Department of Mathematics Newsletter Spring 2019

Contact Us
Phone: (619) 260-4706
Fax: (619) 260-4293
math@sandiego.edu

Visit Campus
Serra Hall 133
5998 Alcalá Park
San Diego, CA 92110

University of San Diego

DEPARTMENT CHAIR'S CORNER

Greetings from Dr. McGrath. I am handing over the department chair baton to Dr. Cameron Parker starting June 1, 2019. I have enjoyed serving the department, students and USD community for the past three years and thank everyone for all the wonderful contributions they have brought to our department and me.

Starting June 1st, I will be starting a fifteen month sabbatical! I plan to explore many things in my sabbatical. On the professional front I will be learning more about how to incorporate universal design learning into my teaching. On the personal front, I plan to continue my volunteer work at two different animal shelters. The Humane Society and The Greyhound Adoption Center. Finally, I plan to pursue more yoga practice and spiritual exploration in the Buddhist temple in my neighborhood. I wish everyone a lovely summer and see you in Fall 2020!!

Sincerely,
Dr. McGrath

"Develop success from failures. Discouragement and failure are two of the surest stepping stones to success" -Dale Carnegie-

INSIDE THIS ISSUE:

Faculty Member Spotlight

New Addition to the World

Congratulations Dr. Amanda Ruiz and family! Welcome Armando Antonio Varela Ruiz. Dr. Ruiz gave birth on February 19, 2019 to a healthy baby boy. Born at 3:45 p.m. weighing 9.0 lbs.,14 oz., and 21.5 in. Dr. Ruiz and the baby are doing well!

Retirement Celebration

Outstanding Undergraduate Research Mentor Award

Congratulations to our very own, Dr. Lukasz Pruski for being the 2018/2019 Glen D. White, Jr. '78 Faculty Research Award recipient. This award recognizes USD faculty for being mentors with a longstanding commitment to the development of research scholars. Dr. Pruski will be officially recognized at the Honors Convocation Ceremony on May 7, 2019 from 12:30-1:30pm in the Shiley Theater, located in Camino Hall.

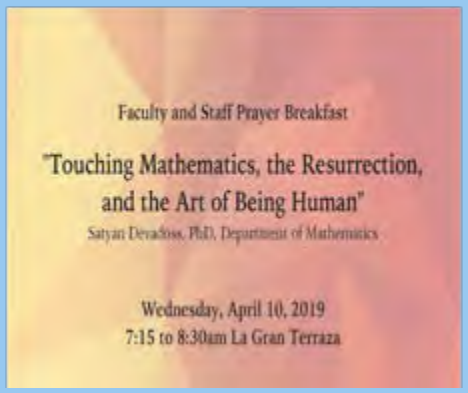
Drinan Award

Congratulations to Dr. Jane Friedman for a well-deserved 2019 Drinan Award for Distinguished Service. We recognize and honor you for your outstanding service contribution to the College and to the University.

Prayer Breakfast

With the recent meteoric rise of technology, mathematics has risen in power. The resurrection of Jesus offers insight from the Christian tradition into the value of our bodies, what it means to live a good life, and even what mathematics will look like in the kingdom of god.

Dr. Satyan Devadoss is the Fletcher Jones Professor of Applied Mathematics and Professor of Computer Science at USD. He is a Fellow of the American Mathematical Society, and recipient of two national teaching awards. His work explores the structure of shape, and its intersection with origami, painting, architecture, genetics, and design. He's a self-proclaimed average husband and an adequate father to four kids.



Math Faculty Seminars

February 8th: Dr. Diane Hoffoss

Dr. Hoffoss will start off the first math seminar of the semester, speaking on "How wide is a manifold?"

February 15th: Dr. Perla Myers

During her Math Seminar session, Dr. Myers spoke about the study abroad course "Mathematics Adventures in Peru". This was her third time taking a group of students to Peru for a community-based learning class experience, in collaboration with the International Center and Proyecto Mochila in Peru.

February 22nd: Dr. Drazen Petrovic

Dr. Petrovic, the newest member of the department, will be discussing "Kasteleyn's Contributions to the Dimer Model Study."

March 14th: Special Lecture joint with Humanities Center with Makoto Fujimura

Makoto is a world renowned abstract artist who is the director of the Brehm Center. He served on the U.S. National Council on Arts, authored books, exhibited at international exhibitions, worked with Martin Scorsese, and more. He's a deep thinker on issues of art and the care of our world. We're lucky to get him to come to USD, to speak on how we can care for culture in the age of culture wars.

