

## UNDERGRADUATE MATHEMATICS SEMINAR

After a standing-room-only capacity crowd at the first seminar, the next meeting of the seminar will be this coming **Thursday September 27**, with refreshments beginning at 3:45 in the Math Common Room, Bailey 201, and the lecture following at **4:00 in Bailey 201**.

In this week's seminar, **Professor William Thomson** from the **University of Rochester** will present the following talk:

### TITLE: On the Problem of Adjudicating Conflicting Claims

**ABSTRACT:** Suppose that the claims against an estate, or against of a bankrupt corporation, add up to more than the total worth. How can we decide how much to pay each claimant? This simple question has led to a wealth of study in mathematical economics. I'll focus both on the possible axioms (mathematical rules of fairness or consistency) one might desire in a solution, and on the actual rules that satisfy these axioms. I'll present the problem and give examples of rules\*, one of which has its origins in the Talmud. I'll then introduce two recently formulated, broad families of rules. Topics include the idea of consistency, the Elevator Lemma, parametric rules, and an idea of how to identify consistent rules. These last items are what the mathematically inclined will have the most fun with. ***The level of the talk will be suitable for students and faculty both.***

**Biographical Sketch:** William Thomson is Professor of Economics at the University of Rochester. He is past president of the Society for Social Choice and Welfare, currently serves as editor-in-chief of the International Journal of Game Theory, and is on the editorial board of six other research journals in mathematical areas of economics. His 36 Ph.D. students cover the globe, from Taiwan and Japan to Turkey and Belgium, and from Pasadena to Albany.

\* Several copies of Professor Thomson's recent paper, [Two families of rules for the adjudication of conflicting claims](#), are available in the Mathematics Department Common Room.

## Student-Faculty Dinner with Professor Thomson

Are you interested in both Economics and Mathematics? Considering going to graduate school in Economics? Several students and faculty will be joining William Thomson for dinner after his talk on Thursday. He'd be an excellent person with whom to discuss graduate school in economics. The dinner will be at a restaurant near campus, we will provide transportation, and we'll cover your meal cost. If you think you may be interested, send an e-mail soon to [zwickerw@union.edu](mailto:zwickerw@union.edu).

## My Summer Experience, by Jessica Rudin '08

This summer I worked in Business Area Controls in Corporate Finance under Global Banking at Deutsche Bank on Wall Street in NYC. What that means (in English) is that I did the accounting for a few different desks of traders. I would record their daily trades, which would update the month-to-date reports and the year-to-date reports. I built multiple Excel spreadsheets that linked all of the numbers and did numerous reconciliations to make sure that a variety of different ledgers tied out. At the end of each day, every different record in the bank had to be showing the same numbers. If there was a discrepancy, I had to figure it out. At the end of the day, I would produce the daily P/L reports (profit/loss reports) to show how much money each desk of traders had made (or lost) on that day.

I did a lot of other similar daily tasks, as well as a variety of independent pricing verifications. That is, I would make sure that the traders were buying and selling different securities at reasonable, up to date prices. In some cases, the price of something that was bought a year ago (and still held on our books) may have changed in value, so I would need to account for that change in our records. These tasks are just a few of the many accounting responsibilities that I was given over the past ten weeks. It was very interesting, I loved whom I worked with, and I learned so much, but unfortunately, I did not personally find the accounting work to be stimulating enough. Still, it was an unbelievable experience to work at a major bank on Wall Street, and I (**continued on page 2**)

was introduced to a whole world that I knew nothing about, and that I am now deeply interested in.

The internship program itself was amazing. Once a week we would have different "Lunch and Learn" sessions with certain influential people in the bank, ranging from the CFO of the Americas to the man in charge of the Deutsche Bank fine arts collection and the annual Deutsche Bank Golf Tournament. There were multiple, organized evening social events for the interns as well, such as bowling, comedy clubs, and the Lion King on Broadway.

