Department of Mathematics April 3, 2009

UNDERGRADUATE MATHEMATICS SEMINAR

Welcome back! The first seminar of the spring term will be:

DATE: **MONDAY, April 6th**

Time & **4:45pm –** Refreshments in the Math Common Room, **Bailey 204**

Location: **5:00pm –** Seminar in **Bailey 207**

In this seminar, two members of this year's Union College MCM team, **Peter Bonventre '11** and **Steven Neier '11**, will present a talk based on the problem they solved during the competition.

(For more information about their MCM experience, please read their article in the February 27, 2009 issue of this newsletter.)

TITLE: Mathematical Modeling of Cell Phone Energy Usage

ABSTRACT: During the 2009 Mathematical Contest in Modeling (MCM), we (with John Robens) modeled the energy consequences of the cell phone revolution. We worked on various aspects of the energy consumption of cell phones by people, involving many different methods of usage including charging, standby, and manufacturing. Our process involved stages of lots of research, followed by simple models that gained complexity as we added more aspects to the solution. Overall, we modeled the energy transition from the current US usage of cell phones and landlines to a strictly cell phone infrastructure. We then modeled the ideal infrastructure for a pseudo-US based on our earlier calculations and models, and found that exclusive cell phone use was more energy-efficient than any combination of cell phones with cordless landline phones. We also modeled the energy waste of various household electronics and appliances from standby power consumption. Finally, we combined our model from cell phone energy consumption with models for US population and economic growth to determine the cell phone usage for the next 50 years. This contest was an enlightening experience that we would like to share and encourage others to participate in the years to come.

Hudson River Undergraduate Mathematics Conference: Calling All Students!

As you probably know, Union College is hosting the HRUMC this year on **April 18th**. This is one of the largest regional undergraduate mathematics conferences in the entire country – and to make it run smoothly, **we need your help**!

There are many ways you can help with this event ranging from helping with set-up, with conference registration, directing the 400 visitors around our campus, to providing IT help, to chairing session talks.

If you would like to volunteer to help with this event please e-mail **Ben Miles** at bmiles@union.edu. You will probably present at a conference at sometime in your mathematical career at this is an excellent chance to see the workings from behind the scenes!

Union College Putnam Exam Team Scores Well

Congratulations to this year's Putnam Exam team, **Dan Gnoutcheff '11, Peter Bonventre '11**, and **Ben Miles '10**, on an outstanding job in this year's competition. There were 3627 contestants from 545 institutions in the 69th competition held on December 6, 2008. The Union College team placed 107th in the event. Each of the team members individually placed in the top 50% of all participants, led by Ben Miles, who placed in the top 25%. Way to go!

Resources for Students

Calculus Help Center - The CHC is open and ready for business! Free tutoring for calculus course through Math 115 is available on Sunday, Tuesday, and Thursday nights from 7:30 – 10:00pm in the Sorum House Seminar room. Start the spring term on a good foot and get assistance when you need it – it's free!

Becker Career Center – While the spring term has just started, you might want to begin planning for a summer job. The Becker Career Center is offering some wonderful service this term, including

- Internship Search Workshops: April 7, April 17, and April 23, each at 1:00pm
- Interviewing Skills Workshop: April 15 at 5:00pm
- Resume Workshop: April 16 at 12:45pm
- Business Dining Etiquette Program (co-sponsored by Sigma Chi). April 22 at 5:00pm in Hale House – but seating is limited! Stop by the Career Center to reserve your seat.

Considering Teaching? Bard College has a one-year Masters in Teaching (MAT) program. They offer Petrie Fellowships: Full tuition grants to qualified students through a selection process that considers academic competence, teaching and leadership potential, financial need, and a commitment to working as an educator in the New York City public schools. For admissions and application information, visit their website http://www.bard.edu/mat/admission-and-financial-aid/

Problem of the Newsletter: April 3, 2009

Congratulations to **Schuyler Smith** for submitting a correct solution to the most recent Problem of the Newsletter. You can see his winning solution on the bulletin boards in Bailey Hall.

Here is this week's problem: This past Saturday, the University of Rochester held its third Math Olympiad. Student from 14 colleges and universities in New York State were given four problems to solve in three hours. The first problem in that competition is this term's first Problem of the Newsletter:

Let n and k be positive integers. An n-digit whole number $X=\underline{A_1A_2\ldots A_n}$ is called k-transposable if $kX=\underline{A_2A_3\ldots A_nA_1}$. Prove that there exist only two 6-digit 3-transposible (i.e., $n=6$ and $k=3$) numbers and find them.

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, April 9th. Email your solution to him (friedmap@union.edu) or put it in his mailbox in the Math Department's office on the second floor of Bailey Hall.