March 15th: Dr. Stacy Langton

April 5th: Dr. Satyan Devadoss

Dr. Devadoss will be speaking about "Math Labs" with math majors, Kiley Sprigg (Math, Honors, graduating in May 2019) and Elizabeth Kresock (Math and Computer Science, May 2020) will be presenting their research projects, mentored by Dr. Pruski.

April 12th: Dr. Ahmed Said-Rida

In this seminar, Dr. Ahmed Said-Rida will be speaking about "The Spectral Radius of Graphs."

April 26th: Dr. Lukasz Pruski

Two math majors, Kiley Sprigg (Math, Honors, graduating in May 2019) and Elizabeth Kresock (Math and Computer Science, May 2020) will be presenting their research projects, mentored by Dr. Pruski.

May 3rd: Dr. Jane Friedman & Dr. Cameron Parker

Dr. Friedman and Dr. Parker will have a joint seminar, talking about "Dr. Strangeindex or: How I learned to stop worrying and love the DP measure."

May 10th: John Edmark (Artist/Mathematician/Designer from Stanford)

This is the final math seminar of the 2018-2019 year. Special guest, John Edmark will be speaking about "Exploring the Aesthetic of Spirals." John Edmark teaches in the Design Program at Stanford University. His geometry-based work has been featured and exhibited all over the world, including National Museum of Mathematics, Singapore Science Center, and the Swiss Science Center Technorama.

"Life is not measured by the number of breaths we take, but by the moments that take our breath away."-Maya Angelou-

Where are they now?

Michael Rowell
Class of 2003

Michael is currently a Data Scientist Manager at Microsoft. He received his Ph.D. in Mathematics, Number Theory and Combinatorics from Penn State.

Hobbies: Woodworking, Running/Trail Running, Kayaking, Piano

Michael's Advice:
"The faculty are not only amazing professors, they are incredible people that genuinely care about their students. Take the time to listen to their advice, both math related and otherwise."

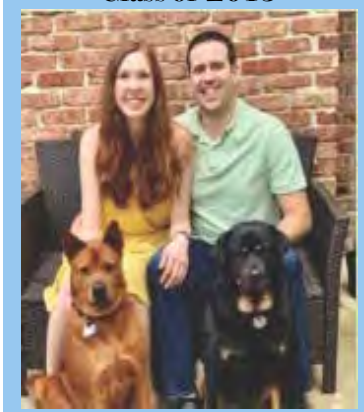
Kevin Pelaez
Class of 2014

Kevin has had various math related professions, from being a high school teacher, to doing some data science work, he even was a USD professor!

Kevin's Advice:
"Stay in touch with your professors! They've continued to be my mentors and have been there for me even after I graduated. Try to take classes with as many professors as you can too. They all have different strengths and can teach you something new about math that might spark an interest."

Hobbies: Sleeping and cooking
Favorite Book: Teaching to Transgress by Bell Hooks

Erin Williams Lopez
Class of 2013



Erin currently works as a medical science liaison. She got her Ph.D. in Biomedical Sciences, double majoring in Mathematics and Biology.

Erin's Advice:
"Go to office hours, it will help dividends with the work and all the math professors are great mentors. Take cryptography if it's offered! Try at least 1 class that you wouldn't plan to during your 4 years. Try getting a summer job at USD, it's really a different type of experience."

Hobbies: Taking her 2 dogs on walks/to the park, traveling to new cities to try new activities, scuba diving.

Favorite Book: Freakonomics by Steven Lewitt

Where are they now?

John Dawdy
Class of 2014

John currently works as an Actuary for Esurance in San Francisco.

John's Advice: ***"Never lose sight of who you are and who you want to be! Set goals, plan ahead, and work hard, but always make time for things that make you happy and the people who are important to you. Life is too short to do something that doesn't make you happy."***

Hobbies: Strolling through farmer's markets, slow pitch softball, and attending sporting events

Favorite Movie: Moneyball

Favorite Book: How to Be an Adult

John Berray
Class of 1994

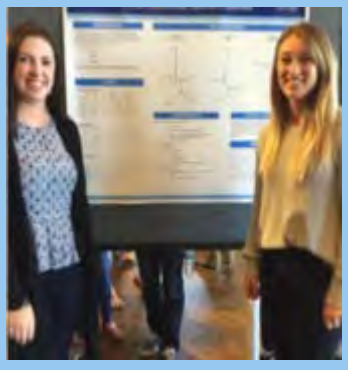
John currently works as a High School math teacher and as a math curriculum specialist in Grossmont Union High School District. He received his Master's in Teaching and learning from National University.

