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Welcome Back!

Welcome to The Goodsell Gazette; now that school has started, we hope everyone is as excited to spend time in the Mathematics and Statistics Department as we are! There's a lot to look forward to this year: new professors, classes sure to inspire curiosity and challenge you throughout the term, and department events both large and small. Published every other week during the term this newsletter will keep you informed of social and scholarly activities, visiting speakers, comings and goings in the department, your colleagues' comps talks and job and research opportunities. To subscribe send an e-mail to sjandro.

Ice Cream Social

Come one, come all to the Department of Mathematics and Statistics Ice Cream Social this Friday afternoon at 4:15pm, just outside the CMC. Help us celebrate the beginning of a new year by eating ice cream! Bring your friends! We hope to see you there.

Meet Your New Professors!

Kate Hake

Kate, originally from northern California, went to college at Loyola Marymount University before going on to receive her PhD at the University of Califonia, Santa Barbara. Kate is interested in many aspects of math, but specifically topology and knot theory. Her research focuses on modeling physical items and adding constraints to the physical properties of knots like thickness and length. During her free time, Kate likes to stay active by hiking and doing yoga. She also loves baking and especially decorating cakes, she even decorated a few wedding cakes this summer! Kate is excited about teaching at Carleton and working with smaller class sizes, so she can really get to know her students. She is teaching Calc II and Calc III and supervising a comps group this winter and spring.

Coming Next Time: Meet our new Professors   Alex Barrios, Mike Cohen, and Caroline Turnage - Butterbaugh!

Kenan Lecture: Modeling Honey Bee Colonies

Sam Patterson, William R. Kenan Jr. Professor of Mathematics, Carleton College
Thursday, September 20, 4-5pm, CMC 206

Much of the world's food production is dependent on pollination by honey bees.   But the number of colony failures has sharply increased in recent years and the number of colonies worldwide is declining. No single factor has been identified as the cause of these failures.   Rather, an interplay among a few factors seems to be killing the colonies.   Recently mathematicians have begun to develop models to identify which combinations of stressors may be causing the colonies to collapse.   This talk will explore a few of these models.

Math and Stats Colloquium: Graduate Student Visitor Kim Klinger-Logan

Kim Klinger-Logan, University of Minnesota
Tuessday, September 25, 4-5pm, CMC 206

Kim Klinger-Logan, a graduate student in number theory at the University of Minnesota, will visit us on Tuesday, September 25 for several events including lunch with students and a colloquium talk. A detailed schedule will be announced via the mast-interest and mast-majors Google groups and around the Department. To learn more about Kim and her mathematical interests, you can visit her webpage at http://www-users.math.umn.edu/~kling202/. If you are interested in having lunch with Kim, please email Andy Poppick (apoppick@carleton.edu). Stay tuned for more information!

SWiMS

The Society for Women in Mathematics and Statistics (SWiMS) is a community of female and non-binary students and professors at Carleton College. If you are interested in joining SWiMS and partaking in our events throughout the year, please email Caroline Turnage-Butterbaugh at cturnage@carleton.edu. We will be in touch soon with information regarding our first event of the 2018-2019 year!

Putnam Signup Time is Here!

Fall term is just getting underway, but it 's already time to register for this year 's William Lowell Putnam Mathematical Competition. As many of you know, the €œPutnam €⊡ is the granddaddy of all college math problem-solving contests -- a challenging exam focusing on mathematical insight and ingenuity. Typically, several thousand undergraduates across the United States and Canada participate, and the median score is usually less than 10 out of a possible 120. Whether you 've taken the exam before or are considering taking it for the first time, you 'll probably enjoy getting experience with past Putnam problems (and learning some new problem-solving strategies) at our weekly problem-solving group, which meets every week on Wednesday, from 4:30 to 5:30 in CMC 328.

This year the Putnam will be held on Saturday, December 1. That 's during our winter break, but we 'll gladly make arrangements for you to take the Putnam at another college or university. If you 'd like to sign up, or just have questions about the contest, contact Rafe Jones in person (CMC 226) or via email

(rfjones). Act soon! Although the Putnam is still more than two months away, we have to submit a participant list soon, so your deadline for signing up is September 28.

Problem Solving Group

If you have always really enjoyed the problem-solving aspect to your classes, then the problem-solving group is just for you. Come join us in CMC 328 from 4:30-5:30 on Wednesdays, where we will work on solving some fun and challenging math problems together, and learn some strategies for solving them. Students at all stages of their Carleton careers are welcome.

Rafe Jones will be hosting the session. You can contact him for more information at (rfjones@carleton.edu).

Math GRE Practice Sessions

If you're thinking of applying to grad school in math, you may know that there is a GRE Math subject exam, beyond the math section of the ordinary GRE, and that this subject test is often required by grad schools. Throughout the school year at Carleton, we offer special training and practice for this Math subject test, and in the Fall term Owen Biesel will be hosting our weekly practice sessions. Here are the dates and times:

12-1pm on 9/18, 10/2, 10/16, 10/30, and 11/13 (common time on even-week Tuesdays)
5-6pm on 9/24, 10/8, 10/22, and 11/5 (Mondays of weeks 3, 5, 7, and 9).

