Goodsell Gazette

Carleton College *10 March 2017*

Northfield, MN 55057 *The newsletter for the Carleton mathematics and statistics community* *Vol. 35, No. 14*

10th Week Update from the Math & Stats Department

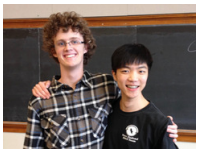
This will be the last Gazette of Winter Term -- the next issue will come out on March 31. So far this winter, the Carleton Math & Stats Department has hired a new professor, several independent comps students and comps groups have presented their findings, and more than a few students have participated in mathematics- and statistics-related conferences and competitions.

There isn't too much going on this week, but read on to find out about a recent math competition at Carleton, to get updates on jobs, internships and summer opportunities, and to take a crack at this issue's Problem of the Fortnight.

Good luck with the end of term, everyone! Have a great spring break!

Pizza Trophy Remains at Carleton

On Feb. 25, five teams of Carls participated in the 25th annual Konhauser Problemfest right here at Carleton. The team of Ben Matson, Isaac Garfinkle, and Michael Stoneman took home first place, and so for the fourth consecutive year the handsome pizza trophy (a granite model of a dissection proof of a theorem in geometry) will remain on campus. Come check it out in the department reception area! Also acquitting themselves admirably were Ben Stone and Ian Seong (second place), Nathan Dalaklis, Will Hardt, and Neeraja Kulkarni (tied for third place), Peter Illig, Liyang Liu, and Frank Yang (seventh place), and Shilin Ma, Weijia Ma, and Emma Qin (tenth place). The top three teams earned cash prizes, and all who participated earned honor and glory.



Summer Math Research at Carleton

Interested in doing research in mathematics this summer? Rob Thompson is looking to recruit a team of students to work on research problems in applied math and geometry. The program will be 10 weeks of full time work, starting right after Spring term. Last summer's projects involved automated jigsaw puzzle assembly, classifying special curves on surfaces, and an industrial problem on 3d scanning. Come talk to Rob to apply and to learn about new (and continuing) projects for this summer!

Job & Internship Opportunities

Naval Nulcear Laboratory: Summer Technical Intern

Glen Perry '07 *(Physics/French and Francophone Studies)* wants students to know about a summer internship at his current employer, Naval Nuclear Laboratory. They are currently seeking a 2018 Naval Nuclear Laboratory Summer Technical Intern. The internship is based in five cities. Naval Nuclear Laboratory summer technical interns are fully integrated into various organizations and assigned responsibilities that will provide them with a real-world experience for planning and executing assignments in their field. Interns may be assigned a variety of technical responsibilities including research and development of new technologies, designing and testing components or

integrated systems, developing and providing training, supporting new construction projects, developing procedures and providing operational support, and working on the examination and disposal of expended reactors. Work assignments will vary annually based on business needs and will be commensurate with interns' knowledge and skills. In addition to developing their technical skills while completing their work assignments, all Naval Nuclear Laboratory interns will present their work to peers and management at the completion of their internship. The application deadline is March 15th. More information can be found at: https://navalnuclearlab.energy.gov/

Career Center: Career Assistant

The Carleton Career Center is looking for new students to join their staff. There are two positions available; one as a general career assistant and another as part of the Hospitality and Recruiting Team. Students must be on campus fall term to be eligible and have the ability to work 10 hours a week. Applications are due tomorrow, so apply quickly! More details can be found through the Tunnel!

Bust Out Solutions: Startup Internship

Bust Out Solutions is a software design and development agency based in Minneapolis, MN. They are a small, independent team of highly-talented software creators with experience building web and mobile apps, games, and websites for clients in a variety of industries. In 2015 they formed a new company, Swing Set Labs, whose main product is Pearl (https://pearlpayments.com), a payment management platform that makes it easy for businesses to collect and manage recurring and one-time payments. Student interns will learn how to work with an established software design and development team to help grow a startup in the payment processing industry. Applications are due March 29. For more information and to apply, visit The Tunnel.

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, March 28 (in other words, right after the break).

1. Is it possible to arrange the numbers $0, 1, 2, \ldots, 15$ in a square pattern so that the sum of the four numbers in any 2×2 square within the pattern is the same? (For example, if you try starting the pattern as follows:

3	7	2	9
5	8	a	?
4	b	?	?
?	?	?	?

you will find it impossible to finish: The four numbers in the upper left-hand corner add to 23, so you would need $7+2+8+a=23$ and $5+8+4+b=23$, which yields $a=b=6$. But the number 6 can only occur once in the pattern, so this cannot be.) If it is possible, find a solution for which the smallest number adjacent (horizontally) to 0 is as small as possible. If it is not possible, show why not.

2. Let f be a non-negative, continuous function whose average value on the interval $[0, 1]$ is 1. What are the possibilities for the average value of the function f^2 on that same interval?

This wasn't a good fortnight for solutions. For the problems posed February 24, John Snyder in Oconomowoc solved the first using the *Geometry Expressions* software package, then reverted to *Mathematica* to get the answer for the second (determinant) problem. Meanwhile, Liyang Liu submitted a solution to the first problem posed February 10, and he should stop by CMC 217 some time to collect a B.B.O.P. item. Good luck on finals and such, and have a wonderful spring break!

- Mark Krusemeyer

• • •

Editors: ***Saahithi Rao, Steve Kennedy***
Problems of the Week: ***Mark Krusemeyer***
Web & Subscriptions: ***Sue Jandro***