Hobbies: Listening to podcasts, hiking at Cowles mountain, attending education conferences, spending time with kids

John's Advice: ***"Access to higher learning is such a luxury for most people across the planet. Take advantage of this opportunity! Even though it may feel exhausting, you can do it. Take care of your mental and physical health too!"***

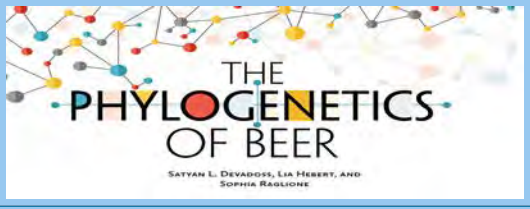
Favorite Book: Teach Like a Pirate by Dave Burgess

Lia Hebert & Sophia Raglione
Class of 2016



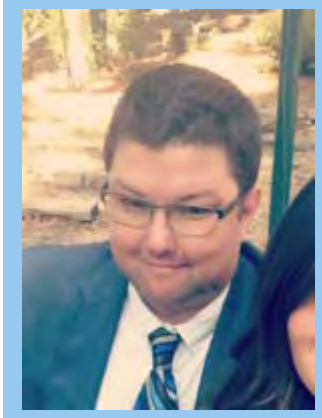
The Department of Mathematics would like to congratulate recent alumna, Lia Herbert and Sophia Raglione, on their joint senior thesis on "The Phylogenetics of Beer" that was published in the April issue of Math Horizons Magazine! Please take the time to find their thesis and give it a read!

https://www.sandiego.edu/news/cas/detail.php?_focus=71718



Where are they now?

Bryce Lyon
Class of 2012

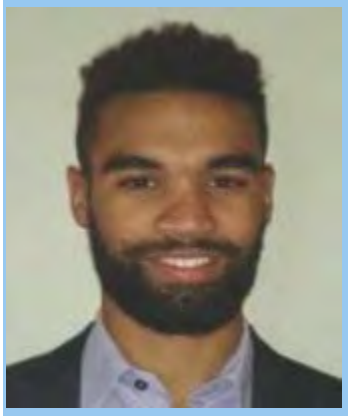


Bryce is a private tutor for Mathematics, Chemistry, English, and Organization. In 2014, he earned his Master's of Education in Curriculum and Instruction from USD.

Hobbies: Writing, listening to music, golf, and video games.

Bryce's Advice: *"You make your own luck. Job opportunities, internships, further degrees don't come along because you got lucky and happened to be in the right place at the right time. They come because you work your tail off and develop a reputation with your professors, advisors, or bosses. Self-care. Make sure you give yourself down time to relax.*

Christopher Quam
Class of 2013



Christopher is currently a SQL Reporting Engineer at ServiceTitan. His previous math related professions include: Marketing Data Analyst, Media Buyer/Account Analyst, and a Youth Math Tutor/Mentor.

Chris' Advice: *"Don't stress too hard. You'll realize how easy you had it when you look back. GO TO THE BEACH."*

Hobbies: Surfing, Basketball, Making music

Favorite Book: How to Be an Adult

Kelly Fromm Woldseth
Class of 2013

Kelly is a High School math teacher of Integrated Math 3 at Poway High School. She's also been a math teacher for 4 years at Mission Vista High School. She earned her Master's of Education at USD, Master's Credential Cohort (MCC) in SOLES, and earned her teaching credential and M.Ed in 2 years.

Kelly's Advice: *"My advice would be for students to stay in touch with professors and classmates from USD and to meet as many people as they can at their first job, because most of those people might have a connection that gets you the next job."*

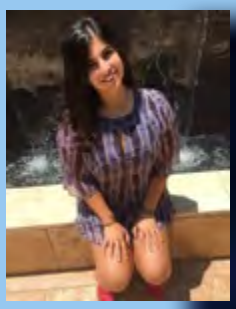
Other: Kelly just had her first baby three months ago! His name is Ty Woldseth & he was born on 12/20/18.

STUDENT SPOT LIGHT

AWARDS & ACCOMPLISHMENTS:

Sarina Haghighat earned the Award for Outstanding Scholastic Achievement in Mathematics.
Kiley Sprigg receives the Award for Outstanding Undergraduate Research Student in Mathematics
Gracyn Otten receives the Award for Outstanding Service in Mathematics

Gracyn: Sarina: Kiley:

"An investment in knowledge, always pays the best interest" – ***Benjamin Franklin***

PUTNAM EXAM:

Congratulations to our six students who participated and did very well in the Putnam Exam. We are so proud of you!

