

# MSCS



# Mess

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## This week's Colloquium

Title:	Being a Health Actuary: Cool Models, Cool Career
Speaker:	Andie Bykerk Christopherson
Time:	1:30 pm Tuesday, December 4th
Place:	SC 182

**Abstract:** Andie will discuss the actuarial modeling challenge of understanding and analyzing the impact of calendar patterns and content on expected health care claims costs, as well as the trend patterns these values produce. She will also discuss skills most important to being a successful actuary and a little about the preliminary exam and education requirements.

**Bio:** Andie Bykerk Christopherson, FSA, MAAA is a consulting actuary at Reden & Anders, focused on health care trend analytics. An '02 Ole grad with a mathematics major and statistics concentration, she finished her actuarial exams this fall, becoming a Fellow in the Society of Actuaries. She resides in the Twin Cities, and has been very involved with the recruitment of new students into the actuarial field, focused especially on making candidates with broad backgrounds aware of the possibilities the field has to offer.

Andie will be available following the colloquium to meet with any students who are interested in actuarial work and internship opportunities.

Please stop by the CIR office (SC 170) if you would like to chat with Andie.

## MSCS and Counterterrorism

As warfare changed, new mathematics was developed to solve problems that arose. Counterterrorism, a major focus of current military operations, provides many mathematical challenges. Mathematical and computational techniques are being applied to problems including border penetration and security, terrorist cell formation and growth, terrorism deterrence strategies, information security, and emergency response and planning. For example, lattices (ordered graphs) are used to model terrorist cells. By analyzing the structure of the cell, it may be possible to determine the most practical way to disrupt the cell's operation. If the structure of a cell is unknown, mathematical and statistical techniques can be used to comb through databases looking for connections between individuals, locations or events. Researchers interested in these problems gathered recently at the fourth conference on Mathematical Methods in Counterterrorism, held September 20-22, 2007 in Rochester, New York. The website for the conference <http://www.rit.edu/~cmmc/conferences/2007/> contains abstracts of the talks presented.

## Student Challenge: MAA's MathTube Contest

Robert Vallin wants everybody to know that mathematics is fun. In fact, he'd like undergraduate students to capture the fun of math on video so that he can prove it to everyone. And he wants to pay students to do so.

With this in mind, the MAA is introducing its first-ever [MathTube Contest](#). The contest, open to teams of up to three undergraduate students, calls for creative videos that show the entertaining side of mathematics in a style similar to that of other such videos found on the popular website [YouTube](#).

"I want people to put tongue firmly in cheek and show us what they've got," said Vallin, MAA's Associate Director for Student Activities. One of Vallin's favorite math-related YouTube videos, the popular [Finite Simple Group \(of Order Two\) video](#) by The Klein Four Group, serves as a great example of the kind of creativity the panel of MAA judges will be looking for.

As a reward, each member of the creative team of the winning video will receive \$100, complimentary registration for the [Joint Mathematics Meetings](#) in San Diego, and a collection of MAA products, including a flying disc, a deck of cards, a travel mug, and a stress-relieving icosahedron. The next three runners-up will receive the pack of MAA goodies for each member of the creative team and a \$25 gift certificate for MAA products. Vallin would also like to show the winning entries at one of the MAA booths at the JMM in San Diego this January.

The entry deadline for the MAA MathTube Contest is December 15th at 11:00 p.m. Vallin emphasizes that all participants should look carefully at the [rules and regulations](#) of the

contest and make sure that they sign the consent form that must accompany all entries. Any further questions about the MAA MathTube Contest should be directed to Vallin, at [rvallin@maa.org](mailto:rvallin@maa.org).—*R. Miller*

## St. Olaf students to present research at World Health Organization

Full text by Lyndel Owens '10

(<http://fusion.stolaf.edu/news/index.cfm?fuseaction=NewsDetails&id=4109>)

Three St. Olaf College students will present their research on foodborne disease to experts at the [World Health Organization](#) (WHO) in Geneva.

From  
Saturday,  
Nov. 24,  
through  
Thursday,  
Nov. 29,  
**Sommer  
Wild** '09,  
**Brianna  
Hirst** '08 and



**Laura Boehm** '08 will present their research to the WHO's Foodborne Disease Burden Epidemiology Reference Group (FERG).

Last January the trio began researching the mortality rates of foodborne disease in various nations for their project on the Global Health and Biostatistics Interim course with Professor of Statistics Julie Legler. Legler believes the students' findings will clarify problems in foodborne disease analysis and is an "important project for helping to allocate precious global health dollars."

## TEACH FOR solving our nation's greatest injustice.

Teach For America often reaches out to highly accomplished individuals like you, particularly those who have studied math and science.

