

“All the v’s that’s fit to print”



# Department of Mathematics

# Newsletter

Volume 9, Number 1 Fall 2004

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## Outstanding Student Awards

During "end of year awards ceremonies" in May 2004, these two mathematics students were honored for academic achievements during Academic Year 2003/2004.

**Raymond ‘Ray’ Martin, Jr.** was named the Outstanding Undergraduate Student in Mathematics

**Lois Karasa** was named the Outstanding Graduate Student in Mathematics.

Congratulations to Ray and Lois for jobs very well done !!

## Around the Department

This fall marked the start of **Radu Cascaval’s** second year in the UCCS math department. His first year here was a full one indeed! Radu presented his research work at the Fifth International Conference of Differential Equations at Cal State University -

Pomona in June, in two separate sessions. He also visited and gave a talk in the Applied Math Seminar at CSU - Fort Collins. In October, he gave a talk at the SIAM conference on Nonlinear Waves at University of Central Florida in Orlando (luckily, this was a week after all hurricanes have passed!). In preparation for his trip to Orlando, he learned a lot about the math modeling challenges presented by hurricanes, and presented his findings during one of the Fall 2004 Math Club meetings. Last but not least, in February he coordinated a team of three students who competed successfully in the Mathematical Contest in Modeling, which was a very fun experience for all involved. (See the article below about this competition.) Of course, the most important event in Radu’s life was the birth of his son Calin in November 2004. Congratulations to Radu and Raluca !!

A change in department leadership occurred this past summer. **Rinaldo Schinazi** took over the reins, succeeding Bob Carlson, who was chairman for two years. In addition to his departmental administrative duties, Rinaldo had a full year as well. He visited York University in Toronto in May 2004 and Ecole Polytechnique in Lausanne in July 2004. (Both visits were quite pleasant and fruitful. Lausanne has a wonderful festival in July with lots of concerts, plays, circus acts and so on and it is completely free!) Rinaldo was also awarded a National Security Agency grant that will fund his research for the next two summers.

**Bob Carlson** and his wife, Linda, made their second adoption trip to China in April. Sisters Emily (now 3 years old, from Wuhan in Hubei province) and Amber (almost 2, from Cenxi in Guangxi province) are doing extremely well. After stepping down as department chair in August, Bob began a sabbatical in the Fall. His main research project is a collaboration with Radu Cascaval on large scale modeling of the human circulatory system. Some ideas that were previously developed for purely theoretical reasons are playing a large role in this very applied project. Bob recently finished writing a textbook for Math 341 and 431, and is actively searching for a publisher.

Much of **Jim Daly**'s time this past year has been spent on K-16 educational outreach activities. Jim is an integral part of TEAMS, a group consisting of UCCS faculty and educators from the local K-12 school districts. The group submitted two large grant proposals last year, aimed at improving the content knowledge of secondary math and science teachers. Jim also organized three instructional workshops in statistics: one each for middle school, high school, and university faculty. Jim was also a co-Principal Investigator in a UCCS scholarship program, which was funded for four years at \$400,000 by the National Science Foundation. This fall Jim has been on sabbatical, working on various research problems and some K-16 projects. He visited both Hungary and New Mexico as part of his research program.

**K.M. Rangaswamy** was quite busy this past year. As part of his sabbatical leave (Fall 2003) he spent the months of November and December at the Charles University in Prague, where he had research interactions with Ladislav Bican and Jan Trlifaj. During Summer 2004, Ranga was an invited speaker at the International conference on *Commutative Rings and their modules* at Cortona, Italy. The conference site was a beautiful palace surrounded by the vineyards of Tuscany and owned by the University of Pisa. Also that summer, he obtained a

grant to find ways to incorporate the women and gender issues as part of a math curriculum. In Fall 2004 he started teaching the Math 414 - Modern Algebra course. This course involves ideas cultivated by a famous woman mathematician named Emmy Noether, who faced enormous challenges in becoming a research mathematician, because she was a woman and because she was of Jewish origin. Students were asked to form small teams to write a project about some of the mathematical contributions of one or two woman mathematicians. (See accompanying article below.) Further, in sketching the biography of these researchers, the students are expected to integrate issues of gender and race that impacted the lives of these female mathematicians.