The location is **CMC 319**. Feel free to drop in at any or all of these sessions, or contact Owen at obiesel@carleton.edu for more information. Hope to see you there!

Comps Fellowships

The Office of Student Fellowships is accepting applications for Senior Comps Fellowships. Ten awards of up to $2,000 apiece for students to pursue comps research over Winter Break are available. Applications (which draw directly on a comps proposal) are due October 15, and decisions will be announced October 29. For more information, visit:
https://apps.carleton.edu/fellowships/carleton_fellowships/comps/.

Upcoming Events

Week 1, Friday, September 14, 4:25pm
Ice Cream Social - CMC Terrace

Week 2, Thursday, Semptember 20, 4:00pm - 5:00pm
Sam Patterson Talk - CMC 206

Week 3, Tuesday, Semptember 25, 4:00 - 5:00pm
Kim Klinger-Logan Talk - CMC 206

Job & Internship Opportunities

D.E. Shaw & Company, Quantitative Analyst

Quantitative analysts at the D. E. Shaw group apply mathematical techniques and write software to develop, analyze, and implement statistical models for computerized financial trading strategies. Keen insight and innovation are essential for creating solutions for trading profitably in markets around the globe. Specific responsibilities range from examining trading data to increase profitability, decrease risk, and reduce transaction costs, to conceiving new trading ideas and devising the simulations needed to test them. Successful candidates have traditionally been exceptionally talented students at the top of their respective math, computer science, and other technical and quantitative programs. Analysts possess a wide range of quantitative and programming abilities necessary to solve challenging problems that are critical to the firm 's continued success. Interested students should apply directly online, at: https://www.deshaw.com/recruit/jobs/OC/CarletonCollege.

Trustmark Insurance, Actuarial Assistant Internship

Trustmark Companies is currently seeking Actuarial Interns for our 2019 Summer Internship Program which will run from the end of May through the end of July of 2019. Our interns try out the day-to-day challenges of real actuarial work and contribute to the financial success of our operating divisions by assisting with pricing decisions, experience analyses, and reporting of financial results. The ideal intern should possess strong initiative, be detail oriented and demonstrate excellent oral/written communication skills. Any student who is interested and meets the required criteria (passed at least one actuarial exam, GPA 3.0 or higher, and class of 2020) should apply soon, as we will begin conducting phone interviews later in September. For the complete job description, along with a place to apply/upload resumes, visit: https://trustmark-hr.silkroad.com/epostings/index.cfm?fuseaction=app.jobInfo&version=3&jobid=301626. The main company website is here: http://www.trustmarkcompanies.com. (Brought to you by Carleton alum Ted Kuhn '09)

Problems of the Fortnight

Welcome to the 2018-19 academic year at Carleton! Our renowned usual author and caretaker of the Problems of the Fortnight, Mark Krusemeyer, is on sabbatical this fall term, and so I will be humbly filling in with some bi-weekly problems of my own during his absence from campus. You may submit your solutions on paper to my mailbox in the CMC, or else you can email them to me. As usual, solutions are due by noon on Tuesday of the next Gazette week—at present, this means Tuesday, September 25.

To the best of my knowledge, Mark's Big Box O' Prizes has been sealed away in a vault and entombed somewhere deep beneath the Bald Spot, not to be exhumed until his triumphant return in the Winter—so I cannot promise material recompense for correct solutions. However, I can guarantee widespread fame and the adulation of your peers, as submitters of correct solutions will be acknowledged in the upcoming Gazette. In order for a solution to be considered correct, it must come with a clear and thorough mathematical justification. If you submit an incorrect solution, I will do my best to send you some constructive feedback, and your name will not be mentioned, so please don't hesitate to submit an attempt.

This week's problems concern Thog the Caveman and his prized piece of technology: a great stone wheel which is in the shape of a right triangle with vertices $(0,0)$, $(2,0)$, and $(0, 2\sqrt{3})$ (where the units of the coordinates* are measured in cubits). With a great heave, Thog pushes the wheel forward—it rotates clockwise about the point $(2,0)$ until the hypotenuse comes to rest on x-axis. As he continues pushing, the wheel next rotates clockwise about the point $(6,0)$, until the longer leg of the triangle comes to rest on the x-axis. Finally, with Thog's final shove, the wheel rotates clockwise about the point $(6 + 2\sqrt{3}, 0)$, until the side which was originally on the x-axis lies on the x-axis once more.

(1) As the wheel turns, the point on the wheel whose original position is $(1, \sqrt{3})$ traces out a curve. Find the area of the region of the (x,y)-plane bounded above by this curve and below by the x-axis.

(2) Consider all possible points on the wheel, including those which lie on the boundary of the triangle shape. Is there one point which sweeps out the greatest area, as in problem 1? If so, name the point(s) and prove that the area is largest.

-Mike Cohen

* Thog is a simple man—so simple that our mathematical model of his activities does not require a third coordinate axis.