

# Math



# Mess

Department of Mathematics  
St. Olaf College  
Northfield, MN 55057

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## This Week's Mathematics Colloquiums

Title: Alternating Sign Matrix Conjectures / Knots and Rope

Speakers: Eric Egge / Eric Rawdon

Time: Tuesday, February 11<sup>th</sup>, 1:30 pm / Thursday, February 13<sup>th</sup>, 2:30pm

Place: SC 182

### Tuesday's Colloquium

In a 1991 article in the *Mathematical Intelligencer*, David Robbins made the following proclamation: "These conjectures are of such compelling simplicity that it is hard to understand how any mathematician can bear the pain of living without understanding why they are true." The conjectures Robbins was referring to concern the number of alternating sign matrices of various types. In his talk Dr. Egge will explain what alternating sign matrices are and what the alternating sign matrix conjectures say about them. He will also show us that these matrices have some surprising connections with a model of ordinary ice and a seemingly unrelated set of objects, called totally symmetric self-complimentary plane partitions.

A native of Minnesota, Eric Egge studied Mathematics at Carleton College and the University of Wisconsin-Madison before joining the faculty at Gettysburg College in Gettysburg, Pennsylvania. His mathematical

interests include combinatorics, algebra, and the interface between the two. He also enjoys giving talks on the intriguing mathematics people encounter daily, such as the perils and pitfalls of different election methods, and how mathematics is used to "fix" those nasty scratches people make on CDs and DVDs. In his spare time Eric is an avid reader, sometime runner, basketball player, and stamp collector.

### Thursday's Colloquium

Last night you stuffed your headphones in your jacket pocket. When you pulled them out this morning, it was a tangled mess. Despite desperate efforts to avoid this tragic situation, the knot gnomes have won again. Some knots are easier to tie and, thus, more likely to occur in your headphone cord. This is one of many ways to measure the complexity of a knot. This talk will focus on another, known as the minimum ropelength. Roughly speaking, this is the least amount of rope needed to tie a certain knot. You might say "That is a cute idea, but who cares?" (Continued on next page) Well, it turns out that the

biologists, chemists, and physicists are interested. The ropelength can be used to predict the speed at which knotted DNA moves through gel and to understand why naturally occurring proteins pack as helices.

Dr. Rawdon will introduce some basic knot theory, discuss ropelength, and show some applications. Each participant will receive his or her own KTC (knot theory certified) knot-maker (also known as a piece of rope). This seminar is self-contained: no experience with knots (except tying your shoes) is assumed. If your headphones are still tangled, feel free to bring those along.

Eric Rawdon graduated from St. Olaf College in 1992 with a major in math and concentrations in African Diaspora and ARMS. He received his Ph.D. from the University of Iowa in 1997 in Physical Knot Theory. Eric is currently teaching at Duquesne University in Pittsburgh and moonlighting as a steel worker (ok, just kidding). He enjoys playing golf, brewing beer, jogging, and traveling.

## REU Info and MAA Kick-Off

If "Do you want fries with that?" are in your plans for the summer, come hear about some other options. There are over 50 different opportunities around the country for you to make money doing math research this summer and pad your resume while you're at it. Most of these REU's also pay for travel, lodging, and food and there are programs available for first-years, sophomores, and juniors. Come find out what it's all about while enjoying free PIZZA! We'll also have the kick-off meeting for the student chapter of the MAA after the presentation of the REU information. So come and bring a friend this Tuesday, February 11, 7:00 pm in SC 182.

## Konhauser

The Konhauser Problemfest, in memory of Professor Joe Konhauser from Macalester, is an annual problem solving competition between St. Olaf, Carleton, Macalester, St. Thomas, and

Gustavus Adolphus. The site rotates, and this year it will be at St. Olaf. The contest will take place on Saturday, Feb. 22, from 9am to 12noon. Students compete in teams of three. Please contact Molnar if you are interested. Copies of previous problem sets are available at <http://www.macalester.edu/~mathcs/potw.html>

## Mark Your Calendars

Please reserve space in your busy schedules for some of the important math department events this spring. **Pi Day** (3/14) is coming upon us quickly. Although the exact plans for the day are still in the works, it would be irrational not to participate. The **Math Recital** is scheduled for April 16<sup>th</sup> in Ytterboe Lounge. Contact Steve McKelvey ([mckelvey@stolaf.edu](mailto:mckelvey@stolaf.edu)) if you're interested in performing. This year the **Mother's Day Pig Roast** will proceed without the guidance and analytic ability of Paul Humke, who is on sabbatical doing research on Lebesgue's techniques of pig roasting. So we really need students to help organize and barbecue. Email Doreen Hamilton ([hamiltod@stolaf.edu](mailto:hamiltod@stolaf.edu)) if you're willing to lend us your pig roasting skills.

## Problem of the Week

How many of the numbers in the 2003rd row of Pascal's Triangle are odd? Consider the 2003rd row to be the one which starts 1, 2003, ....

\*\* Please submit all solutions to David Molnar ([molnar@stolaf.edu](mailto:molnar@stolaf.edu)) by noon on Sunday.

If you would like to receive a copy of the Math Mess in your P.O. Box weekly, please e-mail Donna Brakke at [brakke@stolaf.edu](mailto:brakke@stolaf.edu).

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