

L'Augarithms



vol. 24.08

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Mathematics Colloquium Spring Lineup

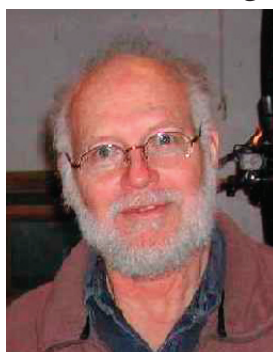
Colloquia are typically held Wednesdays 3:40—4:40 in Oren 113. Highly sought-after refreshments are served.

Jan.	19	Infinite Secrets: The Genius of Archimedes
Feb.	2	Ken Kaminsky, Augsburg College
	→ 16	Loren Larson, St. Olaf College, Carleton College ¹
	→ 23	Nancy Steblay, Augsburg College ²
Mar.	→ 2	Jiang-Ping Chen, St. Cloud State ²
	23	Alicia Johnson, Macalester College
Apr.	6	Doug Dokken, University of St. Thomas
	20	Talks by Students

¹This week's speaker:

Loren Larson, Professor Emeritus, St Olaf College
Inroads

"I want to show you a sliding block puzzle that has fascinated me for the past couple of years. There are some interesting open questions of a mathematical nature that you might enjoy playing with, and you will find it easy to think up your own variations for investigation. It will be an hour of mathematical recreation; no prerequisites, all materials included."



Best School Humor

This came under the heading: How to fail a test with dignity.

What did Mahatma Gandhi and Genghis Khan have in common?

Unusual names

Best Church Bulletin Humor

The following announcement appeared in a church bulletin, or was announced at a church service:

For those of you who have children and don't know it, we have a nursery downstairs.

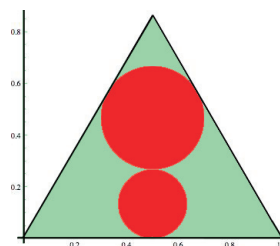
²Attention!-¡Atención!-Achtung!-OBS!

Note that we are having three colloquia in a row—February 16th, 23rd, and March 2nd. Further details will appear in your email.

Problem of the week...

The POTW from vol. 24.07 was correctly solved by **Blake Vliep**. This week's POTW is an expansion of last week's POTW, which some found ambiguous—the circles need not be congruent. Here is the new, extended version of the POTW:³

Given an equilateral triangle of side 1, consider all possible upright figure-eights touching all three sides of the triangle (see the figure at right). What are the largest and smallest areas such figures can assume?



❖³Thanks to Pavel Bělk for this problem

Puzzle of the week...

Solutions to the PZOTW from v24.07 came from **Jazmine Darden**, **Dan Bransford**, and **Casey Ernst**. And now, the new PZOTW:

Ole is 6 years older than his wife Lena. Four years ago Ole noticed that he had been married to Lena for half his life.

How old will Ole be when he has been married for fifty years, if in ten years time Lena will have been married to him for two-thirds of her life?

❖Submit puzzle & problem solutions to kaminsky@augsb.org, or under Ken Kaminsky's door at SCI 137E, or in the puzzles and problems box just outside of Su's office.

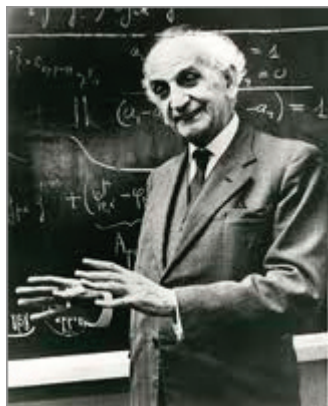
L'Augarithms

The approximately bi-weekly newsletter
of the

Department of Mathematics
at Augsburg College

Editor.....Kenneth Kaminsky
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Great Mathematicians—Cornelius Lanczos⁴



Cornelius Lanczos was born on February 2, 1893 in Székesfehérvár, Hungary, and died on June 25, 1974 at the age of 81. He was a Hungarian mathematician and physicist.

Lanczos' Ph.D. thesis (1921) was on relativity theory. In 1924 he discovered an exact solution of the Einstein field equation which represents a cylindrically symmetric rigidly rotating configuration of dust particles. This was later rediscovered by Willem Jacob van Stockum and is known today as the van Stockum dust. It is one of the simplest known exact solutions in general relativity and regarded as an important example, in part because it exhibits closed timelike curves. Lanczos served as assistant to Albert Einstein during the period of 1928–29.

He did pioneering work along with G.C. Danielson on what is now called the fast Fourier transform (FFT, 1940), but the significance of his discovery was not appreciated at the time and today the FFT is credited to Cooley and Tukey (1965). (As a matter of fact, similar claims can be made for several other mathematicians; some even name Carl Friedrich Gauss as a progenitor of the FFT.)

Working in Washington DC at the U.S. National Bureau of Standards after 1949, Lanczos developed a number of techniques for mathematical calculations using digital computers, including the Lanczos algorithm for finding eigenvalues of large symmetric matrices, the Lanczos approximation for the gamma function, and the conjugate gradient method for solving systems of linear equations.

In 1962, Lanczos showed that the Weyl tensor, which plays a fundamental role in general relativity, can be obtained from a tensor potential which is now called the Lanczos potential.

Lanczos resampling is based on a windowed sinc function as a practical upsampling filter approximating the ideal sinc function. Lanczos resampling is widely used in video up-sampling for digital zoom applications.

Lanczos was an outstanding physics teacher. Books such as *The Variational Principles of Mechanics* (1949) show his explanatory ability and enthusiasm for the subject.

During the McCarthy era Lanczos came under suspicion for possible Communist links. In 1952 he chose to leave the U.S. and move to the School of Theoretical Physics at the Dublin Institute for Advanced Studies in Ireland where he succeeded Schrödinger. When at D.I.A.S. he wrote the classic book, *Applied Analysis* (1956).

According to a short speech delivered Oct 1, 2010 during Lanczos' induction to the NIST Portrait Gallery of Distinguished Staff, his daughter-in-law described his return to Hungary in 1939 from his then-position at Purdue University, when he attempted to convince his family to return to the US with him due to the anti-Jewish Nazi threat. His wife was too ill to travel, and died several weeks later from tuberculosis. He was only able to extricate his 5 year old son and return to the US just before the war began. When the Nazis purged Hungary of Jews in 1944, only his aunt and a nephew survived. His son married, moved to Seattle and raised two sons. Upon hearing of the birth of his first grandson by letter while in Ireland, he replied in his own letter that the boy "was proof that Hitler did not win."

⁴Adapted from Wikipedia, the Free Encyclopedia

Caption Contest

The best caption for the (staged) photo at right will win a prize of **100 ft of genuine yellow an black crime scene tape**. Here's an sample caption: *The body of Luther Proof, the ringleader of the infamous 'Luther Proof Gang,' was removed early Thursday from Professor PB's office, leaving behind only the outline of a proof.*

The above caption is not eligible for the prize since, aside from its quality, it was created by members of the CCJC (Caption Contest Judging Committee), the committee that will judge the caption contest. Preference will be given to math-related captions. Members or relatives of members of the CCJC are ineligible to participate. Send entries to kaminsky@augsborg.edu, under Ken Kaminsky's door at SCI 137E, or in the puzzles and problems box just outside of Su Dorée's office.

