



ΓΟΟΔΣΕΛΛ ΓΑΖΕΤΤΕ

Carleton College

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Northfield, MN 55057

The newsletter for the Carleton mathematics and statistics community

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In History: First Carleton Woman Math PhD

Some Carleton math and stats majors go on to get advanced degrees in the mathematical sciences. The first woman to do so (we believe; if someone tried to keep an advanced degree hidden from us, they'd be able to do so) was Bertha (Lauritzen) Mount '62, who earned her PhD at Northwestern University in 1970. The second woman to do so was Emily (Hoel) Moore '70, who earned her PhD from Dartmouth College in 1977, then went on to teach at our sister institution Grinnell College for many years. The third woman to do so was Beverly (Bailey) Hargraves '71, who earned her PhD from the University of Minnesota in 1978.

Gather your team for the Konhauser Problemfest

On Saturday, February 23, the 27th annual Konhauser Memorial Problemfest will take place at St. Olaf. The contest, which is named after the late Macalester professor and legendary problem poser Joe Konhauser, is a premier local problem-solving event. Teams of up to three students get three hours (9 a.m. to noon) to work together on a set of ten challenging and intriguing math problems. The participants then have lunch together while the solutions are graded, and the results are announced right after lunch. The winning team gets to take the famous granite "pizza trophy" home to their college for the year. It's been in residence at Macalester this past year, and it would be great to bring it to Carleton for a year. To sign up for the Konhauser, contact Rafe (rfjones@carleton.edu). Three people can sign up as a team, but individuals are also welcome to express interest -- it should be possible to find you some teammates.

If you want to see what Konhauser problems are like, and get some practice solving them, drop by the problem-solving group, which meets on Wednesdays 4:30-5:30 pm in CMC 328.

Budapest Reminder

Are you interested in going on the Budapest Semesters in Mathematics or Budapest Semesters in Mathematics Education study abroad program next summer or fall? If you are, your first step is to apply here at Carleton! Applications are now available and can be found at the Math & Stats Department's website under Resources > Off-Campus Opportunities. In order to receive full consideration, your application for the program is due to the Carleton Math & Stats Department by February 3. Contact Deanna

(dhaunspe@carleton.edu) with any questions.

A New Study-Abroad Possibility for Mathematics!

Would you like to spend a term in Guanajuato, Mexico? Starting in Fall 2019, there will be a study abroad program in Mexico for undergraduates studying mathematics. This hasn't yet been approved by our Off-Campus Studies office, so some work may be required to make sure that credits transfer. To be eligible, you must have completed Math 210 or 211, and Math 232. Fall semester is Mathematical Modeling and spring semester is Data Science. For more information, see mathsciencesgto@cimat.mx.

Kolenkow-Reitz Fellowship Information Session

When: Tuesday, January 29, 7 pm

Where: Olin 141

The Kolenkow-Reitz fellowship provides research support for Carleton students working with non-Carleton science and math faculty at another institution during the summer break. These research opportunities are intended to encourage Carleton students' development as researchers and their exploration of mathematics and the sciences as a possible career. Awards fund student stipends (\$470/week for full-time work) for up to 10 weeks. This year's application deadline is March 15th. Here's a link to more information about Kolenkow-Reitz: <https://apps.carleton.edu/mathscience/faculty/studentresearchaway/>

Upcoming Events

Week 4, Thursday, January 31, 4pm
Colloquium Talk, CMC 206

Week 5, Tuesday, February 5, 4pm
Colloquium Talk, CMC 206

Week 6, Thursday, February 14, 4pm
Prospective Major and Minor Information Session, CMC 206

Job & Internship Opportunities

Education Analytics, Research Analyst

Education Analytics (EA) is seeking energetic summer interns for their data and analytics team. EA is a non-profit organization based in Madison, WI, that uses data analysis to inform education policy decisions. They partner with school districts, regional offices of education, non-profits, and policymakers to identify ways to improve education systems. This opportunity is for students who have had some statistics classwork and are entering their Junior or Senior year. For more information, visit:

<https://edanalytics.org/careers/research-analyst-internship-l10010>.

RStudio, Summer Internship

The goal of this program is to enable RStudio employees to collaborate with students to do work that will help both RStudio users and the broader R community, and help ensure that the community of R developers is as diverse as its community of users. Over the course of the internship, interns will work with experienced data scientists, software developers, and educators to create and share new tools and ideas. RStudio is recruiting for many projects including Data Science pipelines and ggplot2 enhancements. The application deadline is February 22. For more information, visit:

<https://blog.rstudio.com/2019/01/18/summer-internships-2019/>

Bilingual Education for Central America (BECA)

BECA sends English-speaking volunteers to teach in three community-run bilingual schools located in rural Honduras. Currently, they have teachers from across the US, from Honduras, the Dominican Republic, and Venezuela. In the past, teachers come from Ireland, England, Australia, and other countries as well. They need more math specialists and enthusiasts to take a "gap year" to teach math and other core subjects in Honduran schools. For more information on BECA, please visit www.becaschools.org.

Problems of the Fortnight

To be acknowledged in the next *Gazette*, solutions to these problems should reach me by noon on Tuesday, February 5.

1. A particle moves in the plane so that its position at time t is given, for $|t| \leq 1$, by

$$x = t(t + \sqrt{t^2 + 8}), \quad y = \sqrt{1 - t^2}(t + \sqrt{t^2 + 8}).$$

How far does the particle travel (along its curved trajectory) from the point $(0, 2\sqrt{2})$ (for $t = 0$) to the point $(4, 0)$ (for $t = 1$)?

2. A famous theorem of Lagrange states that every positive integer is the sum of at most four (perfect) squares. (If you allow $0^2 = 0$, you can get rid of the words "at most".) However, those squares aren't necessarily distinct; for example, the only way to write 7 as the sum of four squares is as $7 = 2^2 + 1^2 + 1^2 + 1^2$. In fact, even if more than four squares are allowed, many positive integers (such as 7) cannot be written as the sum of (one or more) distinct squares. Is there a largest such example? That is, is there a positive integer N which is not the sum of (any number of) *distinct* squares, but such that any larger positive integer is the sum of distinct squares? If so, find N (with proof); if not, show that there are arbitrarily large positive integers that cannot be written as sums of one or more distinct squares.

The first problem posed January 11 was solved by Aaron Li, who should stop by CMC 217 some time to pick up an item from the B(ig) B(ox) O(f) P(rices). "Auplume" solved both problems. There was an ingenious attempt on the second problem which gave a nearly, but not quite, correct answer. If the forecast is correct, most of us will be spending almost all our time inside for some time to come - so find a cozy spot and enjoy the new problems!

- Mark Krusemeyer



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