

The Almagest

The bi-weekly newsletter of the Department of Mathematics and Computer Science. Your trusted source for news.

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November 9, 2015

Alma College
Alma, MI 48801

Math Colloquium – November 16th

Hydrologic models are used to track water flow in order to predict the spread of pesticides, sedimentation and erosion control methods, and the extent of floods. In this talk, **Dr. Morgan Fonley**, Assistant Professor of Mathematics at Alma College, will introduce the selection and development of several hydrologic models to depict the streamflow that results from precipitation on a small watershed. After describing how such models advance in complexity, she will demonstrate the innovative approach of ‘doing hydrology backward,’ a technique which involves collecting data from easily observed fluxes (usually outputs of the system) to describe the more uncertain input forcing terms. Finally, Dr. Fonley will outline ongoing projects to improve on current hydrologic models and watershed practices.

“Unseen H₂O: Using Math Models to Track the Water we Cannot Observe”

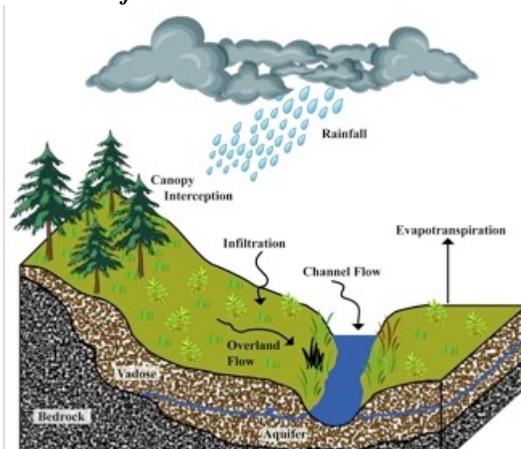
Presenter: **Dr. Morgan Fonley**

Date: **Monday, November 16th**

Time: 4:00

Place: SAC 113

Refreshments at 3:50



Major Field Achievement Test (MFAT)

The MFAT (Major Field Achievement Test) will be given next week on Tuesday and Wednesday evenings in Dow L2.

November 17th and 18th

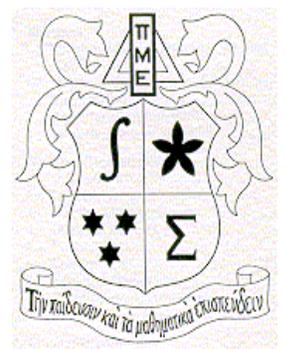
The exams are also given in **February**.

Six Participate in MATH Challenge

On Saturday, November 7th, 78 teams from 28 different colleges & universities participated in the MATH Challenge, a team-oriented math competition sponsored by the Alma College Department of Math & C.S. Alma entered two teams in this year’s competition. The participants were: **Luke Bent, Cheyenne Kalfsbeek, Lauren Kucharczyk, Mason Molesky, Dalton Potter, and Jack Regan**. The results of the competition won’t be known for several weeks. Last year, our top team placed 5th out of 80 teams.

Six New Members of PME

Alma College’s chapter of Pi Mu Epsilon, a national mathematics honorary, recently added six new members to its ranks. The new members are **Luke Bent, Jessica Drife, Nikki Green, Laura Kelly, Mason Molesky, and Jeremy Weber**. Existing members are: **Jacob Blazejewski, Jason McKelvey, Lillie Miller, Krystle Reiss, and Christine Wiersma**.



Winter Term 2016 Registration Is Here

It might be helpful to know what upper-level courses are offered next term and when they'll be offered again.

	Next time offered
MTH 211 <i>Differential Equations</i>	Winter 2018
MTH 223 <i>Math Structures</i>	Winter 2017
MTH 342 <i>Probability & Statistics 2</i>	Winter 2018
MTH 421 <i>Abstract Algebra</i>	Winter 2018
CSC 220 <i>Data Structures</i>	Winter 2017
CSC 240 <i>Algorithms & Complexity</i>	Winter 2018
CSC 440 <i>Compiler Design</i>	Winter 2018

Six Cognates for the Math Major

In addition to the 36 credits of mathematics every major must take, there are two required cognates: CSC 120 and a course, other than a mathematics course, approved by the Department, with a mathematics prerequisite numbered 113 or higher. Below are the approved cognates with prerequisites given in parentheses.

- PHY 121 *Physics I* (MTH 113 or 121)
- CHM 331 *Physical Chemistry* (MTH 122)
- ECN 317 *Econometrics* (MTH 116)
- ECN 318 *Mathematical Economics* (MTH 113 or 121)
- BUS 309 *Finance* (MTH 116)
- CSC 220 *Data Structures* (MTH 120)

Math Help Center Hours

Monday – Thursday, 7-10 pm in Dow L2



The Math Club

The Math Club meets **EVERY TUESDAY** at 9:00 pm in Dow 132. Please come.

Everyone is welcome!

Previous Puzzle of the Bi-week

Suppose f is a polynomial of degree SIX such that $f(n) = \frac{1}{n}$ for $n = 1, 2, 3, 4, 5, 6, 7$.

FIND $f(8)$. NOTE: The answer is **not** $\frac{1}{8}$.

Hint: Consider the polynomial g defined as $g(x) = x \cdot f(x) - 1$.

Notice that $g(1) = g(2) = g(3) = \dots = g(7) = 0$. Since g is polynomial of degree 7, its form is:

$$g(x) = k \cdot (x-1)(x-2)(x-3)(x-4)(x-5)(x-6)(x-7)$$

where k is a constant. Now, consider $g(0)$. We know $g(0) = k \cdot (-1)(-2)(-3)(-4)(-5)(-6)(-7) = -k \cdot 7!$

and $g(0) = 0 \cdot f(0) - 1 = -1$. So, $-k \cdot 7! = -1$, which implies $k = \frac{1}{7!}$.

So, $g(8) = \frac{1}{7!} \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 1$. Since $g(8) = 8 \cdot f(8) - 1$, we have $f(8) = \frac{2}{8} = \frac{1}{4}$. ■

Puzzle of the Bi-week

Suppose you're randomly dealt 5 cards from a standard deck of 52 cards. What's the probability that you'll have *exactly one pair* of cards of the same kind?

A prize of **\$2.00** will be awarded to the 1st student who submits a correct solution to Prof. Sipka.

Student assistants: Christine Wiersma/Jacob Blazejewski
Faculty advisor: Tim Sipka
Distribution: Deb Smith

If you would like to submit an announcement or a short article, please send it via e-mail to Tim Sipka (sipka@alma.edu).