

# L'Augarithms



vol. 23.02

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September 30—October 7, 2009

## Mathematics Colloquium FALL Lineup

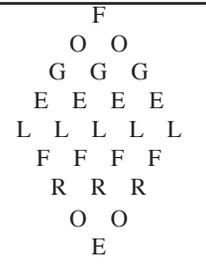
Colloquia are typically held Wednesdays 3:40—4:40 in Oren 113. Refreshments will be served.

Sep.	16	Annual Meet and Greet (the Department, that is)
Sep. →	30	Al Garver, Augsburg College, “(0, 2) - Graphs and Young Tableaux <sup>1</sup> ”
Oct. →	7	Ben Jordan, Harvard University, “The procession of math science and art.” <sup>2</sup>
Oct.	21	Augsburg’s Su Dorée, Jody Sorensen, and John Zobitz, Augsburg reveal their new spring lineup
Nov.	4	TBA
Nov.	18	TBA
Dec.	2	TBA

## Problem of the week...

There were no solvers of last week’s problem. This one should be a bit easier.

We haven’t seen much of our much admired Professor Fogelfroe on these pages lately, but that might change soon. How many ways are there to spell FOGELFROE by starting at the top of the diamond and always moving downward to adjacent letters? Justify your answer.



Adapted from a POTW, with permission, from Bradley U’s ‘potw’ page <[bradley.bradley.edu/~delgado/](http://bradley.bradley.edu/~delgado/)>

## <sup>1</sup>This week’s speaker . . .

. . . is Augsburg senior Al Garver (see the photo →), and here is his abstract:

A (0,2)-graph is a connected graph  $\Gamma$  where any pair of vertices  $a, b \in V(\Gamma)$  have either 0 or 2 common neighbors. Known examples of (0,2)-graphs include hypercubes and incidence graphs of projective planes. Recently a construction of (0,2)-graphs from roots systems associated with lie algebras of type  $A_n$  has been found. Given a target vector  $\beta$ , form a graph denoted by  $\Gamma(A_n, \beta)$  consisting of the subsets of the set of positive roots of  $A_n$  such that the sum of the roots in that subset equals  $\beta$ . For example,  $\Gamma(A_n, \alpha_0)$  where  $\alpha_0 = \alpha_1 + \alpha_2 + \dots + \alpha_n$  is associated to the graph of the hypercube. It is natural to consider other cases with target  $k\alpha_0$  for an integer  $k > 1$ . We have Weyl’s dimension formula for counting the vertices in these graphs, but this formula is difficult to use. We show how tableaux can be used to represent the vertices of these graphs and show how this representation can be used to count the vertices of  $\Gamma(A_n, k\alpha_0)$  using an inductive method. In particular, we have found a closed recursive formula for the vertices of  $\Gamma(A_n, 2\alpha_0)$  and now we are trying to find a recursive formula that will work for  $\Gamma(A_n, 3\alpha_0)$  with the intention of generalizing to  $k\alpha_0$ . I will discuss our progress on this construction.



## Puzzle of the week...

We received puzzle solutions from **Carl Benson** and **Jonathan Chrastek**. Here now is this week’s puzzle:

A man is six years older than his wife. Four years ago he noticed that he had been married to her for half of his life.

How old will the man be when he has been married for fifth years, if it ten years’ time his wife will have married to him for two-thirds of her life?

Submit solutions to [kaminsky@augsborg.edu](mailto: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.

## <sup>2</sup>Next week’s speaker . . .

. . . is Ben Jordan (see the photo →), a doctoral student at Harvard University. His talk is entitled “The procession of math science and art. Here is Ben’s abstract:

The processes by which mathematics, science and art are conducted are both distinct and synergistic. The benefits and pitfalls of my application of this method to predicting integer divisibility are discussed, and the resulting products are presented. These include artistic works in print and video form, as well as contributions to number theory.



