

Mathematics Alumni Newsletter



Summer 2007

Greetings From The Chair



The Department is on the move! Mostly, this note is about people, our most important commodity, but there is some information related to space issues at the end.

The first move is one I am unhappy to report. Camie Bates has retired after teaching in our department since 1992. Over the last several years, she has managed and taught our Calculus for Business and Social Sciences class, which we have been teaching to about 500 students per year (mostly from the Daniels College of Business). Camie has brought enthusiasm, uncompromising integrity, and focus to this challenging class. Camie has also handled transfer credit issues for Foundations classes, a job which requires sound judgment and a more than keen eye. We will miss her, but look forward to her frequent visits to the department.

Also on the move (*rank wise!*) is Dr. Michael Kinyon, who joined the faculty in Autumn, 2006. In the short time he has been here, Michael has integrated himself fully into the department and we are lucky to have him here. I am happy to report that he has been promoted to Associate Professor with tenure.

During this past year, we have been fortunate to add three new tenure track faculty, two new lecturers, a new Dean of Natural Sciences and Mathematics who comes to DU from the Department of Mathematics at Ohio State University, and half of Don Oppliger. Let me tell you a bit about each of them.

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Our three new assistant professors are Natasha Dobrinen, Nikolaos Galatos, and Frederic Latremoliere. Each is outstanding in her/his own right, and together they complement each others' research and those of our current faculty. Each is an outstanding teacher and fits our scholar-teacher model perfectly. We will be a stronger department because of their presence.

Natasha completed her Ph. D. in 2001 at the University of Minnesota. She has been an NSF Vigre S. Chowla Research Assistant Professor at the University of Pennsylvania between 2001 and 2004, and since 2004 she has held a postdoctoral position at the Kurt Gödel Research Center for Mathematical Logic in Vienna, Austria. Her specialties are mathematical logic and foundations of mathematics. This area includes computability and recursion theory, set theoretic topology, and measure theory.

Nick finished his PhD in 2003 at Vanderbilt University. Since then, he has split his time between Vanderbilt and the Japan Advanced Institute of Science and Technology. At the latter institution, he has been an Assistant Professor since 2005. He is a specialist in the area of residuated lattices, which itself has connections with certain types of logic. Along with his many research articles, Nick is a co-author of the text, **Residuated Lattices: an algebraic glimpse on substructural logics**, published by Elsevier in April 2007.

Frederic received his Ph. D. in 2004 at the University of California at Berkeley. He has had a postdoctoral position at the University of Toronto and a visiting Assistant Professorship at the University of Cincinnati. His specialty is C^* -algebras and C^* -dynamics, an area which offers the possibility of close collaboration with many of us. Incidentally, Frederic also has a Master's degree in Statistics and has extensive knowledge of mathematics of astronomy and mathematics of finance. We are looking forward to his sharing this expertise with our students and with us.

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Greetings From The Chair

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Our two new lecturers are Allegra Reiber and Annette Locke. Allegra is completing her dissertation in algebraic topology at Notre Dame. She is a wonderful teacher who brings her infectious enthusiasm about mathematics to her classes. Annette has been teaching in our Department for three years while working on her doctorate. She's a terrific teacher and has handled some challenging assignments extremely well.

Dr. Alayne Parson becomes the Dean of Natural Sciences and Mathematics on September 1, 2007. Prior to coming to DU, Dr. Parson was Professor of Mathematics at the Ohio State University, specializing in number theory. We are looking forward to her participating in mathematical activities as much as her new job allows. We welcome her to the department and the university.



Dr. Alayne Parson

Photo courtesy of Ohio State University

Don Oppliger, who has split time between the Mathematics Department and the Computer Science Department over the last few years, became full time in mathematics on August 1. We will be teaching 2 ½ times the number of students in our Calculus for Business and Social Sciences class for at least the next two years. This entails 20 60-student lectures and 80 15-student sections each year. Don's primary new responsibility, and it is daunting, is to be course coordinator for this class.

