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Cal Poly Pomona

Mathematics and Statistics

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Chair's Message

Berit Givens

Welcome to Cal Poly Pomona's first fall semester! The Department of Mathematics & Statistics is very busy right now, with new semester versions of classes, changed prerequisites, and a variety of combined or modified classes. I know that some (a lot?) of this has been confusing, but our faculty and staff have done an outstanding job to resolve issues as they arise.

One of the changes under semesters is the introduction of a new course MAT 2250, that combines linear algebra and differential equations. Although many people do not realize it, the fields of linear algebra and differential equations are deeply linked. Understanding vector spaces leads to a deeper understanding of the vector space spanned by the solutions of a differential equation. The differential operator is an important example of a linear transformation. I am excited for these connections to be more explicit for students under the new course structure.

If you find yourself needing a break from coursework and enjoy being challenged by solving fun problems and puzzles, I recommend looking at journals like the *College Math Journal* (CMJ) and the *MAA Monthly*, which have a section in each issue dedicated to interesting problems. One recent puzzle in the CMJ challenges you to prove the following claim: Given a convergent series whose terms are positive real numbers, there exists a subsequence of terms that sums to an irrational number. (This problem's solution is in the current issue of the CMJ.)

The Department of Mathematics and Statistics faculty and students are always participating in interesting activities, some of which are highlighted in this newsletter. I hope that you find inspiration in these stories to get involved with something related to mathematics, statistics, or the department's clubs and other activities. Good luck on finals and I'll see you all in *LATE* January!

We welcome two new tenure-track faculty members to the department!

Anne Cawley



Anne Cawley is a Southern California native. She earned her Bachelors in Mathematics and Masters in Mathematics at CSU Long Beach. She worked as a part-time math instructor at Santiago Canyon College before deciding to pursue a Ph.D. in Mathematics Education. She packed up and moved across the country to attend the University of Michigan. Her love of teaching and connection to the Cal State system brought her back every summer, when she taught as an adjunct for the Early Start Mathematics program at Cal State Long Beach. She enjoys the challenge of showing students how to see mathematics as a fun and curious activity, rather than just another class. Her research areas include mathematics instruction in post-secondary institutions (specifically developmental mathematics), student experiences in post-secondary mathematics classrooms, and thinking about equity and access for mathematics students.

In her free time, Anne loves to travel, hike, cook, play trivia games, go to the beach, and is a devoted soccer fan. From a young age, Anne made it her goal that, whenever possible, she would try McDonald's in any new country that she visited. So far she has "enjoyed" McDonald's in 22 different countries.

Anne is very excited and honored to return to the Cal State system and give back the same community that helped to transform her to the teacher and researcher that she is today.



Cristina (Crissy) Runnalls

Cristina (Crissy) Runnalls grew up in central California and received her B.A. in Mathematics from CSU Fresno. She then braved the icy wilds of Iowa to receive her M.S. in Mathematics, and later Ph.D. in Mathematics Education from the University of Iowa. Though early on she dabbled in topology, midway through her graduate career she switched programs to work on her true passion: Mathematics Education. Her research focuses on the intersection of language and mathematics in the classroom, and specifically how these ideas impact emergent bilingual and multilingual students. A secondary focus of her research lies in teacher education, and how to help education students balance content, pedagogical, and cultural knowledge as they prepare to teach.

In her spare time, Crissy enjoys exploring new places, gaming, cooking, baking, playing with her cat, and watching hockey with her husband (go Leafs!). Crissy is excited to be joining the faculty at Cal Poly Pomona, and has been appreciating great positive interactions with students, faculty, and staff. She has also been enjoying the warm weather, sunny days, and mountain views from her office!

Coast to Coast and Beyond

Stacy Brown

During my sabbatical, I traveled all over!

Portland State University

(Oregon): In January, I spent a week observing pre-service elementary teacher mathematics courses being taught with a social justice curriculum.

San Diego, CA: In February, I presented two research papers at the *Conference for Research on Undergraduate Mathematics Education (RUME)*, held by the SIGMAA on RUME. The first paper was on findings from my research on students' proof scripts. The second paper was a theoretical paper on inquiry-based learning and equity-oriented instruction. This paper went on to win the best paper award—a high point in my career that I am still shocked about.

Kristiansand, Norway: In April, I traveled to the University of Adger to present a research paper on my comparative studies of students' and mathematicians' metatheoretical reasoning at the INDRUM 2018 conference, the Second Con-

ference of the International Network for Didactic Research in University Mathematics. This paper was part of a series of papers in the linear algebra and logic research group. Participants in our session were from Greece, Tunisia, Spain, Germany, France and the US.

