

# Goodsell Gazette

Carleton College

14 April 2017

Northfield, MN 55057

The newsletter for the Carleton mathematics and statistics community

Vol. 35, No. 16



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## Third Week Update from the Math & Stats Department

Since the last Goodsell Gazette, lots has happened in the Math & Stats Department and there is much more to come! On top of their coursework, students managed to organize a math competition for high school students. In other exciting news, Math & Stats students received awards from the Mathematical/Interdisciplinary Contest in Modeling. Over the next couple weeks, look forward to a new major welcome and comps announcement. Keep reading to learn more about these accomplishments, fun events, as well as conference, job, and internship opportunities!

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## Math and Stats Majors Welcome and Comps Announcement

Newly-declared Math or Stats majors are invited to a reception in CMC 206 from 3:30 to 4:00 on Tuesday, April 25. It's a chance to meet fellow majors, both old and new, as well as to get to know professors you might not have met yet. There will be cake! For current juniors (if the promise of cake and company wasn't enough), right afterwards from 4:00 to 5:30 the department will be announcing comps projects for the coming year!

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## Carleton Mathematics Competition

On April 1st, the first Carleton Mathematics Competition for high school students took place on campus. A small group of about 10 Carleton students organized a fun-filled day of individual exams (in algebra, geometry, combinatorics, sequences/series, complex analysis, and number theory), team exams, and an exciting talk on partitions from Mark Krusemeyer. Over 60 Minnesota high school students attended the event. Overall, the competition was a great success and the Carleton group hopes to organize another competition next year! If you have any interest in problem writing or volunteering for the next competition, please contact Liz ([lsattler@carleton.edu](mailto:lsattler@carleton.edu)) for more information.



In picture: Zephyr Lucas, JordiKai Watanabe-Inouye, Moses Mispion, Alice Antia, Ben Matson, David White, Thomas Redding.

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## Mathematical/Interdisciplinary Contest in Modeling Results

Back in January, six Carleton teams of three students each participated in the 2017 Mathematical and Interdisciplinary Contest in Modeling, an international contest with thousands of participants focused on solving real problems using a variety of tools from mathematics and statistics.

Two teams received a designation of "Meritorious Winner" for the ICM, an excellent accomplishment, only awarded to a small percentage of participants. Meritorious winners were Frank Yang, Yuhao Wan, and Il Shan Ng (who worked on the problem of passenger throughput at airport security checkpoints) and Ani Nadiga, Elliot Pickens, and Mitchell Biewen (who worked on recommendations for smart growth strategies for

mid-sized cities). Honorable mention designation went to Marshall Ma, Moliang Jiang and Duo Tao (who also worked on the airport security problem). Congratulations to all participants!

If you would like to learn more about this contest, or if you are interested in participating next year, please talk to Rob Thompson.

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## Mathematical Association of America Meeting

Want to go to a low key and fun math conference for a day? Join Rob for a trip to the North Central Section meeting of the Mathematical Association of America on Saturday April 22 at Anoka Ramsey Community College. Come talk to me or email rthompson if you'd like to go. Talk to me soon, space in the van is limited! More info on the meeting website:

<http://sections.maa.org/northcen/meetings/meetingSpring2017.html>

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## Job & Internship Opportunities

### Work in the Mathematics and Statistics Department Next Year!

Are you looking for a job to fill your work-study hours next year? The Mathematics and Statistics Department is looking for course graders, lab assistants, someone to edit the Gazette, and an office assistant. Applications are due by April 28 and can be found at:

[https://apps.carleton.edu/curricular/math/resources/student\\_worker\\_application/](https://apps.carleton.edu/curricular/math/resources/student_worker_application/)

### National Museum of Mathematics Internships

Are you a college student looking for something fun to do this summer, or do you know someone who is? MoMath is now accepting applications for summer 2017 internships for current college students. Improve your interpersonal and communication skills, explore mathematical concepts, learn valuable job skills, plus have a great time meeting new and interesting people, including top members of the mathematical community. See more at: [momath.org/jobs/internships](http://momath.org/jobs/internships). Please note that internships are unpaid.

### GROW (Graduate Research Opportunities for Women)

Graduate Research Opportunities for Women (GROW) is a conference for women-identified students interested in graduate school in the mathematical sciences. Typically, there are break-out sessions on graduate school experience with grad students, and Q&A on graduate school applications. The panel for the latter usually includes faculty members who are on admission committees.

When: October 13-15, 2017

Where: Northwestern University, Evanston Campus

Details can be found at:

<http://www.math.northwestern.edu/events/conferences/graduate-research-opportunities-for-women.html>

### The Horizons Fellowship

[The Horizons Fellowship](#) supports 10 outstanding university students in their pursuit to become leaders in technology. The program provides immersive software engineering and web/mobile development courses geared towards high-achieving college students. Students need not have a computer science background! The curriculum, developed by ex-Salesforce and Optimizely engineers alongside PhD candidates in computer science, is designed to teach students how to build web, mobile, and desktop applications. There are 4-month semester programs and 3-month summer programs in cities across the U.S.

The program is open to students of any year and any major - candidates with diverse backgrounds and interests are encouraged to apply!

Application process/criteria:

- Currently enrolled in (or recently graduated) an undergrad or graduate university program
  - Submission of resume and standardized test scores on [www.joinhorizons.com](http://www.joinhorizons.com)
  - Series of fit and logic interviews
  - Applications are accepted on a rolling basis
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## Problems of the Fortnight

Having trouble seeing the problem of the fortnight? Try enabling images for the message.

To be acknowledged in the next *Gazette*, solutions to the problems below should reach me by noon on Tuesday, April 25.

1. Prove or disprove:

$$\frac{\frac{1}{100} + \frac{1}{100 \cdot 101} + \frac{1}{100 \cdot 101 \cdot 102} + \dots}{\frac{1}{2017} + \frac{1}{2017 \cdot 2018} + \frac{1}{2017 \cdot 2018 \cdot 2019} + \dots}$$

is a rational number.

2. For the purposes of this problem, define a *tile* to be a trapezoidal region in the plane that is congruent to the one with vertices  $(0, 0)$ ,  $(1, 0)$ ,  $(2, 1)$ , and  $(0, 1)$ . For what positive real numbers  $k$  can you cover a region that has the exact same shape as a tile, but with side lengths  $k$  times as long, by tiles, without overlap? In other words, given an unlimited supply of tiles, for what values of  $k$  can you use those tiles (which you can put down in any orientation) to form “super-tiles” for which every distance is scaled up by a factor  $k$ ? (To solve the problem completely, you should show not only how to do this, but also how you know that you have all possible values of  $k$ .)

Alas, I’ve heard very little about the problems posed March 31, although John Snyder in Oconomowoc did solve the first one. If you are still working on either of them, do submit your solution(s), which remain(s) eligible for a B.B.O.P. prize or prizes. Of course, I’m also looking forward to your solutions to the new problems above. Good luck!

- Mark Krusemeyer



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