

## UNDERGRADUATE MATHEMATICS SEMINAR

The next meeting of the seminar will be this coming **Monday, October 2**, in Bailey 312 beginning at 7:00. Fresh cider and donuts will be provided.

In the first part of the seminar, Professor Paul Friedman will discuss the who/what/where/when/whys about the Putnam Exam. Then we will discuss how the principle behind the children's birthday party staple, musical chairs, can be applied to solve the Sample Putnam Problem posted in last week's newsletter: Given any five points on a sphere, show that some four of them must lie on a closed hemisphere.

In the second part of the seminar, Professor Karl Zimmermann will present the following talk:

TITLE: Can These Websites Read Your Mind?

ABSTRACT: Have you ever visited one of the websites that claims to be able to "read your mind"? For example, check out <http://www.digicc.com/fido/>. The site seems to know what you're thinking, but what's really going on? In this informal talk, we'll discuss some elementary number theory that explains how two of these "mind-reading" websites work.

## The 2006 Fields Medalists Announced

On August 22 at the International Congress of Mathematicians in Madrid, Spain, four Fields Medals were awarded. The recipients were Andrei Okounkov (Princeton University), Grigory Perelman (currently unaffiliated), Terence Tao (UCLA), and Wendelin Werner (University of Paris – Sud (Orsey)).

The Fields Medals are awarded only every four years. They are often thought of as a mathematical Nobel prize (crossed with the Olympics!) as no Noble prize is awarded

in math! As written in the "Notices of the American Mathematical Society," the Fields Medal "is recognized as the world's highest honor in mathematics."

To read about the accomplishments of these four mathematicians, check out the October 2006 issue of the "Notices of the American Mathematical Society." A copy is available for you to read in Bailey 204, the Math Department Common Room.

## Where is Pedro?

Professor Pedro Teixeira has just started on a new job, as an Assistant Professor at Knox College - a SLAC (small liberal arts college) located in Galesburg, Illinois. Knox College is known for being one of the sites of the "Lincoln-Douglas debates" ([http://en.wikipedia.org/wiki/LincolnDouglas\\_Debates\\_of\\_1858](http://en.wikipedia.org/wiki/LincolnDouglas_Debates_of_1858)). Knox's "Old Main", its administrative center, is the only site from the debates that still exists.

This fall Pedro is teaching Calculus I and Abstract Algebra. Though he has taught these courses a number of times at Union, this has been a new experience for him.

Calculus I (as many other courses) at Knox has a strong "technological component," and emphasizes the heavy use of the software Mathematica. 'This has been fun, but it's keeping me busy,' he reports, noting that he is having to completely rethink the way he teaches things. Fearing the course could become a "how-to-use-the-software" tutorial, with calculus merely as a side note, Pedro is trying to introduce Buchberger's "Black-Box/White-Box

Principle." In a nutshell, this means having a "white-box phase", where a concept is studied in detail in the "good old-fashioned way," and when that concept is thoroughly understood it is "black-boxed." In the "black-box phase" students are allowed to use Mathematica commands that basically trivialize that concept, and they can therefore move on to the "white-box phase" of a new layer of conceptual understanding. His Abstract Algebra class is unique in its own way. It has only 4 students - something relatively normal at Knox - and that represents some different and unique challenges.

Galesburg is a lovely small railroad town in the middle of the prairie. While some people may say that Illinois is so flat that if your dog runs away from home, you can see it for about 5 days, Pedro, who has farmer's blood in his veins, finds that flatness comforting---a farmer's paradise! He is loving the area, and whenever his professional duties allow him to spare a few minutes, he is enjoying his new house or driving his cars in the middle of the cornfields.



Do you have any ideas  
for future newsletters?

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## Resources for Students

- Free tutoring! The Math Department offers a free tutoring service for students enrolled in its calculus courses through Math 115. The Calculus Help Center is open five nights a week, Sunday through Thursday, from 7:30pm to 10:00pm in the seminar room of Sorum House.
- Bailey 204 – The Math Department Common Room. Math majors and minors are encouraged to take advantage of the comfortable chairs, long table, big blackboard, and relaxed atmosphere in the Math Common Room. Meet with your classmates to study or to work on homework problems. Chat with your professors. Read the current mathematics periodicals. Drink some coffee! We would love to see you there.
- Stay informed! The American Mathematical Society has just launched a new service, Headlines & Deadlines for Students, providing email notification of mathematics news and of upcoming deadlines that are of special interest to both graduate and undergraduate students. These email notifications will be issued about once a month, and when there's special news. Imminent deadlines will be included in these emails, which will link to a web page that's a centralized source for information relevant to students and faculty advisors, at <http://www.ams.org/news-for-students/>.
- Fellowship to Teach Math in NYC Thinking about becoming a math teacher? Consider applying for a Newton Fellowship in the Math for America program. For more details, go to <http://www.mathforamerica.org>

## Problem of the Newsletter: September 29, 2006

### ***We're on the Web!***

See us at:  
<http://www.math.union.edu>

under "Department Activities"

Congratulations to **Ian Clemente**, winner of last week's Problem of the Newsletter contest. You can view the winning solution on the first floor bulletin board in Bailey Hall.

Here is this week's problem: Recall that for a natural number  $n$ , we define  **$n$  factorial**, written  $n!$ , as  $n! = n \cdot (n-1) \cdot (n-2) \cdots 2 \cdot 1$ . For example,  $5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 = 120$ .

How many zeros are at the end of  $2006!$ ? (In the above example,  $5! = 120$  ends in one zero.)

Solutions to this problem will be accepted by Professor Friedman until 12:00 noon Thursday, October 5. Please put your solution in his mailbox in the Math Department's office on the second floor of Bailey Hall. Be sure to include your email address with your submission. The student who solves (correctly!) the most PONs will receive a one-year student membership into the Mathematical Association of America, courtesy of the Math Department!