniz University in Hannover.

Alumni News

New Alumni Website: AfterMath

We are please to announce a new 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 new annual departmental Homecoming reception: see below), a repository of past Prime Bits, Information for Donors, 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! Check out AfterMath at math.colorado.edu/alumni

New Alumni Tradition: Homecoming Reception

In 2017 we inaugurated a new annual tradition — a reception for our Alumni and Friends during CU's Fall Homecoming Weekend, to be held the weekend of October 25-28 in 2018. 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

We are sad to report that longtime math department staffer Wanda Knopinski passed away in October at the age of 92. Wanda spent 34 years working as an administrative assistant for the Department. For more on her life, see: **http://www.legacy.com/obituaries/dailycamera/obituary.aspx?pid=187481589**

Math and International Studies major Anneke Claypool from the class of 2011 won a prestigious NSF graduate fellowship. She turned it down in favor of a Interdisciplinary Graduate Fellowship from Stanford, where she is a PhD student in Management Science and Engineering.

Retired Professor Gordon Brown reports that, last year he gave himself "a taste of my preretirement life" by attending AMS Sectional Meetings in Denver and Pullman. He also noted that he turned 81 in 2017, which is the sum of two squares — the year of his birth and his current age.

2017 Retired Faculty Get-together

Math Department retired faculty, spouses and visitors gathered again for the annual picnic at the home of Bill and Martha Jones in August 2017 with much assistance from the Holley and Bonan-Hamada families. Sitting: Jerry Malitz, Muriel Briggs, Wolfgang Schmidt. Standing: Kent Goodrich, Bill Jones, Doris Goodrich, Don and Dorothy Monk, Sally Ellis, Seth Malitz (behind), Susan Malitz, Connor, Cathy, and Ed Bonan-Hamada (visiting alums), Judith and Arlan Ramsay, Walter Taylor, Carol and Henry Hermes, Frieda and Dick Holley, Jean Hodges, Martha Jones.

Giving

2016 - 2017 Donors to the Mathematics Department

The Mathematics Department is deeply grateful for the generous contributions by the donors listed below.

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It is the gifts of previous donors that has allowed the Department to provide its students with an excellent education and crucial financial support.

Online gifts can be made at math.colorado.edu/alumni.

Send gifts by mail to:
CU Advancement/CU Foundation
1800 Grant Street
Denver, CO 80203

Please contact our development coordinator Jazmin Brooks, Jazmin.Brooks@colorado.edu, or our chair, Professor Sasha Gorokhovsky, alexander.gorokhovsky@Colorado.edu, to discuss giving opportunities.