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Mathematics & Statistics Comps Talks

Five comps groups who did their work during Fall & Winter Terms are about to put the finishing touches on their presentations. They'll present what they've discovered in Olin 141 beginning either at 3:30 on Tuesday, February 21 or at 3:30 Thursday, February 23. Stop by for a talk or two (or all of them!) and you'll be sure to learn something about fields of mathematics or statistics you've never encountered! And there's an added bonus: since the talks take place in the evening, dinner will be provided for all attendees.

Tuesday, February 21 3:30 - 6:00

Title: The ABCs (and DEFGs) of Classifying Lie Algebras
Speaker: Daniel Lewitz, Sam McHugh, Eric Walker
Time: 3:30 - 4:30

A mathematician on the street walks up to you and hands you a continuous group which is also a smooth differentiable manifold and asks you about the tangent space at the identity. You have no idea what the mathematician is talking about, but after you go to our comps talk, you'll know all about it. In this talk, we'll discuss what a Lie algebra is and briefly go over how Lie algebras connect to Lie groups. The bulk of our talk will use root spaces and Dynkin diagrams to classify finite-dimensional Lie algebras over algebraically closed fields.

Title: When counting primes gets complex Sketch of an analytic proof of the Prime Number Theorem
Speakers: Liyang Liu, Frank Yang
Time: 4:30 - 5:30

What is the probability for a random integer between 1 and N to be a prime? This seemingly naive question has a surprisingly precise answer, which was first conjectured in 1792 when Gauss studied the distribution of primes. It then took around 100 years for a proof of the answer (now known as the Prime Number Theorem) to be found. In this talk, we will sketch an analytic proof of this famous theorem; along the way, you will get a taste of how complex analysis can be used in number theory.

Time: 5:30 - 6:00
Dinner will be provided for all who attend the talks.

Thursday, February 23 3:30 - 7:00

Title: Spatial Statistics
Speaker: Jeremy Pang, Mitchell Biewen, Jonathan Forsander, Junxiong Liu
Time: 3:30 - 4:30

Ever wonder if alien abductions are randomly located or if they occur in a pattern? While we cannot confirm the existence of alien life, we can attempt to figure out whether UFO sightings are randomly located. We will be able to study this question by using techniques obtained using Spatial Statistics. Come learn about this exciting field and the various spatial data questions that are now available to study.

Title: Exploring Discrete Neuronal Network Dynamics: Stability vs. Chaos
Speaker: Maddy Cosgriff, Eli Miller, Sabastian Mugazambi, Patrick O'Reilly
Time: 4:30 - 5:30

The dynamics of discrete networks of excitatory and inhibitory neurons are explored through simulations and graphical representations. Network parameters are investigated to determine which conditions yield the most rich and complex behaviors. Additionally, biological connections are discussed, and logic gates are created from our model.

Time: 5:30
Dinner will be provided for all who attend the talks.

Title: Adventures in Algebra: Developing a Bar Modeling Curriculum
Speaker: Meg Crenshaw, Charlotte Mann, Zoe Peterson, Alli Domingues
Time: 6:00 - 7:00

How would you explain how to solve 2x + 5 = 15? Often students learn a procedure for solving this type of problem without conceptual understanding. There are many alternative methods for teaching algebra that help students gain both procedural and conceptual knowledge. We worked with Dan Meyers, a teacher at Northfield Middle School, to develop an algebra curriculum using bar modeling, a method for visualizing algebraic equations. During our talk, we will explain bar modeling, the development of our workbook, and our experiences working with middle school students. We will also discuss the cognitive and pedagogical theory that support the bar modeling method as well as its limitations.

A Different Kind of Budapest Experience

You may know about the acclaimed Budapest Semesters in Mathematics (BSM) program. But you may not know that there's a new opportunity for students interested in mathematics education. Budapest Semesters in Mathematics Education (BSME) is a semester-long study-abroad program. At BSME, students explore the Hungarian approach to learning and teaching, in which a strong and explicit emphasis is placed on problem solving, mathematical creativity, and communication. BSME welcomes students who are (1) currently pursuing secondary mathematics teaching license, (2) planning to pursue other paths to mathematics licensure, or (3) simply curious about learning and teaching of mathematics. To learn more about BSME, visit the program's website at bsmeducation.com.BSME is currently accepting applications for the Fall 2017 and Spring 2018 semesters. If you're interested in this opportunity, please contact Prof. Ryota Matsuura (matsuura@stolaf.edu), who directs the North American Office of BSME.

Open House with Stephen Abbott

Have you ever wanted to say your piece to Stephen Abbott, the author of the textbook for Real Analysis I, "Understanding Analysis"? Well now's your chance. Come meet him Monday February 20th from 3:10 to 3:30pm in CMC 319. There'll be treats, great conversation and maybe even some impromptu book-signing!!

Konhauser Memorial Problemfest

On Saturday, February 25, the 25th annual Konhauser Memorial Problemfest will happen right here at Carleton! The contest, which is named after the late Macalester professor and legendary problem poser Joe Konhauser, is only hosted at Carleton once every four years. 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. You can see the trophy on the table in the math department atrium -- last year's top Carleton team ensured it would stay here for its third year in a row. It would be great to have it stick around for another year! To sign up for this year's 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.

Job & Internship Opportunities

University of North Carolina Wilmington: REU
Are you interested in research in Statistics? Well, this REU might be just for you! Participants form research teams to learn about statistical mining in computer vision and pattern recognition. The program lasts for ten weeks and projects vary; everything from demographic studies to statisical modeling is included. This program will help students develop data analytical skills in data visualization, dimension reduction, regression and classification and improve effective communication skills. The application deadline is March 31st. For more information visit:

Problems of the Fortnight

This is a special edition of the Gazette, so there are no problems of the week. Take a look at previous issues located near the white board.

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