University of Utah
Department of Mathematics

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# A f t e r m a t h

## Win a Free Trip!

Attention all undergraduate students! This year's Undergraduate Problem Solving Contest is about to start. The first problem will be posted Monday, October 6, on a bulletin board in the main hall of the JWB, and a new problem will posted approximately monthly. There are prizes for the monthly winners, and the overall winner will receive a trip to the Problem Solving Contest national finals in Providence, RI. Still not sure you want to participate? Here is what last year's representatives at the national competition (held in conjunction with MathFest) had to say about their experiences:

from Batdorj Lhaajav (our winner):
"Being part of the MathFest at Boulder, CO were some of the most unforgettable days of my life. The program was packed with lectures on different topics. One of them was called "The Art of Mental Calculation," and the lecturer could multiply two seven-digit numbers correctly in a short period of time in his head. He was also able to say what day of the week a person was born on with knowledge of the person's date of birth. He inspired me to use my brain more than ever. From the student problem solving competition I learned that it is a good idea to try to use more of my brain than the calculator to do any simple calculations. I used to use a calculator a lot, but not now. Finally, good luck to the next competitors from the U of U to the national problem solving competition in Rhode Island."

from Brian Knaeble (our student representative):
"Things started off with the opening banquet and a performance by Tom Noddy entitled "Bubble Magic." While he explained how his creation of an Icosohedron bubble was possible I found my mind attempting two things at once. I was seated at a table of strangers and a post-doc from Wisconsin had offered the following math riddle: "I will place n coins on the table and will tell you how many heads there are, your job will then be to separate them into 2 piles with an equal number of heads in each pile, you will be blindfolded throughout and will not have the ability to distinguish heads from tails by touch." By the end of "Bubble Magic" I had solved his problem and offered him a riddle of my own. He liked it so much that we agreed to exchange all of our riddles. If you are a student and enjoy solving problems, be on the lookout for the monthly problems that will be posted in JWB. If you answer correctly, you could win a free trip to Providence, RI, and a chance to represent Utah at MathFest 2004."

## Congratulations, Andrej

Andrej Cherkaev has been elected to the European Academy of Sciences, together with several Fields medalists and other leading scientists from all over the world. This is certainly a great honor and we want to extend a hearty "Congratulations" to Andrej.

## *Personalities!*


Scott Crofts???

Scott Crofts is one of our new VIGRE graduate students. He comes to us from Evans and Sutherland, where he worked as a software engineer for three years. Scott is from Chicago, which is where his family resides.

Because Scott has been a graduate student for just over one month now, his research focus is on the current homework sets for his classes, which he hopes to complete before they are due. Although Scott has no spare time, he has managed to become pretty good at pencil tricks, and he manages to maintain a pretty good sense of humor.


Bob Bell

Bob Bell, (Assistant Professor, Lecturer), is also new to the department this year. His research is in Topology, specifically geometric group theory, and more specifically CAT(0) spaces, Artin groups, and Coxeter groups. (Attend the 10/14 GSS to listen to a survey on Coxeter groups).

Bob's wife, Liz, is a theatrical lighting designer who is teaching a lighting course in the theatre department at the U this semester. Her family lives in Ohio, whereas Bob's family lives in Florida. Bob and Liz have a cat named Astrid, who likes shoes and string.

Bob has been called "ruthless" when it comes to playing games involving strategy and wheeling and dealing. (For the ultimate example of such a game, according to Bob, check out Diplomacy at http://devel.diplom.org/DipPouch.) He also knows a lot of useless Beatles trivia, and you might be surprised to learn that he's done a loop d loop in a sailplane (his uncle was the pilot).

Now that you know a little bit about Bob, you might choose to refer to him by his Hobbit name, Bob Muddyfoot from LongCleeve. To discover your very own Hobbit name visit www.barrowdowns.com/middleearthname.asp.

# From the USAC

by Carrie Beach

Have you ever wondered what Albert Einstein's most famous equation ($E=mc^2$) means? Perhaps you're familiar with the equation but unfamiliar with how it came to be, or as David Bodanis puts it "the stories along the way are as much about passion, love, and revenge as they are about scientific discovery." Bodanis writes about these stories in *$E=mc^2$: A biography of the world's most famous equation*. He begins this biography by telling about Einstein's life, his struggle obtaining a degree at the Swiss Federal Institute of Technology, his lack of success at the patent office, and his struggle to stay up to date with new physics research, as well as the publication of his article on electrodynamics and his derivation of $E=mc^2$.

Bodanis then goes on to E (energy) and Michael Faraday, an excellent apprentice bookbinder who no longer wished to be a bookbinder. One benefit of his job was that there were a lot of books around, so he seized the opportunity to read them. Through a shop visitor he acquired tickets to a series of lectures at the Royal Institution. There he saw Sir Humphry Davy. Faraday took the notes he had taken during Davy's lecture, rewrote them, inserted a few drawings of Davy's demonstration apparatus, bound them together with his skill as a bookbinder, and sent them to Davy. They met and not long after, Davy hired Faraday as a lab assistant and Davy became Faraday's mentor.

After this story, Bodanis goes on to explain the rest of the equation and the race for the atomic bomb. He talks about how the equation is used in modern devices from PET scanners (used to find tumors) to televisions and smoke alarms. He also discusses how it's used to explain how stars ignite and how black holes are created. At the very end of the book are detailed notes for those who desire more mathematical or historical depth. More information is available on the web at dbodanis.com. This book is published by The Berkeley Publishing Group and will be available at the Marriot Library as soon as I return it.

# The Real Deal

The real Scott Crofts. (Phew! For a minute there you were thinking you'd be afraid to run into him around the department!)

# Mathematical Morsels

There is a museum (die "Schatzkammer", the "treasure room") in the Hofburg in Vienna. After entering you pass through several doors, each carefully and constantly watched by serious looking armed guards. In the innermost sanctuary you get to see the Imperial Crown of the Holy Roman Empire, heavy, solid, and made from gold and precious stones. It used to be worn by the German Emperors on ceremonial occasions.

We have a similar place in the math department (minus the armed guards)! If you have been around long enough you may remember a certain Thursday in the fall of 1972 when the world's slide rule industry collapsed in one seismic event, caused by the appearance of the first electronic (Hewlett Packard HP-35) calculator. Before that event, scientists, engineers, and some mathematicians, used slide rules comfortably and effectively on a routine and daily basis. There used to be semester long courses at high schools and universities on how to use a slide rule. We have a small slide rule exhibit in our library. These rules were donated to the math department by Chris Smith of the U music department who inherited them from his father. Have a look the next time you are in the library. If you are really interested I (P.A.) can show you a couple more (after locking the doors) and I might even let you use one!

Slide rules are based on just one very simple mathematical fact, that the logarithm of a product equals the sum of the logarithms. Despite that simplicity, in their heyday they reached a level of sophistication that is hard to appreciate nowadays. You get a glimpse of that sophistication by noting the many (up to 30) scales on those ancient rules. Also note the many special marks, each with a specific meaning.

# Upcoming Events

Wednesday, October 22 - Mathematics Career Day, ASB 210, 1:00 - 2:30.

Thursday, October 30 - University Career Fair

Aftermath is published monthly during the academic year. Issues of the newsletter will be archived on the web at:

*www.math.utah.edu/newsletter*

The Aftermath is edited by Peter Alfeld and Angie Gardiner. Please contact either one of us if you have an idea or article to submit.