## L'Augarithms

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

Editor.....Kenneth Kaminsky  
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## Biography—Hilda Geiringer von Mises (1893-1973)\*

September 28, 1893 - March 22, 1973



Hilda Geiringer was born in Vienna, Austria. She received her Ph.D. in 1917 from the University of Vienna with a thesis entitled “Trigonometrische Doppelreihen” about Fourier series in two variables. From 1921 to 1927 she worked at the Institute of Applied Mathematics at the University of Berlin. Her mathematical interests had switched from pure mathematics to probability and the mathematical development of plasticity theory. During this time she had a brief marriage to Felix Pollaczek, a statistician. They had one daughter who Geiringer raised after the divorce. In 1925 Geiringer applied to teach at the University of Berlin. Controversy about the appropriate independent role of “applied mathematics” within the German mathematical culture in Berlin delayed her approval to become Privatdozent (lecturer) until 1927. In 1930 her work in plasticity theory led to the development of the fundamental Geiringer equations for plane plastic deformations.

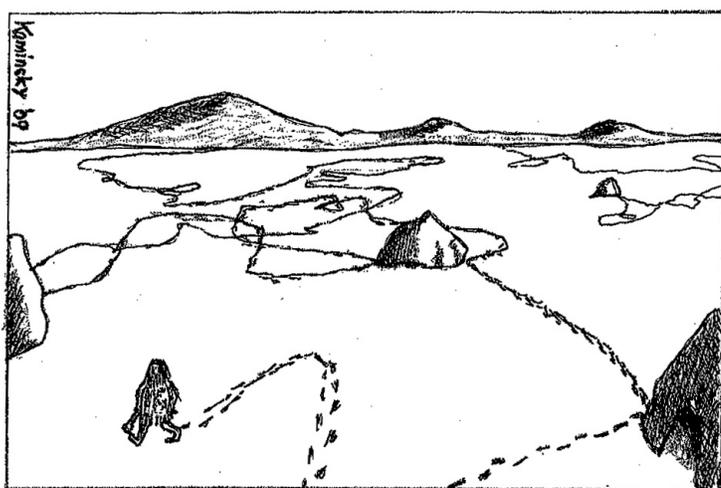
Geiringer remained at the University of Berlin until forced to leave when Hitler came to power. After a brief stay as a research associate at the Institute of Mechanics in Belgium, she became a professor of mathematics at Istanbul University in Turkey where she stayed for 5 years. In 1939 she emigrated to the United States and became a lecturer at Bryn Mawr College. While at Bryn Mawr she married Richard von Mises whom she had worked for at the University of Berlin and who was now teaching at Harvard. In 1944 Geiringer became professor and chair of the mathematics department at Wheaton College in Massachusetts. She remained at Wheaton until her retirement in 1959. Attempts to find a position at some of the larger universities near Boston repeatedly failed, often because of her gender. From 1955 to 1959 she did work as a research fellow in mathematics at Harvard in addition to her position at Wheaton.

Despite the considerable teaching demands of a small college, Geiringer continued her mathematics research in the mathematical basis of Mendelian genetics, the foundations of probability theory, and plasticity. She also worked to complete her husband’s unpublished manuscripts after his death in 1953, particularly his textbook *Mathematical Theory of Probability and Statistics*. Siegmund-Schultze calls her “one of the finest applied mathematicians of this century”.

Geiringer was elected a fellow of the American Academy of Arts and Science. In 1956 the University of Berlin named her professor emeritus. The University of Vienna also made a special presentation to her on the occasion of the fiftieth anniversary of her graduation.

\*Reprinted with permission from <<http://www.agnesscott.edu/lriddle/women/mises.htm>>.

## Cartoon Corner



Meanderthal Man

## Special Offer from Valu-Pak U

Professor Fogelfroe of the Department of Mathematics, Valu-Pak University, Margo’s Forehead, MN, informs us of two new course offerings for Spring 2010, that if you act within the next 30 minutes, you can register for both of these courses for the price of one. MAT 440: *Impartial Differential Equations*, and MAT 452: *Theory of Applications*. For more information, send an email to <[fogelfroe@valupak.edu](mailto:fogelfroe@valupak.edu)>. If you register for a third course, you will qualify for a drawing for a free box of steaks.

## Corrections

The last issue of *L’Augarithms* had some errors. Gaby Hamerlinck’s name was misspelled. Also, the information on John Singleton’s summer work dropped out of the bottom of the page. John is a mathematics and physics double major. His project: URGO in Mathematics with Pavel Bělk.