- **Mariana Frangos**
- **Marghece Barnes**
- **Jillian Cooper**
- **Cameron Knutson**
- **Jordan Matuszewski**
- **Shelby Proulx**

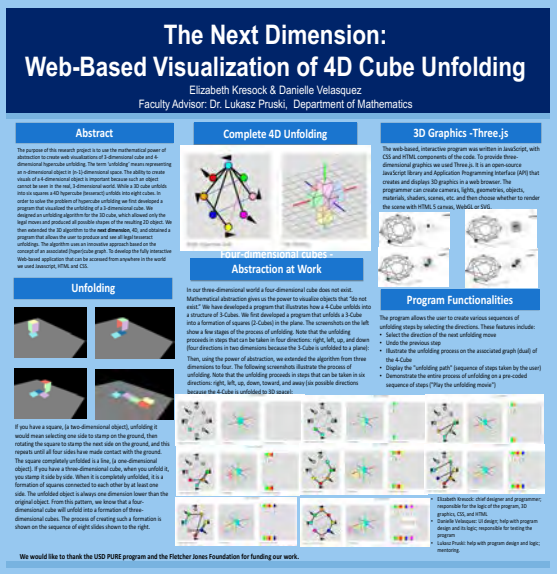
Important Dates!

February 4 – Math Learning Center Opens
March 4-8 – Spring Break
March 23 – Math Competency Exam (10am-12pm; Serra 128)
April 18-22 – Easter Break
May 7 – Honors Convocation
May 15 – Last Day of Classes
May 17-23 – Final Examinations
May 24 – NROTC Commissioning Ceremony
May 26 – Undergraduate Commencement Ceremonies

STUDENT SPOTLIGHT

Creative Collaborations Undergraduate Research Conference

This year we had student presenters discuss their topics at the USD Creative Collaborative Undergraduate Research. There were two projects that were presented by our Math students, in collaboration with Dr. Lukasz Pruski.

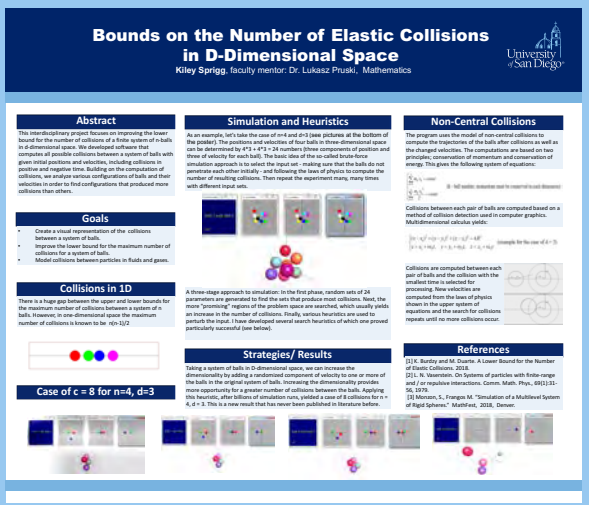


The Next Dimension: Web-Based Visualizations of Cub Unfolding in 3D and 4D by: Elizabeth Kresock, Danielle Velasquez & Dr. Lukasz Pruski

The purpose of this research project is to use the mathematical power of abstraction to create web visualizations of 3-dimensional cube and 4-dimensional hypercube unfolding. The term unfolding means representing an n-dimensional object in (n-1)-dimensional space. The ability to create visuals of a 4-dimensional object is important because such an object cannot be seen in the real, 3-dimensional world. A 3D cube unfolds into six squares; a 4D hypercube (tesseract) unfolds into eight cubes. In order to solve the problem of hypercube unfolding we first developed a program that visualized the unfolding of a 3-dimensional cube. We designed an unfolding algorithm for the 3D cube, which allowed only the legal moves and produced all possible shapes of the resulting 2D object. We then generalized the 3D algorithm to the "next dimension," 4D, and obtained a program that allows the user to produce and see all legal tesseract unfoldings. The algorithm uses an innovative approach based on the concept of an associated (hyper)cube graph. To develop the fully interactive Web-based application that can be accessed from anywhere in the world we used JavaScript, HTML and CSS.