**Greg Morrow** participated in the 6th World Congress of the Bernoulli Society for Mathematical Statistics and Probability in Barcelona, Spain during Summer 2004. His paper with Y. Zhang on "The sizes of the pioneering, lowest crossing, and pivotal sites in critical percolation on the triangular lattice" was accepted by the Annals of Applied Probability in November 2004. In addition, Greg became associate chair of the department this fall, and is handling many matters including student and faculty concerns and assessment issues.

**Yu Zhang** continued working on percolation problems. He and Greg Morrow published a long paper (see above) related to the fractals of pivotal sites in critical percolation. Yu also published a paper related to the differentiability for the most right edge in the oriented percolation problem, and yet another paper (joint with Professor Yukich of Lehigh University) on the time constant in first passage percolation. Finally, Yu was awarded a prestigious two year research grant from the National Science Foundation. This is his *fourth* such award from the NSF!

**Gene Abrams** was fortunate to host a research visitor during Summer and Fall 2004. Professor Gonzalo Aranda Pino of the University of Malaga (Spain) worked with Gene on two research papers in the area of Leavitt path algebras; the two hope to continue this line of research well into the future. The topic came to Gene's attention during his attendance at a conference on C\*-algebras at the University of Iowa in June. Last May Gene was the emcee for two contests at Sky Sox Math Youth Days. This involved both an on-field context before the game (in which students answer questions in a single-elimination tournament format), and a between-innings contest in which students calculate various baseball-oriented quantities from that day's game statistics.

**Sarbarish Chakravarty** traveled significantly in the past year. He visited India in January (with his family), in addition to research-oriented visits to Ohio State University in May, and to the SIAM meeting in October 2004 in Orlando. Sarby spent some significant time in Fall 2003 and Spring 2004 developing the math department's 'Reappointment, Promotion, and Tenure' document; this document was just recently adopted by the department.

**Keith Phillips'** Christmas present for 2003 was *two new knees!* There were a few complications after the surgery, so it took a little while before Keith could 'limp' back to his teaching duties. But by April the knees were very functional. In addition to his teaching assignments, Keith also did some research in wavelet theory and other aspects of harmonic analysis.

**Seung Son** spent this past year working hard at his usual academic activity, a combination of teaching, research, and service. In particular, he spent much time working on web-material development for his courses, and for CMES. On a personal note, his parents visited him from Korea for two weeks during the summer; they saw much of the western U.S. during the visit.

**Shannon Michaux** took over the role of CU Succeed coordinator and Math 090 coordinator. The CU Succeed program helps encourage high school students to continue their math studies while in high school by offering college – level credit for precalculus. This year the program is piloting a project in which students might also get college – level calculus credit as well. She has been working on developing review materials to help students get ready for Calculus. Shannon had the opportunity to attend a workshop in Rhode Island in August; the topic was Using the Web in Mathematics.

### **Congratulations to All 2003/2004 Graduates!**

Here is the list of the Academic Year 2003/2004 graduates from each of the department's degree programs. An impressive list, to be sure!

#### **B. A. Mathematics:**

Erin Dickinson  
Elizabeth Lovins  
Deborah Arnett  
Amber Scott  
Lindsey Small  
Sheree Stuckert  
Daniel Banaszak  
Cassandra Bash

Edward Bellmund  
Jessica Degenhart  
Amy Ruckles  
Raymond Martin, Jr. (w/option in Secondary Ed)

#### **B.S. Mathematics:**

Christine Butcher  
Jessica Bartter  
Ana Fry

#### **M.S. Applied Mathematics:**

David Sheppard  
Lois Karasa  
Joyce Treulieb

#### **Master of Basic Science, Math Emphasis**

Lana Gardner

#### **Mathematics Secondary Education**

Raymond Martin, Jr.

Congratulations to all the AY 2003/2004 graduates from the Department of Mathematics!

