

*Mark your calendar. . .*

## Mathematics Colloquia Spring 2005

Mathematics colloquium talks are Wednesdays 3:40-4:40 p.m. in Science 108. Refreshments are provided.

Jan. 26	Dr. Nicholas Coult, Augsburg College
Feb. 9	<b>Dr. Terrance Hurley, Dept. of Applied Economics, University of Minnesota</b>
Feb. 23	TBD
Mar. 9	Dr. Suzanne Dorée, Augsburg College
Apr. 6	TBD
Apr. 13	TBD
Apr. 27	TBD

## Applied Economics at the University of Minnesota

**Dr. Terrance Hurley,**  
**Dept. Of Applied Economics**  
**University of Minnesota**

The Applied Economics Department offer programs of study in food marketing and consumption economics; economic development, trade and policy; production and managerial economics; resource and environmental economics; public sector economics;

and agribusiness management. Professor Hurley's primary research interests include the analysis of emerging technologies such as genetically engineered herbicide tolerant and pesticidal crops and information intensive farm management. Additional interests include the analysis of regulatory conflict under asymmetric information and the increasing importance of hired farm labor.

## Solve this week's puzzle & get a free piece of dark chocolate\*

\* while supplies last.



### Puzzle 6, Problem 6: Dark Chocolate

For Valentine's Day, a candy manufacturer wants to offer a box of 64 chocolates with 8 horizontal and 8 vertical rows. There are two types of chocolates, milk chocolate and dark chocolate. The manufacturer wants to have at least one dark chocolate in every vertical row, in every horizontal row, *and every diagonal* (not just the main diagonals, but all the littler ones as well).

What is the smallest number of dark chocolates needed?

What if you have an  $n \times n$  box instead of an  $8 \times 8$  box?

Send your solutions (not just answers, please) to the editors at [haines@augsborg.edu](mailto:haines@augsborg.edu) or drop them in the "Puzzles & Problems" box in the Mathematics Department Suite, Science 137. Getting the Augarithms after we've published the answers? The puzzles are available at publication date on the web. [As usual, this puzzle is not our invention. The credit will appear with solvers list.]



*Augarithms* is available on-line at [augsborg.edu/math/augarithms/](http://augsborg.edu/math/augarithms/). Click on the date you want to see.

### *Augarithms*

*The Bi-weekly Newsletter of  
the Department of  
Mathematics at Augsburg College*

2211 Riverside Avenue  
Minneapolis, MN 55454

Editors.....Su Dorée, Matt Haines  
e-mail address.....[doree@augsborg.edu](mailto:doree@augsborg.edu)  
.....[haines@augsborg.edu](mailto:haines@augsborg.edu)

## Animation by Mathematics

Interested in a career that combines mathematics, computer science, fine art, classical animation, physics, biomechanics, and anatomy? Consider computer animation. Algorithms used combine techniques from scientific computation, statistics, signal processing, linear algebra, control theory, and computational geometry.\*

Learn more about the mathematics behind animation at an upcoming IMA public lecture by David Baraff: *Math Behind the Curtains: Dynamic Simulation at Pixar Animation Studios*

7:00 p.m Wed Feb 9, 2005  
Smitth Hall 100  
207 Pleasant Street SE  
University of Minnesota

\* Description adapted from "Going Somewhere? Careers in Applied Mathematics" by SIAM

## Coult Makes Waves at Conference

Prof. Nick Coult's recent talk "A Walk on the Industry Side: A Mathematician Takes on the Seismic Exploration Business," was selected as one of the "Highlights of the 2005 Joint Mathematics Meetings" by the American Mathematical Society. AMS-AAAS Mass Media Fellow and reviewer Lisa DeKeukelaere, writes,

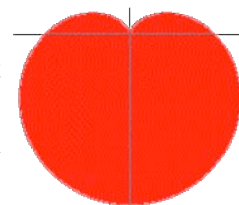
"Seismic exploration is a multi-billion dollar industry whose main activity is searching for oil and gas beneath the earth's surface, and Nicholas Coult has put his math skills to work in helping the industry achieve its goals. In order to locate oil, machines make sound waves that propagate into the crust, then sensors measure the reflections of the waves, and computer programs construct images of the ground beneath our feet. These tests generate large amounts of data, making compression an important problem. Discrete multiwavelet transforms provide a good way to perform the compression, however this method works best for smooth continuously defined data, which is not always available.□To overcome this problem, Nicholas Coult developed an algorithm for eliminating missing data regions by extrapolating the data. Coult noted that problems presented in industry are often a unique challenge because they are not fully specified, and boundaries and special conditions consume much of the work time. In the end, he found educating and communicating with the client to be among the most important keys to success."

<http://www.ams.org/ams/jmm2005-highlights.html>

### Math from the Heart

Take two circles – one fixed and the other turning around it with a pen at one point on the rotating circle. The shape traced is heart-like. The name of the curve is a cardioid – based off the Greek word for heart. In polar coordinates, the equation  $r = a(1 \pm \cos \theta)$  describes a cardioid.

For more information see <http://mathworld.wolfram.com/Cardioid.html>



## NUMB3RS

The new CBS crime drama NUMB3RS hit it big with mathematicians. At the Joint Mathematics Meetings in Atlanta this past January, the pilot was shown several times before its first airing in a few of the hotels. Read what some mathematicians say about the mathematics in the shows at <http://www.maa.org/> and look at the column *Devlin's Angle*: "NUMB3RS gets the math right" by Keith Devlin and *Math Games* "The NUMB3RS TV show" by Ed Pegg, Jr.

## Math History Contest

All undergraduate students are invited to participate in the second annual student paper contest in the history of mathematics sponsored by the History of Mathematics Special Interest Group of the MAA. Deadline March 31, 2005. For more information see

<http://home.adelphi.edu/~bradley/HOMSIG>  
MAA/Student\_contest05.pdf