

Math Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

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This Week's Mathematics Colloquium

Title: Markov Chains

Speaker: Ted Vessey

Time: Tuesday, September 10th, 1:30 pm

Place: SC 182

Welcome (Back)

Welcome to the first issue of the Math Mess for the academic year '02-'03! For those of you new to the Math Mess (MM), this is a weekly departmental newsletter devoted to information of interest to math, CS, and stats folks. We give details on the week's colloquium speaker, departmental announcements and activities, opportunities for students, the problem of the week, and many other scintillating tidbits.

This Week's Colloquium

Note the new time and day: Tuesdays at 1:30. This year we kick things off with our very own Ted Vessey who is returning after a year and half leave. During this time Ted visited Turkey, was named a distinguished college teacher of mathematics by the MAA, spent a semester at UMass-Amherst, and two and a half months as a visiting scholar at

Chiang Mai University in Thailand. Although his training and most of his research is in analysis, Ted's mathematical avocation is probabilistic models, and he came to this area through his fascination with Markov chains.

Ted will take a look at a family of mathematical models of probabilistic phenomena. Using just a little linear algebra and a smattering of probability he will show us how Markov chains can be used to model such diverse phenomena as weather, cancer survival, gambling systems, and truels (3-person duels).

New Student Lounge

OMH 200 is sporting a makeover! Thanks to the Target Corporation, the once modest OMH 200 has been elegantly refurnished and is now ready for action (or inaction, as the case may be for weary

students.) Come look at the new décor, and stay for an intimate mathematical conversation with your classmates.

MAA Kicks Off

The MAA begins the 2002-03 school year by adhering to that famous math department dictum: "Bring food, and they will come." Cake from Bon Appetite will be the food of choice during the MAA's meeting at 7:00 on Thursday, September 12th, in SC 182. This meeting is open to anyone with an interest in math-related social events, undergraduate research conferences, or t-shirt sales. The main items on the agenda include a discussion about MAA's purpose on campus, and a brainstorming session about possible activities for the upcoming year. Officers will also be elected. Of course, corny math humor will be interjected into the proceedings from time to time. Come one, come n, come all!

Doreen Dumonceau Hamilton presides as the MAA faculty advisor for the 2002-03 school year.

2002 Fields Medals Winners

On August 20th in Beijing, the International Mathematical Union presented the 2002 Fields Medals. These awards are quite aptly nicknamed the "Nobel Prize for Mathematics," as they are given to the brightest young minds (usually <40 years old) in the field of mathematics. The two winners this year were Laurent Lafforgue of the Institut des Hautes Études Scientifiques in Bures-sur-Yvette, and Vladimir Voevodsky of Institute for Advanced Study in Princeton, NJ. Lafforgue distinguished himself by furthering the ideas of Robert Langlands, who sought to uncover fundamental connections between number theory, analysis, and group representation theory. Voevodsky was honored for his new cohomology theory for algebraic varieties. The theory ties algebra K-theory with algebraic varieties, and as a consequence proves the Milnor Conjecture, the main open question in algebraic K-theory for many years.

Problem of the Week

Imagine a giant Spirograph ring with 2002 teeth on its inner edge. You have five different wheels, with 868, 755, 714, 660, and 616 teeth, respectively. (Although that last one could change.) You take the first wheel and put it inside the ring. Your pen can poke through the wheel at any point, since it is imaginary anyway. The wheel rotates inside the ring, and if you keep going without gears slipping until the pen reaches its starting point {headed in its original direction} you get a flower-like design. The number of "petals" on such a flower is the number of times the pen reaches its closest distance to the ring. For example, a wheel with 60 teeth inside a ring with 105 teeth on its inner edge makes a flower with seven petals, no matter where you put the pen. After having done this with each of the five wheels one at a time, you find that two produce flowers with the same number of petals. Which two? (You do not need to use an actual Spirograph to solve this problem, but if you want to anyway, there are some to play with in the MATH STUDENT LOUNGE in OMH 200.)

BONUS PROBLEM:

Also in the Student Lounge is a Homer Simpson's Head version of Rubik's cube. This is a 2x2x2 cube. The packaging claimed that there are billions of arrangements of the eight pieces. Is this true? How many arrangements are there?

** Please submit all solutions to David Molnar (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.

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