

# Augarithms



vol. 21.05

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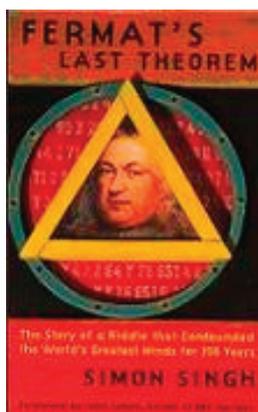
November 28—December 5, 2007

## Mathematics Colloquium Fall Lineup

Colloquia are typically held Wednesdays 3:40—4:40 in Oren 114. Refreshments are always provided.

Sep. 19	Getting acquainted
Sep. 26	Kenneth Kaminsky, Augsburg College
Oct. 10	John Zobitz, Augsburg College
Oct. 24	James Hodges, University of Minnesota
Nov. 7	Fred Hulting, General Mills
Nov. → 28	Fermat's Last Theorem—Nova Special <sup>1</sup>
Dec. 5	Urmila Malvadkar, St. Olaf College <sup>2</sup>

## <sup>1</sup>This week's colloquium: Fermat's Last Theorem—The Nova Special



(From the liner notes of Simon Singh's book *Fermat's Enigma*, recounting the lifelong passion of mathematician Andrew Wiles to prove the theorem that had eluded proof for more than 350 years.)

"I HAVE DISCOVERED A TRULY MARVELLOUS PROOF, WHICH THIS MARGIN IS TOO NARROW TO CONTAIN..." With these tantalizing words the seventeenth-century

French mathematician Pierre de Fermat threw down the gauntlet to future generations. Fermat's last theorem looked simple enough for a child to solve, yet the finest mathematical minds would be baffled by the search for the proof."



Andrew Wiles

Everyone should read Singh's book, but failing that, come to this week's colloquium and view the NOVA special (directed by Singh) retelling Wiles's successful quest.

In the meanwhile, to whet your appetite, you can read an interview with Wiles at <http://www.pbs.org/wgbh/nova/proof/wiles.html>.

## <sup>2</sup>Next week's colloquium

### Urmila Malvadkar—

St. Olaf College

*Using differential equations to bridge the divide between conservation and economics*



Conservation of natural resources is often framed in terms of achieving two conflicting goals—ecological and economic. Here I will show how we

can use mathematical models to analyze these two important goals with respect to marine protected areas—areas of the ocean that are off-limits to fishing. First, I'll derive a partial differential equation that reflects a species that moves in space and is harvested in one region. The solutions to this model can give us an optimal size of marine habitat to protect, if our goals are 1) to protect the species or 2) maximize catch. We can also interpret the solutions to infer what kinds of species are most likely to be protected.

## Augarithms

The bi-weekly newsletter of the  
Department of Mathematics  
at Augsburg College  
Editor.....Kenneth Kaminsky  
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## Problem of the week...

The 'garden walk' problem of vol 21.04 was solved by **Micheal Janas**. He found that the point where you end up the walk has coordinates  $(1/5, 2/5)$ , assuming that the length of  $AB$  is 1.

This week's POTW was presented without solution by Will Shortz on NPR's Weekend Edition. Each square of a four by four checkerboard is to be labeled with a zero or a one in such a way that the sum of the entries in the neighborhood of each square is always odd -- the neighborhood being the squares immediately adjacent (up, down, right, left, and diagonally) together with the square itself. Come up with as many ways of

<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>
<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>
<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>

doing this as possible, or show that it can never be done. For example, the checkerboard on the left fails to satisfy the condition since the square in the top left corner has a neighborhood sum of 2.

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## Puzzle of the week...

There have been no solvers of the puzzle of the week of vol 20.4. We'll wait.

Examine the following sequences of numbers:

1  
11  
21  
1211  
111221  
312211  
13112221  
1113213211  
31131211131221  
13211311123113112211

Although the sequences may appear to be random, in fact, after the first sequence, each sequence is constructed in a precise and methodical way based on the previous one.

What is the next sequence?

Submit solutions to kaminsky@augsborg.edu, or under Ken Kaminsky's door at SCI 137E, or in the puzzles and problems box just outside of Su's office.

## On this Day...

**November 28th**

**1660**—After attending a lecture by Christopher Wren, a group gathered to discuss the founding of "a college for the promoting of physico-mathematical experimental learning." The result was the Royal Society of London.

**1977**—Charles Babbage Institute incorporated.

**1984**—From Karen E. Oleson's bulletin board: (Meal)-squared + pi = 4U2B Thankful.

"Convergence" is edited by Victor Katz of the Mathematical Association of America.

## From the desk of John Zobitz

My brother (Frank Zobitz) is a science teacher at a middle school in White Bear Lake. January 31, 2008 is the annual Science Fair. At this event, all middle school students (102 of them) need to setup a display and talk about the experiment or invention which they are quickly becoming an "expert" on.

Frank is looking for approximate 20 judges to help evaluate their work that evening. Judges would need to be at the school at 5:30, and can leave once they are finished. If you are able to help me out by being a judge, he would really appreciate it. Just simply send Frank an email (frank.zobitz@comcast.net) and he will be in touch after the first of the year with more information. Additional questions can be directed to John Zobitz (zobitz@augsborg.edu).

## Cartoon Corner

