



# Goodsell Gazette

Carleton College

Northfield, MN 55057

The newsletter for the Carleton mathematics and statistics community

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## Mathematics and Statistics Colloquium

The Math/Stats Colloquium Series will be held on Tuesday, October 5, from 4:00 pm --- 5:00 pm in CMC 306. We are pleased to welcome Dr. John Zobitz.

**Title:** Mathematical models from soil to satellite: Fulbright adventures in Finland

**Speaker:** Dr. John Zobitz (Augsburg University)

**Abstract:** The Fulbright program supports students and faculty to engage in international exchanges and scholarship abroad. Last year I was fortunate to travel abroad with my family (even during a pandemic!) to Finland on a project that developed mathematical models for soil carbon following forest fires. This project involved an interesting mix of mathematics, data science, and some extra persistence and perseverance. This talk will describe some of the lessons learned from Finland, describe the project results, and provide perspectives on how ecological data informs mathematical models.



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## Ice Cream Social

Come one, come all to the Department of Mathematics and Statistics Ice Cream Social on Monday, September 27 at 4:15pm, just outside the CMC on the Boliou Terrace. Help us celebrate the beginning of a new year by eating ice cream treats from DQ! Bring your friends! We hope to see you there.

(Note: rescheduled from Friday the 24th due to weather.)

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## Want to give a talk at a math conference?

The Mathematical Association of America has 29 different regional "sections," and we live in the North Central Section. The NCS has two meetings each year, one in the fall and one in the spring. This fall's meeting is virtual, and the executive committee of the NCS wants to encourage students to present talks at the meeting. (Students are always welcome to present talks, but they're doing a special push this fall

because it's virtual, so they're hoping to get more students.). The talks can be 5, 10, or 20 minutes in length. If you did some math/stats research or a math/stats-related internship over the summer, this would be a great opportunity to talk about it.

See more information at the [section website](#). Submissions are due by Wednesday, September 29.

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## **Registration Open for 2021 Undergraduate Research and Internship Symposium**

Registration for the 2021 Undergraduate Research and Internship Symposium is now open! You can find a link to the registration form on the 2021 Symposium [web page](#). You will see that we have shifted the registration deadline: students are encouraged to register by September 24, 2021, but the final registration deadline is October 1, 2021.

Doug Foxgrover and Matt Whited have made a helpful [video](#) on how to prepare and present an effective poster. In addition, students can visit the Quantitative Resource Center (QRC) for help designing graphics or writing up quantitative results. QRC tutors can help with basic quantitative communication, and the QRC staff also includes senior Statistics students who are dedicated to consulting on comps and other research projects, including summer research. The QRC will have regular hours Sunday through Thursday, which will soon be posted on the QRC [website](#).

We continue to look forward to learning more about students' research and internship experiences this summer. Please direct any questions to Danette DeMann ([ddemann@carleton.edu](mailto:ddemann@carleton.edu)) or Eric Egge ([eegge@carleton.edu](mailto:eegge@carleton.edu)).

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## **NUMS 2021**

This year's Northfield Undergraduate Mathematics Symposium (NUMS for short, a joint event with St. Olaf) will be held virtually on October 26, and we're looking for speakers! If you did some math or stats research this summer and are interested in giving a 20-minute talk at NUMS, then please fill out our application form at [forms.gle/vLm41JdGm19ysLk86](https://forms.gle/vLm41JdGm19ysLk86). You can see examples of previous NUMS talks at [carleton.edu/math/how-to-get-involved/nums/](https://carleton.edu/math/how-to-get-involved/nums/).

The deadline for submitting an application is October 5 at 5pm. Please contact Caroline Turnage-Butterbaugh ([cturnageb@carleton.edu](mailto:cturnageb@carleton.edu)) if you have any questions.

