

Math



Mess

Department of Mathematics
St. Olaf College
Northfield, MN 55057

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This Week's Mathematics Colloquium

Title: Data Exploration Tools for the Gene Ontology Database

Speaker: Elizabeth Shoop

Time: Tuesday, March 18, 1:30 pm

Place: SC 182

This Week's Colloquium

Biologists have amassed a tremendously large amount of information about the genes of an amazing number of organisms. In an effort to make sense of all this data, they are developing methods to categorize genes by what they do and where they are located. One of the databases that holds this information is called Gene Ontology, or GO. The GO database is huge, and it is very hard for users to make inquiries to get information from it. In particular, biologists would like to use GO to answer the central question: "What differentiates one organism from another?" To help biologists find their way through this mountain of data and determine the differences between organisms, the speaker has built software tools that enable them to find genes and to visualize what functions they perform. One tool, called GoGet, is a dynamic web application, and another, called GoView, is a Java application that enables users to navigate through a graphical display of the gene categories. Professor Shoop will describe the

GO data, then explain what these two tools do and how she and her students built them.

Libby Shoop is from the Twin Cities, with a Northfield connection: her father worked at another small private liberal arts college here in town. She earned her Ph.D. in Computer Science from the University of Minnesota in the area of databases, then worked in the Center for Computational Genomics and Bioinformatics at the U before joining Macalester. Professionally, she is most interested in finding ways to use and extend database technology for scientific problems, particularly bioinformatics. Personally, Libby's an avid sports fan and outdoor enthusiast (think camping, hiking, roller blading, softball...), and lists drinking coffee and attending the Minnesota Lynx WNBA basketball games as her "most prominent addictions."

CS Haiku of the Week

homework dot interp
submit to kindly graders
cc to my heart

A Warm Welcome

The St. Olaf math community welcomes **Paul Roback** and **Amelia Taylor**! They are the new tenure-track hires who will start teaching at St. Olaf in the fall of 2003. In this and the following issue the Math Mess brings you two short bios to help you get acquainted with the new faculty.

Paul Roback is currently an assistant professor at Connecticut College. After graduating from St. Olaf, Paul earned an MS from Iowa State and a PhD in Statistics from Colorado State. In between, Paul worked for three years as a clinical statistician at Eli Lilly. His academic interests include Bayesian statistics, computer-intensive methods, and ecological applications, and his personal interests include almost any sport. Stay tuned for details on **Amelia Taylor** in the next issue.

Pi Throwing Was a Smash!

On Pi day **Professors Molnar, Richey, McKelvey, Zorn, and Doreen Hamilton** were smacked with piles of whipped cream. 11 cans of whipped topping, 1 bottle of chocolate syrup, 1 box of sprinkles, and a few slices of cheese (for weight) eventually found their way to the professors' faces. Thanks to the professors' willingness to become covered with creamy goo, \$53 was raised for the Northfield foodshelf!

Kay Winger-Blair Research

Are you interested in summer math research at St. Olaf? The Kay Winger-Blair research award can support up to two students for the entire summer. The department often splits this up into smaller awards and has paid students to do 100, 200, or more hours of summer research at \$10/hour. Students should talk to any interested faculty and brainstorm specific projects before applying. Contact **Professor Richey** (richeym@stolaf.edu) for more information.

Math Recital

Remember the math recital is coming up soon: Wednesday, April 16, in Ytterboe lounge at 7:00pm. Plenty of healthy and even more unhealthy food will be served. This is one math department event you can't miss! Contact **Professor McKelvey** (mckelvey@stolaf.edu) for more info or to sign-up for a performance.

Last Week's Problem

Show that $n = 3k^2 - 3k + 1$ for $k=1,2,3,\dots$ are the only values of n for which the formula $w(n) = 3n + \sqrt{12n + 3}$ yields an integer.

The problem was solved by **Jason Saccomano '05**, and **Mark Krusemeyer** from across the river. We need to set the quantity under the square root equal to a perfect square, and see what happens. If $m^2 = 12n + 3$, then $m^2 \equiv 9 \pmod{12}$, from which it follows that $m \equiv 3 \pmod{12}$ or $m \equiv 9 \pmod{12}$.

Thus we can set $m = 6k + 3$, for $k = 1, 2, 3, \dots$. Plugging this into $m^2 = 12n + 3$ and solving for n yields the desired result.

Problem of the Week

The well-intentioned but lazy philatelists of blagojevich produce only two denominations of stamps, a and b . As luck would have it, there are combinations of these two denominations totaling any integer quantity C or greater, but not $C-1$. Is it possible that C is 73?

** 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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