

UNDERGRADUATE MATHEMATICS SEMINAR

Welcome back! We hope you had an enjoyable December recess!!

Important Notice: The seminar is **CHANGING TIME** (for the first few meetings) and **LOCATION** this term! The seminar will still be held on Mondays, but refreshments will be available in **Bailey 204** (The Departmental Common Room) starting at **4:00pm**. After refreshments, the seminar will begin at **4:15pm** in the newly renovated **Bailey 207**.

The first seminar of the term will be this coming **Monday, January 14th**, an exciting talk by **Professor Walter Stromquist** of **Swarthmore College**.

TITLE: The Mathematics of Deep Ocean Search

ABSTRACT: In 1968 the U.S. nuclear submarine Scorpion was lost at sea. The five-month search relied heavily on mathematics and mathematicians, and the techniques used - including Monte Carlo simulation, Bayesian probability updates, and the "random search formula" - set the standard for modern deep ocean search. We'll review the mathematicians' report on the search, give more details on Bayesian updates and the random search formula, and say something about how these methods have been improved in the years since the search.

Mark your Calendars: HRUMC XV - April 19, 2008

The 15th annual Hudson River Undergraduate Mathematics Conference (HRUMC) will be Saturday, April 19th, 2008 at St. Lawrence University in Canton, NY.

The HRUMC is a one-day mathematics conference held annually each spring, attended by students and faculty from colleges, universities throughout New York and New England. It was founded by four colleges, Siena, Skidmore, Union, and Williams, with the goal, as currently stated on the HRUMC's webpage

(<http://www.skidmore.edu/academics/mcs/pages/hrumc.htm>), of "provid[ing] undergraduates with the experience of attending and/or presenting at a professional mathematics meeting designed primarily with the student in mind."

The conference features short, 15-minute talks **primarily by students** and faculty, as well as a longer invited address by a noted mathematician. Again from the HRUMC's webpage, "[t]here are talks which appeal to

specialists as well as talks which are accessible to first- and second-year students. Some talks describe original research done by faculty, students, or by students in collaboration with faculty, while others are more expository in nature." The keynote address this year will be delivered by Jeff Weeks: see [http://en.wikipedia.org/wiki/Jeffrey_Weeks_\(mathematician\)](http://en.wikipedia.org/wiki/Jeffrey_Weeks_(mathematician))

From its origin in 1994 in which there were 69 talks, participation has swelled: last year's HRUMC had more than 200 talks, and over 500 participants from more than 40 institutions. HRUMC is **the** premier regional undergraduate mathematics conference after which several others have been subsequently modeled nationwide.

The Math Department **strongly encourages** you to attend this conference. It provides you with a great opportunity to meet math majors from other institutions, to discuss and share the math that you have been doing, to hear about

work other students have been doing, to get ideas for new projects (oftentimes, senior thesis projects are inspired by previous year's HRUMC talks!), and simply to learn some math that you might not have the opportunity to learn elsewhere.

Not only should you consider attending this year's HRUMC, you should **consider contributing a talk!** **Seniors:** most of you will have finished writing your thesis and will be preparing a talk for the Spring Steinmetz Symposium (just two weeks after the HRUMC). Why not put another feather in your cap, another line on your résumé, and celebrate the hard work you have done by giving a talk (it can even be the same talk!) at this year's HRUMC as well?

Giving a talk at HRUMC is certainly not limited to seniors! In the past, underclassmen from Union College have also delivered talks. Did you do any math-related research during the summer? Have any of the ideas from your math classes sparked an interest you would like to pursue? Have any articles from the math journals in the department's common room caused your gears to turn? Have the Problems of the Newsletters inspired you to ask (and answer?) new math questions? Talk about them to your peers at the HRUMC!

Union College is scheduled to host next year's (2009's) HRUMC. In order to do this, we will be looking for math undergraduates to help plan and coordinate the effort – a couple of whom will serve on the local steering committee in a leadership role. Underclassmen: if this interests you, then you should attend this year's HRUMC to understand what this might involve.

Overnightting it! As St. Lawrence University is quite a distance from Union College and the conference starts at 9am or so, the Union contingent to HRUMC will likely drive to St. Lawrence the night before. To help us plan the trip both logistically and budgetarily, if you are considering attending this year's HRUMC, **please contact Professor Friedman ASAP!**

Problem of the Newsletter: January 11, 2008

Here is this week's problem: Since the last newsletter of the past fall term was issued just before final exams, no one submitted a solution to that issue's Problem of the Newsletter. (At least that is one possible explanation.) So, let's reissue that problem this week.

Taken from an article in FOCUS, a news magazine of the MAA:

Part 1: In the number spiral below, give the next *three* numbers to the right of 11, 2, 1, 6, 19.

13	14	15	16	17			
12	3	4	5	18			
11	2	1	6	19	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>	<input style="width: 20px; height: 20px;" type="text"/>
10	9	8	7	20			
		...	22	21			

Part 2: Find (with proof) a general formula for the numbers in the sequence 1, 6, 19, ... that appear as part of row three as shown.

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, January 17th. 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.