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## **A Message from GeMMS**

Welcome to fall term! We hope everyone's first day of classes is going wonderfully. We are GeMMS: Gender Minorities in Mathematics and Statistics. GeMMS is a space where those who identify as a gender minority in the math/stats community, as well as allies, can come together to have fun, share experiences, and engage in community with one another. Anyone is welcome to join our email list, though

some events will be specifically aimed at those who identify as a gender minority. Join our mailing list [HERE!](#)

This term we plan to have a Mentor/Mentee Program, in which we pair first- and second-year students with a third- or fourth-year student within GeMMS. This is a great way to get to know other students in the department, give and receive advice, and make friends! Sign up [HERE](#). This program is aimed at those who identify as a gender minority.

We will also host Crafts and Conversations events, as well as workshops on REU and grad school applications -- stay tuned for more info and sign up for our email list [HERE!](#)

If you have any questions please contact MurphyKate Montee (mmontee@) or any member of our board: Michaela Polley (polleym@), Isaac Fried (frieds@), Mika Cooney (cooneym2@), Antonia Ritter (rittera@), or Sabrina Shanaa (shanaas@).

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## **Congratulations Carleton Students for Outstanding Paper!**

Collin Smith '22 and Horace Fusco '23 received an Outstanding Student Paper Session Presentation Award at MAA MathFest in August 2021 for their presentation titled "The importance of being discrete: dynamics of flow-kick disturbance models." This talk highlighted their results from eight weeks of summer research with math professor Kate Meyer. Congrats, Horace and Collin!

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## **Prof. Deanna Haunsperger Launches Podcast**

Join Della Dumbaugh and Deanna Haunsperger this fall for conversations with colleagues in the mathematical community. Listen to delightful mathematicians with fascinating stories about family and home. These conversations will give you insights into the many paths people take to find their way to a career in mathematics and the many people who help them along the way. You can listen to colleagues talk about moments when they felt like they were part of a community—and moments when they felt like they were outside the community looking in. You will laugh out loud when you hear the funny items colleagues keep on their desks and warm your heart when you learn the sounds that remind them of home.

You can find **Count Me In with Della and Deanna** on the MAA's blog site Math Values, or on Spotify or Apple Podcasts.

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## **Lending Library**

We are happy to announce that we have started a lending library this year. If the price of your textbook is an obstacle for you, there are a number of campus resources to support you including a small [CSA](#) lending library and the [Dean of Students Office](#). TRIO students can use the [TRIO](#) lending

library. If you've exhausted these resources, and are not a TRIO student, then you can make use of the Math/Stat department lending library. We have a limited number of textbooks to lend out for Stat 120, and Math 111, 120, 210, 211, 232 and 236. Contact Sue Jandro (sjandro@carleton.edu) in the Department of Mathematics and Statistics to reserve a book for the term.

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## **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 4:00 to 5:00 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.

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## **Putnam Signup Time is Here!**

Fall term is just getting underway, but it's already time to sign up for this year's William Lowell Putnam Mathematical Competition. As many of you know, the "Putnam" is the most famous 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. So if you get one of the twelve problems right, you're doing great!

Whether you've participated in the contest 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 4:00 to 5:00 in CMC 328.

This year the Putnam will be held on Saturday, December 4. 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 at rfjones@carleton.edu. Please sign up by Friday, October 15.

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## **Seeking Volunteer Tutors to Help Children Impacted by School Closures**

On Wednesday March 11, 2020 officials across the United States announced that 55 million US school children would be out of school starting Monday, with no definitive plan in place for their remote education or childcare. While learning loss has been significant everywhere, Black and Latino students have been the hardest hit and the last communities to return to in-person school, exacerbating existing inequity and racial disparities in learning and achievement. The pandemic also impacted student's mental health, leading to higher rates of addiction, depression and anxiety in our youth.

Masteryhour.org is a free, online math tutoring project formed in November 2020 by a group of volunteer educators, math professors and college students. As students return to in-person school, the need for high quality tutoring is greater than ever. We urgently need more volunteer tutors to meet the growing demand for tutoring and ensure 1-1 student/teacher ratio in our sessions.