Rutgers (New Jersey): Also in April, I presented a paper from my studies of students' reasoning about contradictions. This paper was presented to the *Proof Comprehension Research Group* at the Graduate School of Education.

As an aside, in April it is still snowing and icy in Norway, with temperatures close to freezing. When I left Los Angeles it was 85 degrees; but when I arrived 26 hours (and three flights) later in Kristiansand, it was 20 degrees and dropping. Needless to say, it was cold and, being a native Californian, I had no idea how to dress appropriately for those frigid temperatures! Traveling from Norway to the east coast, I had a layover in Oslo.

In the background: I took this photo of the Olympic ski jump, for which Oslo is famous. It is a rather shocking feat of engineering, and sadly its tremendous size and steepness are not well captured by my photo.

Sabbatical in Paradise

Ryan Szypowski

For my sabbatical during the 2017-2018 academic year, I returned to the place where I received my doctoral degree: UC San Diego. I took an unorthodox approach to housing during the year, opting to stay in hotels a couple nights a week and commuting to and from my house in the Inland Empire the rest of the time. To some, this would seem like a ridiculous solution; but for me, it was reminiscent of my first two and a half years at Cal Poly Pomona, just in reverse. I didn't generally stay in fancy hotels, but I did make sure to choose ones that had relatively easy access to the beach. The sunsets over the ocean sure are beautiful.

While at UC San Diego, I focused on continuing past re-

search with my Ph.D. adviser Dr. Michael Holst and teaching a handful of classes throughout the year, while making sure to regularly attend the Computational Mathematics Seminar, where I learned about lots of interesting topics. The research was focused on adaptive methods in the finite element exterior calculus framework. For teaching, I instructed over 1,000 students in total, with one class having just over 300 enrolled. At UC San Diego, the culture is that students give applause at the end of the final lecture, and I have to say that having that many students cheer for you feels pretty darned good. And the best part was that I didn't do a single bit of grading the entire year!

AMS Fall Sectional 2018

Alan Krinik

The American Mathematical Society (AMS) hosts sectional conferences each fall and spring. At the Fall 2018 Sectional Conference at San Francisco State University, our own Professors Alan Krinik and Randall J. Swift co-organized an AMS Special Session on Markov Processes, Gaussian Processes and Applications. This session had three speakers present two talks from Krinik's *Research Group on Markov chains, processes and linear algebra*. Members of this group include:

Current undergraduate students: Malachi Demmin, Christine Hoogendyk, Stevel L. Marquez and David Perez

Current graduate students: Brittney Marian (BS, 2018) and Jeffrey Yeh (BS, 2017)

Former students: Yoseph Dawit (BS, 2018), Mark Dela (MS, 2011), An Do (BS, 2011), John Kath (MS, 2001), Chon In (Dave) Luk (BS, 2018), Lilit C. Moss (formerly Lilith Chemenyan, BS, 2010 and MS, 2012), Lyheng Phey (BS, 2018), and Tanner Thomas (BS, 2018)

The session also had talks from Cal Poly Pomona professors Adam King and Jimmy Risk.

The next AMS sectional conference will be at the University of Hawaii at Manoa, Honolulu, HI on March 22-24, 2019. The deadline for submitting an abstract is January 29, 2019. Details can be found on the AMS webpage: www.ams.org

MAA Fall Sectional 2018

Stacy Musgrave

The Mathematical Association of America (MAA) also hosts sectional meetings each fall and spring. This fall, the MAA Fall Sectional meeting was held locally at Scripps College in Claremont, CA on October 28, 2018. Our own Professor Stacy Brown was a featured speaker and she gave an inspiring talk asking the mathematics community to take a critical eye to our teaching practices with the aim of improving equity in mathematics education.

