

## Mark your Calendars: HRUMC XIV - April 21, 2007

The 14<sup>th</sup> annual Hudson River Undergraduate Mathematics Conference (HRUMC) will be April 21, 2007 at Siena College in Loudonville, NY (just 12.22 miles and 23 minutes away from Union College – according to mapquest.com).

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 Georgia Benkart from the University of Wisconsin.

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 (in

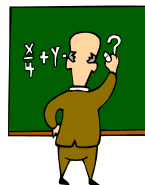
fact, one of this year's senior thesis projects was inspired by last year's HRUMC keynote address!), and simply to learn some math that you might not have the opportunity to learn elsewhere.

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. 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!

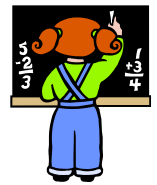
In the past, Union College has hosted two HRUMCs (V and X), and we are looking to do so again in the near future. When we do, we will be looking for math undergraduates to help plan and coordinate the effort. Underclassmen: if this interests you, then you should consider attending an HRUMC or two to understand what this might involve.

With its historical ties to Union College and its focus on undergraduates, is it really a coincidence that "U" is right smack in the middle of HRUMC?



This is the last  
newsletter of the term!

Good luck on your  
finals!



## Professor Zwicker Gives Invited Address

Professor Bill Zwicker recently gave an invited address at the first joint meeting of the Seaway and Metro sections of the MAA (Mathematical Association of America) at Marist College, in Poughkeepsie NY, October 13-14. The lecture

“The mathematics of *not* voting,”

was based on recent research with his Catalonian co-author, Josep Freixas, and concerned voting rules that take account of abstention and absence. “This was a bit different from my normal work,” said Bill. “While most of the mathematics is very basic, our results suggest some opportunities for real voting reform. In fact, I can explain the research to my mother . . . more or less.”

We asked him to explain. “Consider the voting used in Italy for any referendum that seeks to repeal some law, or part of a law. It includes a *quorum* requirement; over 50% of the registered voters must

cast a ballot for the repeal to take effect. This has a perverse effect, in that it is often more effective to defeat such a referendum by staying home and not voting, than by casting a “no” vote opposing the repeal. Politicians are typically opposed to repeal (because they passed the law in the first place) and they have been urging voters to stay home. Some political scientists argue that voter participation, in general, is being undermined in Italy. A number of voting rules in the US and elsewhere have a similar problem.”

What does this have to do with his research into voting? “Our analysis suggests some new alternatives to quorum rules, such as Italy’s. These alternatives have the desired effect of imposing a ‘floor’ on voter participation, but avoid the perverse effects. In particular, an opponent is always better off by showing up and voting “no” than by staying home, so voter participation is encouraged.

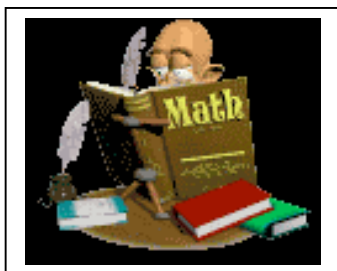
Do you have any ideas for future newsletters?

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### We're on the Web!

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

under “Department Activities”



## Resources for Students

- CHC closing for the year. The last night of operation of the Calculus Help Center for the year 2007 is Monday, November 14<sup>th</sup>. Thanks to all the tutors – **Susan Beckhardt, Jessica DiMarco, Michael Doctor, Dan Stevenson, Kelly Testa, and Peter Wright** – for their contributions to the success of this valuable resource.
- Thinking of Teaching? Math for America (MfA) has a Newton Fellowship Program for students

interested in becoming a high school math teacher in New York City. Fellows receive \$90,000 over five years in addition to a full-tuition scholarship to a full-time graduate education program. This is on top of a New York City teacher’s salary! Applicants need to take a Praxis II math exam (soon!) and apply by February 9, 2007. See the info on the first floor bulletin board in Bailey and the website [www.mathforamerica.org](http://www.mathforamerica.org) for more details.

## Problem of the Newsletter: November 10, 2006

**No new problem this week.** Instead, here is a solution to last week’s PON:

**Problem:** Consider a set  $S$  and a binary operation  $\#$  on  $S$ , i.e., for every two elements  $a, b$  in  $S$ , there is an element denoted  $a \# b$  in  $S$ . Assume  $(a \# b) \# a = b$  for all  $a, b$  in  $S$ . Prove that  $a \# (b \# a) = b$  for all  $a, b$  in  $S$ .

**Idea:** The main idea to use is that “variable names are placeholders” and that by choosing, cleverly, different “ $a$ ”s and “ $b$ ”s, the hypothesis above yields more information than first meets the eye! On to the proof...

**Solution:** Let  $a$  and  $b$  be elements of  $S$ . Assume the hypothesis. Replacing  $a$  by  $(b \# a)$  in the hypothesis yields  $((b \# a) \# b) \# (b \# a) = b$ . Observe that, again by the hypothesis, the underlined term equals  $a$ . This gives the result:  $a \# (b \# a) = b$ .