### **UCCS Math Club**

(Editor's note: Shane Kirkbride is the current chair of the UCCS Math Club. Kristopher Marcus was chair of the club until just a few months ago. Both Shane and Kris have worked hard to help the math club become a fun, viable program!)

by Shane Kirkbride

Since the beginning of time mathematicians throughout the universe have come together to eat pizza and discuss mathematics. The tradition continues at UCCS. Twice a month on Friday afternoon those interested in math unite, eat pizza and, on occasion, discuss mathematics. Lately, the Math Club has been planning and participating in other activities as well. Despite the rumor, we are not planning to take over the world yet. However, we did go visit the Laboratory for Atmospheric and Space Physics and the Colorado University Campus in Boulder in November 2004. Throughout September and October numerous students have given wonderful presentations on those things about math our parents didn't want us to know. Programming Fractals, how Google.com works and Women in mathematics are just a few. In addition, we have been offering tutoring during Finals week. In March 2005 we are planning the first applied math conference along the Front Range. Great schools like CU-Boulder, CU-Denver, CU-Springs and CSU will all attend. Along with all these events and activities any other dirty deeds the Math Department needs done we do as well. The Math Club is a fun time; we learn a lot and

tend to have fun doing it. Our membership is free to all UCCS faculty and students. To join just show up (meeting times are posted throughout the Engineering Building), or if you want to feel official about joining the Math Club sign our mailing list at: <http://www.math.uccs.edu/mathclub/>.

## **Mathematical Contest in Modeling and the S.I.A.M. Student Chapter at UCCS**

The Math Contest in Modeling is a "fun way to acquire experience in team problem solving and apply your skills and knowledge to real world scenarios". This is how Ginger Anderson, one of the MCM 2004 team members, characterized the weekend-long Math Contest in Modeling she took part in this past February. Her team members were Amy Ruckles and Adrian Samson. UCCS teams have competed in this contest along with hundreds of peers worldwide since 1998. This contest is expected to remain an annual ritual at UCCS. The Society for Industrial and Applied Mathematics (SIAM) Student Chapter at UCCS has been created, as part of the Math Club, to promote all aspects of Applied Mathematics on the UCCS campus. Among the major events planned for 2005 is a Student SIAM Research Conference to be held on March 5th, 2005 on UC Denver campus, jointly organized with the CU Denver and CU Boulder peer Student chapters. For additional information about Math Club activities, go to the newly designed website at <http://www.math.uccs.edu/mathclub/>.

## **Incorporating underrepresented groups in math curriculum**

**By: Ginger Anderson**

(Editor's note: As mentioned above, Ranga incorporated a project in his Math 414 Fall 2004 course, in which students did independent research about a famous mathematician (current or past) for whom the pursuit of mathematics was hindered by gender or racial bias. The editor thanks Ginger Anderson for providing this description of the project. Ginger also gave a presentation to the UCCS Math Club in Fall 2004 about this work.)

In our math classes we learn concepts and how to apply them. We hear names associated with these, names such as Newton, Fermat, Poisson, Lagrange, and Gauss; those mysterious men of another age who magically developed theorems and equations useful to our study of mathematics.

In our Modern Algebra class this fall Dr. Rangaswamy assigned a group project to the entire class. The point of the project was to have students become acquainted with the people behind the names, but in particular, the women.

The main focus of our group was Emmy Noether, who labored against both gender and racial discrimination in order to exercise her talents in a capacity that would be most beneficial to the world. She fought to attain an education and be recognized foremost as a mathematician and not solely as a Jewish woman. Her determination enabled her to make significant contributions to the field of Abstract Algebra.

Using Emmy Noether as a guide we were encouraged to learn about and discuss not just other women mathematicians but those women who possessed the strength, courage, and self-respect to challenge the fixed beliefs predominantly held about women by society of their time; those women who did whatever it took to rise above what was deemed their rightful place in life as wives, mothers, and pleasant conversationalists for men and pursue their passion for mathematics.

Such a project helped us to appreciate the fact that women in general may freely pursue a career in mathematics today without the many obstacles that once kept many women from applying their talents. These women are an inspiration to us all that we may accomplish anything if we possess the desire and we persevere. May we continue to follow in our foremothers' footsteps.

## **New logo, new shirts !!**

As you may have noticed in the masthead of the Newsletter, the UCCS mathematics department has a brand new logo! The design of the new logo is the creation of math club president Shane Kirkbride. With new logos of course comes handsome new apparel! You can purchase a T-Shirt in the Math Office, EAS 274. The student price is \$15 (a bit higher for faculty and staff). Please pay Joanie Stevens by cash or check (payable to the 'UCCS Math Club'). Hurry, quantities are limited!!!