The next MAA Sectional meeting will take place on Saturday, April 6, 2019 at CSU Channel Islands. It will include a Student Poster session, invited talks (including one to be given by our own Teaching Award winner Prof. Jennifer Switkes), and more. Keep posted on updates for submissions at the MAA Southern California-Nevada Section webpage: <http://sections.maa.org/socalnv/>

Joint Mathematics Meetings 2019

Alan Krinik and Stacy Musgrave

The Joint Mathematics Meetings (a.k.a., the largest annual conference for mathematicians) will be held in Baltimore, MD this coming January 16-19, 2019. Our own Cal Poly Pomona faculty and students will be giving the following presentations:

Wednesday 1/16

10am: Stacy Brown will present “Advancing Research on Undergraduate Mathematics Education”

3:15pm: Jenny Switkes will talk about “Mini Research Projects in a Collaborative Classroom Environment”

Thursday 1/17

1-3:50 pm: Alan Krinik, Randall Swift and Chrstian Krattenthaler (Univ. of Vienna, Austria) co-organized an AMS Special Session on Lattice Path Combinatorics and Applications. Within this session, Alak Krinik will present work done with CPP students and external collaborators on “Generalized ballot box problem and fluctuations within a strip”

3:30 pm: Berit Givens will speak on “A sequence of integrals of Fibonacci polynomials”

5:30 pm: Robin Wilson will serve as a panelist on the National Association of Mathematicians (NAM) and the National Security Agency (NSA) Special Presentation entitled “Town Hall Meeting on the Status of the African Diaspora in the Mathematical Sciences”

Friday 1/18

9 am: John Rock will present “RIP: The Best Approach to Integration by Parts”

10:20 am: Jeffrey Yeh (graduate student) will present on “Optimal Vehicle Fleet Size and Fleet Management Control”

3:20 pm: Jenny Switkes will give a special presentation as an MAA Teaching Award Recipient entitled “When a mathematics department connects”



Baltimore Convention Center. Source: <http://www.bccenter.org/downloads.php?CID=4>

Saturday 1/19

9 am: Robin Wilson will serve on a NAM (National Association of Mathematicians) Panel Discussion entitled “NAM 2019-2069: Where Do We Go from Here?”

10:40 am: Cristina (Crissy) Runnalls will speak about “A Formative Assessment of Formative Assessment: Exit Slips Over the Years”

1:30 pm: Briana Foster-Greenwood will present “Decomposing Rings of Generalized Graph Splines”

It’s not too late to register for the JMM! For the largest savings, do so by December 27 (midnight EST). http://jointmathematicsmeetings.org/meetings/national/jmm2019/2217_reg

Cal Poly Pomona at Pomona Hope

Robin Wilson

This fall Cal Poly Pomona's Department of Mathematics and Statistics has been taking on a new adventure. In an effort to extend our department's reach into the local Pomona Community, Dr. Robin Wilson has offered a service-learning course (MAT 2990S) titled *Math Literacy, Access, and Community*. This fall, the course has focused on developing, implementing, and maintaining an after-school peer-to-peer math enrichment program at Pomona Hope, a community non-profit organization based in Downtown Pomona. The goal of the program has been to provide a safe space where middle- and high-school students can come after school to find support for their mathematics development; to develop and deepen mathematics knowledge, confidence, and interest in mathematics among students at Pomona Hope; and to create a supportive community of mathematics learning at the Pomona Hope site that extends beyond the classroom.

At the Pomona Hope site we are offering a math workshop for middle-school students once a week. The workshop is run by three Cal Poly Pomona mathematics majors (Julieta Segura, Jeanette Medrano, and Rachel Gray) and one University of LaVerne mathematics major (Jajaira Sequeira) and is supervised by Dr. Robin Wilson from Cal Poly Pomona and Dr. Gail Tang and Dr. Emily Cilli-Turner from the Mathematics Department at the University of LaVerne. The students are all planning on going into the classroom to teach mathematics at different levels, and this class provides a learn-by-doing experience where they get to put their developing knowledge about math pedagogy and content into practice.

Our group meets twice a week at Pomona Hope, on Mondays and Wednesdays. On Mondays we co-plan for our Wednesday workshop with three high school students at Pomona Hope. For the curriculum we are using the workbook "Cryptoclub: Using Math to Break Secret Codes" by Janet Beissinger and Vera Pless. During our planning sessions, the college and high school students go through the workbook tasks together, and then decide how to deliver



Professor Robin Wilson with Pomona Hope workshop leaders from CPP and Pomona Hope.

the content to the middle-school students and decide who will lead the tasks during the Wednesday session. We've all been having fun encrypting and decrypting messages using different encryption schemes, and designing games. Wednesdays are the "big day" when we teach the lesson to the middle-school students. Things don't always go as planned, but at the end of the 40 minutes, no one is ready to leave! The class has been fun for everyone involved, and all of us, from the middle-school students to the professors, have grown from the experience.

Our goal is to continue to use our department to wrap our arms around as many young people in our local area as we can, and help them realize the mathematics potential that they all have within. We plan on continuing our work at Pomona Hope in the Spring 2019 semester as well, and while the Pomona Hope site is just about at capacity, more students are welcome to join the course since there are lots of opportunities for math tutoring and enrichment in the Pomona area. We hope you will join us!