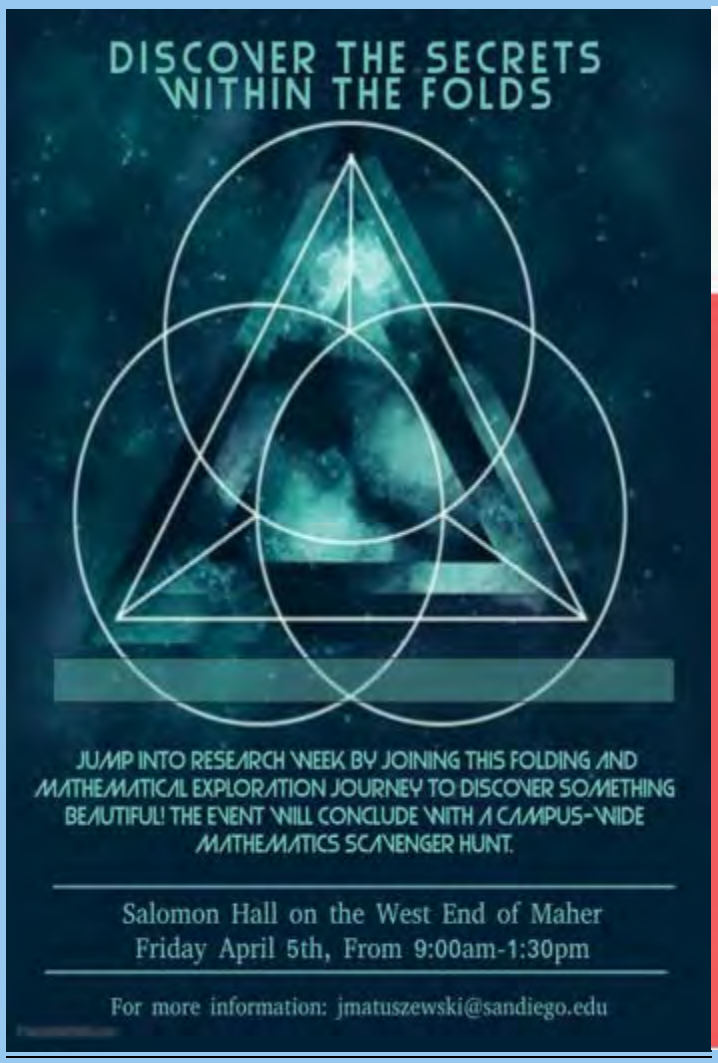
Bounds on The Number of Elastic Collisions in D-Dimensional Space by: Kiley Sprigg and Dr. Lukasz Pruski

This interdisciplinary project focuses on improving the lower bound for the number of collisions of a finite system of n-balls in d-dimensional space. This is an open problem in mathematics whose solution might also be applicable to modeling collisions between particles in liquids and gases. However, our study goes beyond traditional 3-dimensional models known from physics. We developed software that computes all possible collisions between a system of balls with given initial positions and velocities, including collisions in positive and negative time. Building on the computation of collisions, we analyze various configurations of balls and their velocities in order to find configurations that produced more collisions than others. My research yielded a minimum of 8 collisions for a system of 4 balls in 3-dimensional space, a configuration which has never been published before.



For more information on the Creative Collaborations Undergraduate Research Conference visit:
https://www.sandiego.edu/ugresearch/conferences/cc-urc/

Student Led Clubs



Discover the Secrets Within the Folds

Friday, April 5, 9:30 am -1:30 pm

Description: Jump into Research Week by joining this folding and mathematical exploration journey to discover something beautiful! The event will conclude with a campus-wide mathematics scavenger hunt. RSVP by filling out the form: https://goo.gl/forms/HzWcjFfugaSqBIDf2