We are also on the move space-wise. Thanks to an agreement with the School of Engineering and Computer Science, we have reallocated some space in John Greene Hall and I'm pleased to let you know that the entire Mathematics Department is staying in John Greene Hall. To accomplish this, some space originally assigned to Mathematics in what is now the DU High School Building will now be used by our Engineering and Computer Science colleagues.

The long term prospects for housing our department are uncertain, as a new building planned for Engineering and Computer Science has a footprint that covers some or all of John Greene Hall. I will raise the issue of finding suitable long term space for the Mathematics Department with Dean Parson once she arrives on campus and has a moment to catch her breath.

Jim Hegler

The Making Of A Scientist

For the fifth summer, the University of Denver hosted high-school students from around the country for the Making of a Scientist program. The course curriculum was developed through an collaboration between three faculty members: Alvaro Arias (Mathematics), Faan Tone Liu (Computer Science) and Julanna Gilbert (Chemistry) and, in this two week course, the students attended classes taught by DU science and math faculty and participated in small group projects.

An article about the Making of a Scientist program recently was published on the DU Web site and the entire article, written by Chase Squires, may be found at www.du.edu/today/stories/2007/07/2007-07-09-science.html. Some of that article is excerpted here.

"The University of Denver recently offered students from across the country a taste of college life, a start on their college careers and an intensive jump start on a future in

mathematics, computers and science through the Making of a Scientist program.

...This June, 43 juniors and seniors — including a group from Memphis supported by local civic leaders and several from Southern California supported by a local migrant worker support group — took part in two weeks of intense classroom work, which earned them three college credits. Days were packed with lectures, group problem-solving sessions and research with DU professors.

...Students in the program are treated like young scientists, and they are challenged at every turn. Success depends on plenty of hard work and classroom learning.

...Classes include the study of modular arithmetic, number theory and cryptography — all concepts in discrete mathematics, the basis for computer science. In addition, the students are exposed to computer programming and design algorithms that are converted to computer programs.

They learn about designing computer programs that collect and analyze data in the chemistry laboratory, where they use sophisticated computer models to make predictions about chemical structures...."

This newsletter is published semiannually and your submissions are welcome.

If you have an article, a picture, or information that might be of interest to other alumni and you would like to have it published in the newsletter, please send it to:

Don Oppliger, DU Math Dept, 2360 S. Gaylord, Denver, CO 80208 or e-mail to dopplige@du.edu

Please include your name, mailing address, and email address so we can contact you.

John Greene Hall To Reach The Half-Century Mark

One, Nine, Five, Eight. Nineteen Fifty Eight.

1958 ... Gas cost 24 cents a gallon, a postage stamp was 4 cents, and a loaf of bread went for 19 cents. (Unfortunately, however, the minimum wage was only \$1.00/hour and the average annual income was \$4650.00.)

1958 ... The first successful American satellite, Explorer I, was launched and the first-ever successful satellite, Sputnik 1, launched by the then Soviet Union, decayed from its orbit.

1958 ... The first International House of Pancakes opened in Toluca Lake, CA, the show *Have Gun, Will Travel*, debuted on the radio and the 1958 Edsel appeared (production had actually started in 1957).



1958 ... Hit songs were "Great Balls of Fire", Jerry Lee Lewis; "Catch a Falling Star", Perry Como; "Splish Splash", Bobby Darin; and "Tom Dooley", The Kingston Trio.

1958 ... Nikita Krushchev became premier of the Soviet Union, Fidel Castro's army began attacks on Havana, and Elvis Presley was inducted into the U.S. Army.



And finally, an event little noted in the history books – John Greene Hall was opened.

2008 is the 50th anniversary of the opening of John Greene Hall. If anybody has any specific memories associated with this unique building that you would like to share with us, please send them to us. A surface mail and an e-mail address can be found in the grey box at the bottom of the second page. We would also welcome any suggestions regarding how we can best celebrate the event.