Getting the internship was the tricky part. Unfortunately, not many companies recruit at Union. We're not exactly a "target school" for these big investment banks. That's not because Union isn't a great school, but rather because they can recruit business, finance, and accounting majors from Harvard, Princeton, Yale, and Penn. Nobody there really knew what Union was. However, last year, I spent a lot of time on the Becker Career Center's alumni network, made a lot of phone calls, made a couple of connections with Union alumni in the business world, and quickly found that there were at least five Union College graduates with big jobs at Deutsche Bank. In fact, a man named Rob Danziger, an investment banker at DB, recently became a Trustee at Union. There's definitely a powerful network of Union alumni with Wall Street jobs, but unfortunately, they rarely come back to Union to recruit. You are left to do a lot of the networking on your own, but once you contact them, they are always very willing to help. You really need to take the first step though, and go out of your way to show them that you're interested.

Over the course of the internship, I got a lot of exposure to different areas of the bank. I was able to get a look into the world of investment banking and sales and trading. I learned about all of the different products that Deutsche Bank offers to its clients (hedge funds, mutual funds, insurance companies, private clients, etc). I learned how companies go public, issue stocks and bonds, and generate profits. I learned about the risks and benefits of investing in different types of companies in different sectors of the business world. I sat with Foreign Exchange traders who were buying and selling different currencies and building different securitized products. I learned how to hedge against risky trades in order to be protected against huge potential losses. I got a firm grasp on the causes of the credit crunch and the extreme volatility that has overcome the markets over the past few weeks. I also got a taste for how the government and the Federal Reserve can impact the economy.

I was most intrigued by the intensity and excitement on the trading floor. Everyone sits in a huge room at these long desks with six personal computer monitors. There are about twenty flat screen TVs scattered around the room, all on CNBC. Everyone is attached to Bloomberg, a premier site for news and financial information. You know what's happening as it happens, even before it hits the media. You're on the phone with different clients, making trades, making the markets. I found it all very exciting. That being said, I learned that it's also very stressful, and when people are losing money, the traders don't get much sleep.

The best part is that trading is all Math. You're constantly calculating different prices, looking at different interest rate curves or credit default curves, and computing your overall profits and losses. In fact, I wound up getting a few interviews at the end of the summer for a full time position in Sales and Trading, and they decided that they would focus a majority of one interview on my math background (since I clearly don't have the technical financial background of the other students with whom I'm competing).

The world of finance and banking has an entirely separate language. Only after I broke through the barrier and learned all of the different terms and abbreviations was I really able to have a full conversation about what is going on in the markets. Breaking through this language barrier took me the first few weeks, and although I learned an incredible amount, I have barely scratched the surface. I did, however, realize that I would definitely enjoy doing something in the world of business and finance, at least for a few years after Union. In fact, I just received and accepted an offer in the Global Markets Analyst program (Sales and Trading), and I'll start next summer working full time at Deutsche Bank.

## Internship Opportunity for Students

After reading Jess' article (above), you can clearly see the value of summer internships. **Thang Pham '07** wrote to Professor Friedman recently:

"I am into my second month of work for IBM, and I am learning more of my job responsibilities. It is very much different from school - more challenging and intensive. My former manager, whom I interned with during the last two summers, will be coming to Union College to recruit on Monday, Oct. 1. Another alum and I will also attend. He is looking for Computer Science, Computer Engineering, and **Math majors** for an **internship** in his department in Poughkeepsie, NY. Interns will be given projects related to System Z software development, test, and support. The recruiting event will be held on **Monday, Oct. 1** from **3-5 PM** in **College Park Hall**. Could you pass this along to your students and encourage them to come and bring a resume? Thank you."

## Problem of the Newsletter: Sept. 21, 2007

Congratulations to the four students **Brandon Bartell, Susan Beckhardt, Dan Gnoutcheff,** and **Schuyler Smith** who submitted correct answers to last week's problem. You can view a winning solution on the first floor bulletin board in Bailey Hall.

**Here is this week's problem:** Prove that if  $a$ ,  $b$  and  $c$  are odd integers, then  $ax^2 + bx + c = 0$  has no rational solutions.

Professor Friedman will accept solutions to this problem until 12:00 noon Thursday, September 27. Email your solution to him ([friedmap@union.edu](mailto:friedmap@union.edu)) or put it in his mailbox in the Math Department's office on the second floor of Bailey Hall.

**See the posted solution to last week's PON for a special BONUS problem!!**