Did you know that students in urban secondary schools have less than a 50% chance of getting a math or science teacher who has at least a minor in that subject? This fact likely contributes to the following startling statistics:

- In the 4<sup>th</sup> grade, low-income students are 3 times less likely than high-income students to perform at or above a 'basic' level in mathematics.
- In the 8<sup>th</sup> grade, 49% of low-income students were performing at a below basic level in mathematics.
- In the 12<sup>th</sup> grade, only 6% of African American students and 8% of Hispanic students perform at or 'proficient' in mathematics, compared to 29% of white students.

There is a growing need for professionals in the science and mathematics fields, and yet our public schools, especially those in low-income communities, are failing to adequately prepare enough students for these careers. Through Teach For America, science and mathematics majors can help expand and diversify the pipeline of future scientists and mathematicians by providing more students in urban and rural public schools with the skills they need to be successful.

You are uniquely positioned to make a significant impact on your students' understanding of science and mathematics, and to inspire them to pursue a career in one of those fields. At the same time, you'll gain valuable insight into this issue by working with students and families and seeing from the inside how the system is set up-or not-to meet their needs. Many alumni in the science and mathematics fields tell us that spending two years teaching profoundly impacted their thinking and

the skill set that they brought with them into their graduate studies.

Next application deadline for the 2008 corps: Jan. 4, 2008.

Visit [www.teachforamerica.org](http://www.teachforamerica.org) or contact the Campus Campaign Coordinator, Meggie Wade, at [wade@stolaf.edu](mailto:wade@stolaf.edu) for more information.

One day, all children in this nation will have the opportunity to attain an excellent education.

## Congratulations!

To **Nicole Novak**, a statistics concentrator, who received a Rhodes Scholarship

## MAA - North Central Section Team Contest Results

St. Olaf's top team of **Thomas McConville**, **Matt Deram** and **Nathan Clement** placed 5th in the 2007 MAA-NCS Team Contest. 53 teams from 25 colleges and universities in Minnesota, the Dakotas, Manitoba and western Ontario competed. St. Olaf's other two teams (**Megan Ehresmann**, **Karin Gilje** and **Dan Mork/Mckenzie West**, **Emily Jones** and **Lucas Antony**) placed 19th and 21st, each placing ahead of the top team from 14 other colleges.

## Game Night of the Month NOVEMBER

### "Crosscram" Tournament Results

**Emily Jones** 4-2 (wins tiebreaker)

**Thomas McConville** 4-2

**Ben Wooten** 2-4

**Prof. Weimer.** 2-4

## Game Night: Hawai'ian Style

### Wed. Dec. 5 - 6:30 p.m. - SC188

The game of the month for December is "Konane". It is a traditional Hawai'ian game similar to checkers. In addition to the game, there will also be Hawai'ian pizza, Hawai'ian Punch, Don Ho music and perhaps a pineapple or two. If you Google "Konane", the first five links give the historical and cultural background of the game, plus the rules and a computer opponent to play against.

## Problem of the Week (POW)

### Solution to Nov. 16<sup>th</sup> POW

(The problem originally appeared in the 2002 William Lowell Putnam Exam)

### Original Question

Shanille O'Keal shoots free throws. She makes the first, misses the second, and thereafter the probability that she makes the next shot is equal to the proportion of shots she has hit so far. What is the probability that she hits exactly 50 of her first 100 shots?

### Weimer's

The problem is equivalent to the following: A town has streets numbered First through 100th beginning in the south, and avenues numbered First through 100th beginning in the west. Start at the intersection of First Street and First Avenue and randomly determine whether to walk north or east as follows: If you are at the intersection of 'j' Street and 'k' Avenue, go north with probability  $j/(j+k)$ . The probability that we are looking for is the probability of arriving at 50th Street and 50th Avenue.

### Solution

There are  $\binom{98}{49}$  paths leading to the desired location. Each path has the same probability  $\frac{(49!)^2}{99!}$  thus the total probability is  $\binom{98}{49} \frac{(49!)^2}{99!} = \frac{1}{99}$

## Joke of the Week

A math student is pestered by a classmate who wants to copy his homework assignment. The student hesitates, not only because he thinks it's wrong, but also because he doesn't want to be sanctioned for aiding and abetting. His classmate calms him down: "Nobody will be able to trace my homework to you: I'll be changing the names of all the constants and variables:  $a$  to  $b$ ,  $x$  to  $y$ , and so on." Not quite convinced, but eager to be left alone, the student hands his completed assignment to the classmate for copying.

After the deadline, the student asks: "Did you *really* change the names of *all* the variables?" "Sure!" the classmate replies. "When you called a function  $f$ , I called it  $g$ ; when you called a variable  $x$ , I renamed it to  $y$ ; and when you were writing about the log of  $x+1$ , I called it the timber of  $x+1$ ..."

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*If you would like to submit an article or math event to be published in the Math Mess, e-mail tummers@stolaf.edu.*