We have been able to locate a number of pictures from the early days of John Greene Hall that we plan to share with you. Just as an initial teaser, however, below is a picture of John Greene Hall before the third floor was added. I suppose we could call John Greene Hall the original "pop-top" in the south Denver area. (Note the "vintage" automobiles sitting in the parking areas.)





Math Puzzler

The puzzler answer is a bit long this time around but, as we noted when the problem was presented, there is a story worth telling associated with it.

The previous puzzler read ...

Two persons were riding their bicycles toward one another, each traveling at a constant 10 km/hr. When they were 10 km away from each other, a fly took off from one bicycle and flew to the other bicycle at 20 km/hr, then it flew back to the other bicycle, and then back and forth until it was crushed between the two bicycles when the two bicycles collided. Pretty stupid fly, all around. How far did the fly fly?

Solution:

There is more than one way to solve this. First, let's look at the easy way. The two bicycles were 10 km apart. They crash half-way between them in half an hour. The fly travels 10 km in that half an hour. That's the answer.

How about the hard way? The fly goes twice as fast as the either bicycle. So the fly initially covers $20/3$ km while the bicycle A covers $10/3$ km. The fly turns around. Bicycle B is now $10/3$ km away. The fly returns to bicycle B, going twice as fast as bicycle B. So the fly goes $20/9$ km while bicycle B goes $10/9$ km. Then the fly turns around and goes $20/27$ km, while bicycle A goes $10/27$ km. After an infinite number of flights, the fly has gone $20/3+20/9+20/27+20/81+\dots$. That appears to be a geometric series. The sum is $S=a/(1-r)$, where a is the first term $20/3$, and r is the ratio of successive terms $1/3$. So the sum is 10 km.

Thanks to Jim Loy's Web site, www.jimloy.com, for this puzzler.

And now for the story —

When this question was put to the mathematician John von Neumann, he solved it in an instant, and thereby disappointed the questioner: "Oh, you must have heard the trick before!" "What trick?" asked von Neumann; "all I did was sum the infinite series."

The speed with which von Neumann could think was awe-inspiring. G. Polya admitted that "Johnny was the only student I was ever afraid of. If in the course of a lecture I stated an unsolved problem, the chances were he'd come to me as soon as the lecture was over with the complete solution in a few scribbles on a slip of paper." Abstract proofs or numerical calculations - he was equally quick with both, but he was especially pleased with and proud of his facility with numbers. When his electronic computer was ready for its first preliminary test, someone suggested a relatively simple problem involving powers of 2. (It was something of this kind: what is the smallest power of 2 with the property that its decimal digit fourth from the right is 7? This is a completely trivial problem for a present-day computer: it takes only a fraction of a second of machine time.) The machine and Johnny started at the same time, and Johnny finished first.

Minor editing has been made to this story by P. R. Halmos, Indiana University, writing on the Web site, stepanov.lk.net/mnemo/legende.html.

The following individuals responded with the correct answer: Spencer Wagner (a current undergraduate), David Gwinn (BA 1973), Paul E. Williams (BA, 1952), Elie M. Dick (PhD, 1972), Mary Krimmel (MA, 1970), and Forrest L Blassingame (MA, 1956, who noted that he got the answer from his son-in-law, Richard Bland).

This month we have two new puzzlers for you to enjoy.

Bill and Ted's Excellent Race

Bill and Ted race each other in a 100 yard dash. Bill wins by 10 yards. They decide to race again, but to make things fair, Bill starts 10 yards behind Ted.

If they both run exactly the same speed as before, who wins the race?

Seating Arrangements

Suppose that five people are randomly assigned seats in a room which has 15 chairs. Determine the probability that no two people are seated next to each other if:

- the chairs are arranged in a row
- the chairs are arranged in a circle

Send your solutions to Sharon Butz - sbutz@math.du.edu

If you have a favorite puzzler that you think might be good to put into the newsletter, please send it to dopplige@du.edu.
(And please be sure to include the solution!)