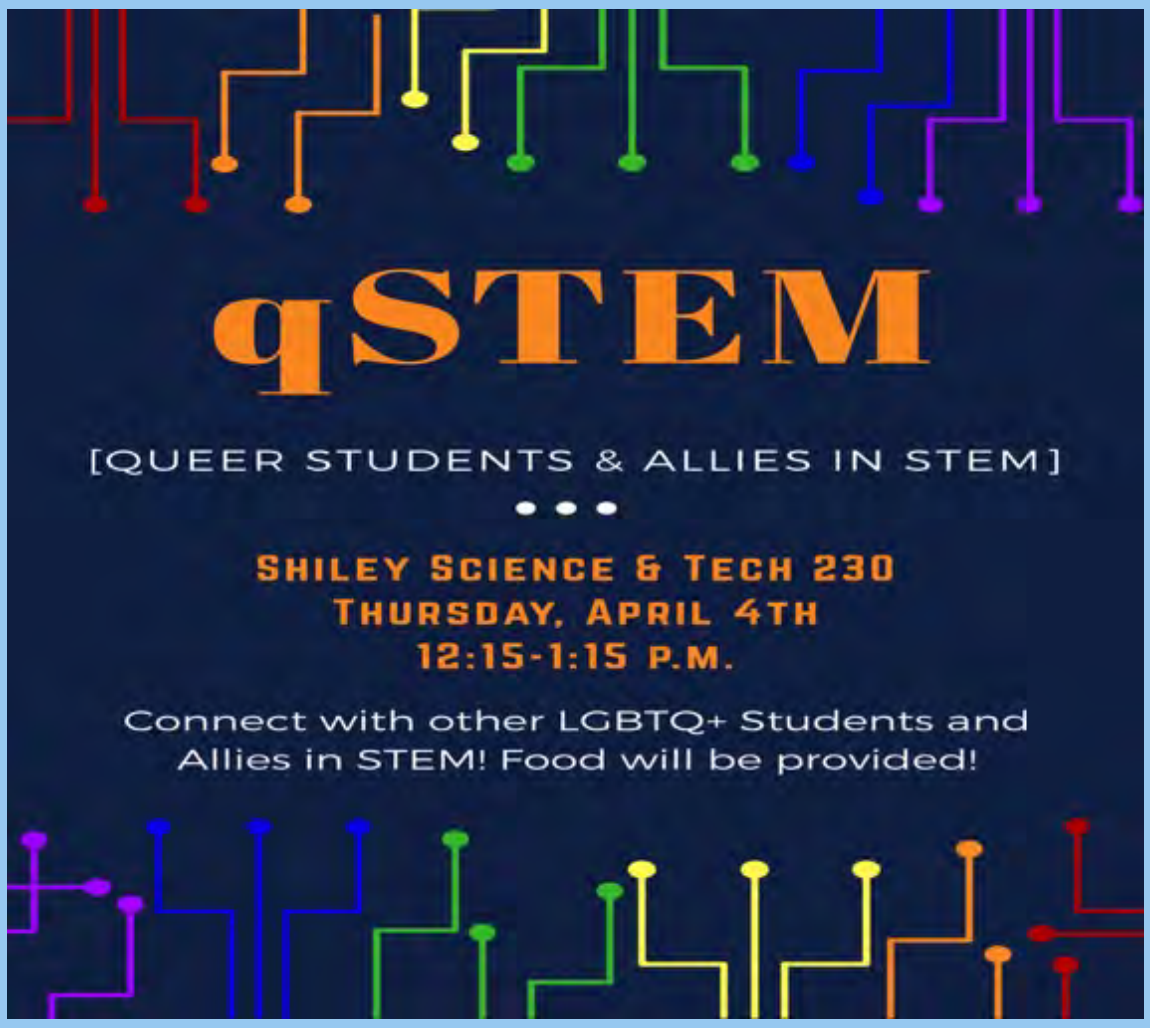
Hosted by: Mathigami, Mathematics Department, College of Arts and Sciences, Office of Sponsored Programs

Celebrate PI DAY with us!

We invite you all to a very special, fun event on Thursday, March 14th at the Colachis Plaza, during "Torero Hours". Stop by to participate in contests and chow down on pie!

Hosted by: S-STEM Scholars, CAS & the Mathematics Department, ACM Club, Math Club & Mathigami Club

Student Led Clubs



New club for all students!

Details: Queer Students and Allies in STEM Meeting

This is a new group for Queer Students and Allies in STEM

Thursday, April 4th, 12:15-1:15pm

Food will be provided!

2019-2020 Opportunities for Mathematics Students

Workshops

Computing4Change, SC19

Computing4Change is a competition for students from diverse disciplines and backgrounds who want to work collaboratively to 1) learn to apply data analysis and computational thinking to a social challenge, 2) experience the latest tools and techniques for exploring data through visualization, 3) expand skills in team-based problem solving, 4) learn how to communicate ideas more effectively to the general public. The competition runs from November 16-22, 2019 in Denver, CO. Details and Application can be found at https://www/sighpc.org/for-our-community/computing4change

Topical Workshop: Mathematical Optimization of Systems Impacted by Rare, High-Impact Random Events

This workshop will explore optimization and stimulation approaches to designing, planning, and operating systems impacted by such events. Stochastic optimization is one approach for optimizing such systems, in which the uncertain incomes are modeled with random variables. Rare and high-impact events provide a challenge for stochastic optimization because (1) it is difficult to estimate the likelihood of rare events, (2) estimates of expected values with outcomes that have very low probability but high costs are inherently unstable, and (3) the actual distribution of random events is often unknown. The goal of this workshop is to bring together researchers with different perspectives on optimization under uncertainty to encourage the investigation of new models and solution approaches that address these and related challenges.

Program Dates: June 25-28, 2019

Topical Workshop: Perspectives on Dehn Srugery

This workshop will function as a graduate summer school. At its core, the school will feature a sequence of mini-courses delivered by a cast of leading experts and distinguished expositors. The course will unveil Dehn surgery and this suite of techniques to the next generation of researchers in the area. The school will additionally feature guided problem sessions and special presentations on the role that computation plays in the field. While targeted at graduate students, the school welcomes applications from qualified future and former graduate students, as well. The main goal will be to enjoy a stimulating week of exploration around a fascinating and active area.