Start



Like every season, the students enrolled in the MAT 4950 course ran a math night event for Pomona Unified School District. This semester we were at Simons Middle School, our partner in this adventure for many years.

Gift of Numbers

Greisy Winicki-Landman



Each CPP student had a different game and the local kids moved around between stations with huge smiles on their faces.



There were about 150 local kids in attendance and some of their math teachers. Gift of Numbers is one of the highlights of their academic year and for CPP students it is an early experience as future mathematics teachers.



The event lasted two hours and we are already planning the event for Spring semester.



Everybody is welcome to join us! For more information, contact Greisy Winicki-Landman at greisyw@cpp.edu.



2018-2019 Scholarship Awards

Jill Cannons

On Thursday, October 11, 2018, we held the annual Cal Poly Pomona Mathematics and Statistics Scholarship Reception to honor the accomplishments of the scholarship recipients. Congratulations to the recipients for their success both in receiving an award and in their academic endeavors!

We wish to say thank you to all who took the time to prepare applications or write letters of recommendation, and to the donors and their families for their continued support of our students.



*Huyen Le with Bruce Friedman
(son of Stuart Friedman).*

John and Rosetrina Flaig Mathematics
Scholarship Recipients:

Giao (Selena) Bui
Ruben Hurtado
Huyen Le

Stuart Friedman Memorial Scholarship
Recipient:
Huyen Le

Armando Gallegos Mathematics Endowed
Scholarship Recipient:

Ji Eun (Jean) Kim

Samuel Gendelman Memorial Scholarship
Recipient:

Esteban Escobar

Dr. Emil R. Herzog Department Scholarship
Recipients:

Alexis Ayala
Courtney Ball

Mr. and Mrs. Keith Soon Kim Mathematics and
Science Scholarship Recipients:

Rui Hayashi
Jeffrey Yeh

Kenneth B. Kriege Mathematics Department
Scholarship Recipient:

Jeremy Lin

MAA Teaching Award

Professor Jennifer Switkes won the **2018 MAA Section Teaching Award for Distinguished College or University Teaching**. We have all known Prof. Switkes to be an outstanding, caring, and dedicated educator, and we are thrilled for her to receive this outstanding award.

Additionally, Prof. Switkes is a nominee for the national MAA's 2019 Deborah and Franklin Tepper Haimo Award for Distinguished College or University Teaching of Mathematics. The recipient of the national award will be announced during the Joint Prize Session at the Joint Mathematics Meetings in Baltimore. The session begins at 4:25 pm on Thursday, January 18th, with a reception to follow. We hope you can attend!

We welcome news from faculty, students, and teachers!

Please contact
Dr. Stacy Musgrave,
smmusgrave@cpp.edu,
 for information on how to be included in upcoming issues.

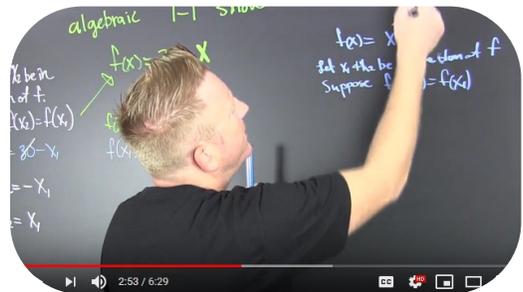
Service Awards

Every year during fall conference, we celebrate the service of CPP faculty and staff. This year, we had the pleasure of honoring the following members of the Department of Mathematics & Statistics:

- 35 Years:** Professor Alan Krinik
- 30 Years:** Lecturer Jeffrey Buddy Garland
- 25 Years:** Lecturer and LRC Director Tracy McDonald
- 20 Years:** Lecturers Wesley Griffith and Jill G. Shirley
- 15 Years:** Professors Berit Givens (also, Department Chair), Amber Rosin, and Greisy Winicki-Landman
- 10 Years:** Lecturers Aileen Lau, Jesus Magana, and John Duong Ngo

Mathbyfives

CPP lecturer Frank Ives' YouTube channel Mathbyfives is about to pass 10 million views! It's currently at 9.6 million views and 63.6k subscribers. With usual traffic of 350,000 views and 2000+ new subscribers per month, it should be soon!



*This issue was produced by the 2018-19 Newsletter Committee:
 Briana Foster-Greenwood, Fernando López-García, Stacy Musgrave, and Laurie Riggs.*