

L'Augarithms*



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September 16, 2009

Mathematics Colloquium FALL Lineup

Colloquia are typically held Wednesdays 3:40—4:40 in Oren 113.

Refreshments will be served.

Sep. →	16	Annual Meet and Greet (the Department, that is) ¹
Sep.	30	Ben Jordan, Harvard University, "The procession of math science and art"
Oct.	21	Al Garver, Augsburg College, "(0, 2) - Graphs and Young Tableaux"
Nov.	4	TBA
Nov.	18	TBA
Dec.	2	TBA

¹Annual Meet and Greet...

In the first of this academic year's colloquium series, you get to know us a little bit better. We (the faculty) introduce ourselves and tell you something about what we do. We'll have goodies and drinks, as always. In alphabetical order, and with our specialties, we are:

Pavel Bělík—Mathematical Modeling and Numerical Analysis
Tracy Bibelnieks—Operations Research and Mathematics Education
Su Dorée—Algebra and Graph Theory
Rich Flint—Mathematics Education
Matt Haines—Voting Theory and Mathematics Education
Ken Kaminsky—Statistics and Actuarial Science
Sri Pudipeddi—Partial Differential Equations
Jody Sorensen—Dynamical Systems
John Zobitz—Mathematical Biology

See you at 3:40 p.m. on Wednesday the sixteenth in Oren 113.

From the Dictionary of Theories

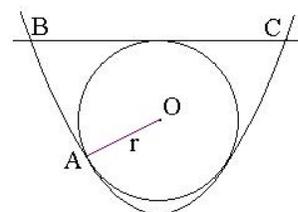
Topology *Mathematics* The branch of geometry which is concerned with the properties of a geometric figure that remain invariant when the figure is bent, stretched, shrunk, or deformed in any way that does not create new points or fuse existing ones.

In the 20th century, the subject consisted of two somewhat different areas: namely, point set topology, where the geometrical figures in question are collections of points; and *combinatorial* or *algebraic topology* (formerly known as *analysis situs*), in which the geometric figures are considered as aggregates of smaller building blocks. Point set topology may also be considered as a generalization of concepts such as continuity and limits to sets other than the real or complex numbers. **J. R. Munkres**, *Topology: A First Course* (Prentice-Hall, 1975)

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Problem of the week...

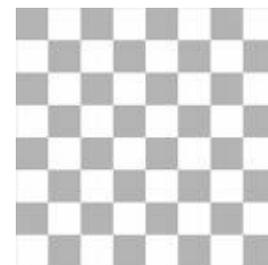
Given a circle or radius $r = 1$ and centered at the origin O , find the equation of the "smallest" parabola which encloses the circle; that is, find the equation of the parabola which is both tangent to the circle and for which the area cut off by the line BC , see the figure on the left, is minimal.



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Puzzle of the week...

How must the eight white and eight black pawns in a chess set be placed on a chess board in such a way that no three pawns end up in the same horizontal, vertical or diagonal line?



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.

L'Augarithms

The bi-weekly newsletter of the
Department of Mathematics
at Augsburg College

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*Sorry

For Today's Graduate, Just One Word: Statistics

By Steve Lohr

Excerpted from an article published in the New York Times, August 5, 2009

MOUNTAIN VIEW, Calif. — At Harvard, Carrie Grimes majored in anthropology and archaeology and ventured to places like Honduras, where she studied Mayan settlement patterns by mapping where artifacts were found. But she was drawn to what she calls “all the computer and math stuff” that was part of the job. “People think of field archaeology as Indiana Jones, but much of what you really do is data analysis,” she said.

Now Ms. Grimes does a different kind of digging. She works at Google, where she uses statistical analysis of mounds of data to come up with ways to improve its search engine.

Ms. Grimes is an Internet-age statistician, one of many who are changing the image of the profession as a place for dronish number nerds. They are finding themselves increasingly in demand — and even cool.

“I keep saying that the sexy job in the next 10 years will be statisticians,” said Hal Varian, chief economist at Google. “And I’m not kidding.”

The rising stature of statisticians, who can earn \$125,000 at top companies in their first year after getting a doctorate, is a by product of the recent explosion of digital data. In field after field, computing and the Web are creating new realms of data to explore — sensor signals, surveillance tapes, social network chatter, public records and more. And the digital data surge only promises to accelerate, rising fivefold by 2012, according to a projection by IDC, a research firm.

Yet data is merely the raw material of knowledge. “We’re rapidly entering a world where everything can be monitored and measured,” said Erik Brynjolfsson, an economist and director of the Massachusetts Institute of Technology’s Center for Digital Business. “But the big problem is going to be the ability of humans to use, analyze and make sense of the data.”

The new breed of statisticians tackle that problem. They use powerful computers and sophisticated mathematical models to hunt for meaningful patterns and insights in vast troves of data. The applications are as diverse as improving Internet search and online advertising, culling gene sequencing information for cancer research and analyzing sensor and location data to optimize the handling of food shipments.

Even the recently ended Netflix contest, which offered \$1 million to anyone who could significantly improve the company’s movie recommendation system, was a battle waged with the weapons of modern statistics.

Though at the fore, statisticians are only a small part of an army of experts using modern statistical techniques for data analysis. Computing and numerical skills, experts say, matter far more than degrees. So the new data sleuths come from backgrounds like economics, computer science and mathematics.

Continue reading at “<http://www.nytimes.com/2009/08/06/technology/06stats.html>.”

Do (the) math...

According to the 2009 edition of the *Jobs Rated Almanac*, of 200 jobs studied, the top five were:

1. Mathematician
2. Actuary
3. Statistician
4. Biologist
5. Software Engineer

Mathematicians came out on top, among other things, because of good work conditions. Also, on the job, they exert themselves mentally rather than physically.

The worst jobs were Lumberjack, Dairy Farmer, Taxi Driver, Seaman, and EMT.

Read more at:

<http://online.wsj.com/article/SB123119236117055127.html>



Augsburg Undergraduate Research

SUMMER 2009

Several mathematics students have participated in summer research, both on and off campus. They participated in a variety of projects. Ask them about their experiences.

Paul Bjorkstrand, mathematics and computer science double major: URGO in Mathematics with **Pavel Bělk**.

Phil Brown, computer science major and mathematics minor: REU in Wireless, Pervasive, and Mobile Computing at Auburn University, Alabama.

Casey Ernst, mathematics and chemistry double major: Faculty Student Team Fellowships at Materials Research Science and Engineering Center, University of Minnesota.

Al Garver, mathematics major: REU in Mathematics at University of Georgia.

Gaby Mamerlinck, mathematics and biology double major: Enhancing Linkages between Mathematics and Ecology (ELME) program at the W. K. Kellogg Biological Station, Michigan State University.

Benjamin Hoffman, mathematics and physics double major: URGO in Mathematics with **Pavel Bělk**.

Eric Howe, mathematics and computer science double major: URGO in Mathematics with **Pavel Bělk**.

Michael Janas, mathematics and physics double major: Center for Astrophysics, Space Physics & Engineering Research (CASPER) Summer Undergraduate Research Program in Physics at Baylor University, Texas.

Melissa Robertson, mathematics and biology double major: URGO in Biology with **David Crowe**.

Ruth Senum, mathematics secondary education major: URGO in Education with **Linda Stevens**.