Program Dates: July 15-19, 2019

2019-2020 Opportunities for Mathematics Students

NSF Research Experience for Undergraduates (REU) Site: Cyberinfrastructure (CI) Research 4 Social Change

The CI Research for Social Change REU at TACC is actively engaging 10 undergraduate students each summer for nine-weeks in solving real-world problems of national relevance, teaching them to not only be critical thinkers, but to be creative and reflective as well. Students gain skills in advanced programming and problem solving and use the CI to conduct cutting-edge research in engineering, science, and computational medicine. Research projects emphasize advanced computing as a tool to power discoveries that will impact social change for future generations. The program runs from June 1 – August 2, 2019 at the University of Texas at Austin, Texas Advanced Computing Center. (TACC). Details and Application: https://www.tacc.utexas.edu/reu

NCED REU on Sustainable Land and Water Resources

The aim of the proposed REU on Sustainable Land and Water Resources is to introduce undergraduate student to the key elements of research on land and water resources that are essential to improving management practices, with a focus on Community-Based Participatory Research (CBPR) and diverse interdisciplinary research teams. Students will work on one of three teams on projects that integrate Earth-surface dynamics, geology, hydrology and other interdisciplinary team-oriented approach that emphasizes quantitative and predictive methods, CBPR, indigenous research methods, and traditional ecological knowledge.

Projects take place on the main campus of the University of Minnesota, Minneapolis; on the Fond du Lac Reservation in Northern Minnesota; and at Salish Kootenai College on the Flathead Reservation in Montana. Students in Civil Engineering, Earth Sciences, Hydrology, Chemistry, Biology, Ecology, Sustainability, Mathematics, and related disciplines are invited to apply.

The deadline to apply is March 8, 2019 and the program dates are: June 10 – August 16, 2019. Visit http://reuslawr.wordpress.com for more information and application.

Research Experience for Undergraduates in Astronomy and Astrophysics

This program allows students to work with researchers in the Astronomy Department and the Astrophysics group of the Physics Department. Research projects may include Neutrino astrophysics, observational stellar astronomy, observational Interstellar Medium, and extragalactic astronomy. The program runs for 40 hours per week for 10 weeks. Participants will receive $5000 plus food stipend, travel support to and from Madison, WI, apartment housing, and professional development workshops. For more information visit http://www.astro.wisc.edu/undergrads/uw-madison-reu-program or contact reu@astro.wisc.edu.

Math 494 Cryptography & War – How Mathematicians Saved Democracy

This course, taught by Dr. Cameron Parker in London will cover the exciting field of creating and breaking ciphers, from its early wartime origins through its current everyday use in the internet age. Our focus will include number theory, group theory, probability, statistics, and information theory. We will take several excursions around the London area, focusing on World War II and the devastating effects it has on the city and its citizens. This will remind us that the problems we are working on are not just interesting abstract questions, but were solved by people under great stress at a time when their very way of life was being challenged. The course runs from July 17-August 17, 2019 and costs %5,070. Applications are due by February 20, 2019. Email the Study Abroad Coordinator, Brittany Williams at bwilliams@sandiego.edu for more information.

2019-2020 Opportunities for Mathematics Students

Career Development

Summer Internship Award

The Summer Internship Award supports eligible undergraduate USD students participating in meaningful summer internships, undergraduate research, or career-related community service. This opportunity offers up to $3,000 to offset living, transportation or other expenses associated with participating in a summer internship. Visit https://www.sandiego.edu/careers/undergraduate/summer-internships.php for more information. The deadline to apply is March 31, 2019.

San Diego Technology Torero Trek

Torero Treks are opportunities for University of San Diego undergraduate students to engage in career exploration by visiting leading companies across the nation. The San Diego Technology Trek is on April 5th, 2019 from 8 am to 5:30 pm and the deadline to apply is March 10, 2019. We will be visiting Tandem Diabetes, which develops insulin pumps and other products; Intuit, a business and financial software company that develops financial, accounting, and tax preparation software; and Sony Electronics, a multinational corporation that produces gaming, entertainment, and financial services.

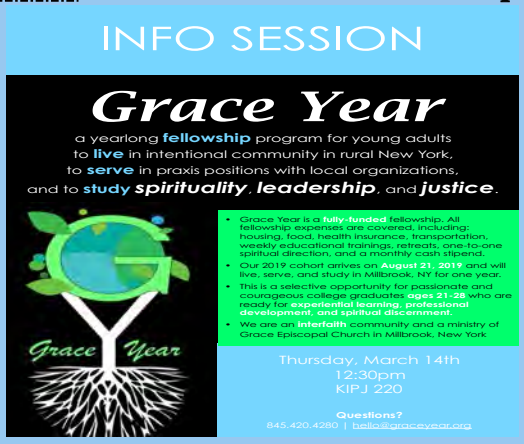
Pre-med summer Europe

This internship allows for pre-med and pre-health students to shadow physicians un Europe's best hospitals. Visit http://www.atlantisglobal.org for more information.