We are looking for caring, energized college students to complete our three hour training program and commit to volunteer one hour a week for a semester to support students with homework and learning apps. No previous tutoring experience is required - just a love of kids and passion for education! We provide an excellent training program, shadowing experience and are here to support our tutors every step of the way. We've found that just the opportunity to work with a positive, caring mentor can make a world of difference in a student's education and their life.

In addition to the many moral and spiritual benefits of community service, we also write excellent letters of recommendation for our active tutors and support our volunteer tutors as much as we can in realizing whatever dreams they hold for the future, whether that's becoming a teacher or another career/life aspiration.

Interested tutors can learn more or apply to tutor at [masteryhour.org/tutor](https://masteryhour.org/tutor). Please feel free to direct any questions to [manisha@masteryhour.org](mailto:manisha@masteryhour.org).

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## **Upcoming Events**

### **Week 3**

Monday September 27, 4:15pm  
Ice Cream Social — Boliou Terrace

### **Week 4**

Tuesday October 5, 4:00-5:00pm  
John Zobitz Colloquium Talk — CMC 306

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## Problems of the Fortnight

Welcome to Carleton, or welcome back for a new academic year! If things go according to plan, there will be, as in the past, two problems in each “regular” issue of the *Gazette*. Correct solutions are eligible for prizes from the B.B.O.P. (not a musical genre, but the Big Box Of Prizes, which resides in the CMC). Solutions can be submitted either in hard copy (to my box on the second floor of the CMC) or by e-mail to me at mkruseme@carleton.edu . If you use e-mail, you can either include the solution in the body of the e-mail, or attach a pdf (no other attachments, please) so you can handwrite the solution and/or include formulas, graphs, etc., easily. Still if you use e-mail, please include “Problems of the Fortnight Solution” or something similar in the subject line, so it doesn’t get lost in a stack of unrelated messages. Solutions are “due” by noon on Tuesday of the next *Gazette* week - in this case, by noon on Tuesday, October 5. (Solutions that come in later will still be considered, but I probably won’t be able to acknowledge them in that Friday’s *Gazette*.) People submitting incorrect solutions will not be identified in public (but should receive supportive comments in private), so don’t hesitate to submit something even if you’re not sure whether it’s right. (On the other hand, to be eligible for a prize, a solution should show reasoning, not just an answer.) By the way, the problems are not necessarily in order of difficulty for you - for one thing, their difficulty may depend on what you happen to have seen!

Here are the first two problems of the term:

1. a) Given a triangle  $ABC$  (in the plane), show that there is exactly one triangle  $PQR$  such that  $A$  is the midpoint of  $PQ$ ,  $B$  is the midpoint of  $QR$ , and  $C$  is the midpoint of  $RP$ .  
b) Now suppose we have, instead, a quadrilateral (four-sided polygon)  $ABCD$ . Under what conditions (if any) does there exist a quadrilateral  $PQRS$  such that  $A$  is the midpoint of  $PQ$ ,  $B$  is the midpoint of  $QR$ ,  $C$  is the midpoint of  $RS$ , and  $D$  is the midpoint of  $SP$ ? If such a quadrilateral  $PQRS$  exists, is it unique?
2. Suppose you have two identical machines and  $n$  tasks, each of which is to be done by either of the two machines, such that the  $k$ -th task takes  $k^2$  minutes.
  - a) For what values of  $n$  can the tasks be distributed between the two machines in such a way that the two machines both start together and also end the last two tasks together?
  - b) For the other values of  $n$ , if the machines start together, what is (as a function of  $n$ ) the least possible difference between the times that the machines end the last two tasks? (For example, if  $n = 3$  the tasks take 1, 4 and 9 minutes, so the best you can do is to give one of the machines the longest task and the other machine the two other tasks, and so the least possible difference is  $9 - (1 + 4) = 4$ , whereas it can be checked that for  $n = 5$  the least possible difference is  $(4 + 9 + 16) - (25 + 1) = 3$ .)

Looking forward to getting solutions from both new and veteran problem solvers to the problems above!  
- Mark Krusemeyer



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