Summer Course- Study in London!

For more information visit:
https://www.sandiego.edu/international/study-abroad/programs/short-term-opportunities.php#summer

OTHERS: The Grace Year Fellowship Program



Pathways to Teaching

Events and Announcements

Math Coffee Hour

Come join our Math Coffee Hour, every Monday from 2:30-3:30pm in the Math Department Lounge located in Serra Hall. Talk to faculty, friends, and enjoy some free coffee and snacks!

Gold Green Office Certification

The Department of Mathematics has received a Gold Green Office Certification through the Green Office Program! We're proud to receive such an accomplishment and we will continue our efforts to aim for the platinum status.

First-Generation Club

Are you looking to build community with other first-gen students? Join USD's First Generation Club on Thursday March 28 from 12:15-1:15 at Serra Hall 217! Food will be provided.

Math Learning Center

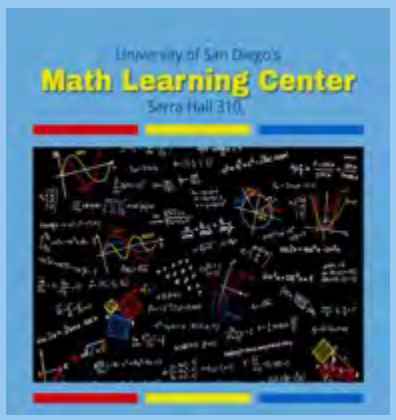
Need help with math? Come to the Math Learning Center in Serra Hall 310! You can get help with these courses:

Math 90, 112, 115, 130, 150, 151, and 250

The MLC is open:

- Mon/Wed: 10:30am-7pm
- Tue: 10am-7pm
- Thurs: 11am-7pm

For more information about tutors and schedule, please visit: https://www.sandiego.edu/cas/math/resources/math-center/



Events and Announcements

MAA SoCal Sectional Meeting

This Spring 2019, the MAA will be holding its SoCal sectional meeting at Cal State Channel Islands. This awesome event will take place on Saturday April 6, from around 8:30am - 3:30pm. More information here:

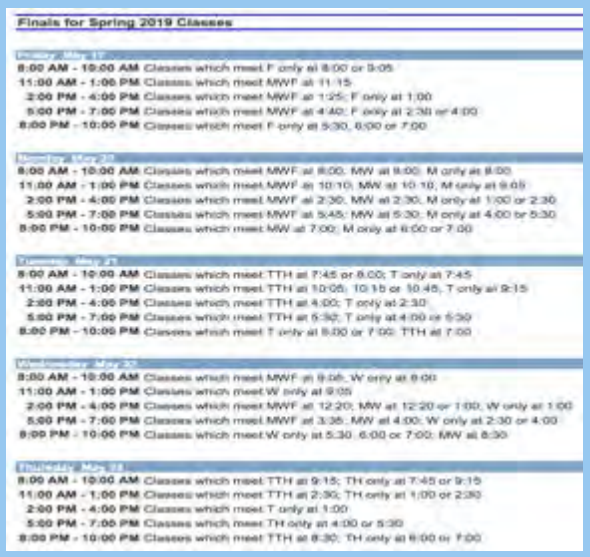
http://sections.maa.org/socalnv/Meeting2019Spring.html

The deadline for POSTER or TALK contributions is Thursday March 21 at noon! The deadline for pre-REGISTRATION is April 1 at 5pm. There is a registration fee ($15) and student lunch ($10).

Dr. Satyan Devadoss would be thrilled to use the Fletcher Jones Endowment to help cover costs for student registration, student lunch, and transportation costs (covering gas money and parking). Please email Dr. Devadoss if you plan to go.

Spring 2019 Finals Schedule

Finals are approaching us! Here is the 2019 Spring final exam schedule. For more details, please visit: https://www.sandiego.edu/registrar/registration-information/webreg.php



End-of-the-Year Party

The Department of Mathematics will wrap-up the school year with its End-of-the-Year party to celebrate everyone's hard work and accomplishments throughout the year. It is a celebration, for our most wonderful majors, faculty members, staff, alumni and friends.

Saturday | May 11th | 2:00 p.m. – 5:00 p.m.
@ Pruski's Residence