

# Aftermath

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## A Word From the Chair

by Graeme Milton

My chairmanship is now drawing to a close and it is interesting to reflect back on what has happened these last three years. I got some inkling of what the chairmanship involves when two weeks into my term we had the massive flood in LCB, which occurred the day before a large conference I co-organized was starting at Snowbird, and on top of everything my car broke down. Fortunately many people from the University and our department pitched in and helped, in particular Peter Alfeld, Nelson Beebe and Pieter Bowman, and we got through the crisis. Being confronted with crises, whether they be budget crises, staff crises, faculty crises, or building crises seems to be part and parcel with being chairman. Fortunately I am always amazed by the willingness of people to help out, and with time the crises are resolved and department life moves on.

One of the most pleasant experiences with being chairman has been getting to know our staff better. I love Annetta's sense of humor (or senseless humor as her children call it), her organization, and willingness to stay until the job gets done; Nancy's warmheartedness, sound advice (whether it be financial or otherwise) and helpful suggestions; Mary's thoughtfulness; Paula's welcoming and wonderful personality; Angie's independence and energy; Susan's attention to details; Eleen's jokes; Kathleen's drive; Heather's sense of responsibility; Vic and Pieter's helpfulness and expertise. All of them (and Nelson who continues to amaze me with his deep knowledge) are the ones who really make the department operate smoothly, and deserve our unending thanks. It goes without saying that I am extremely grateful to Associate Chairman Nat Smale, and previously Peter Alfeld, who take a lot of the load in running the department and offer friendly suggestions. I'm indebted to Alexandra Hacon and Angie Gardiner for all their undergraduate advising. Thanks also go to everyone who dutifully has served on one or more of our departmental committees, particularly time consuming responsibilities like hiring, instructorship, graduate, or executive committees. It has been great to work with you all.

We also have an excellent faculty, a fact which deserves to be more widely known. It was fantastic to see Chris Hacon and Kenneth Bromberg get Sloan Fellowships, Y.P. Lee get an AMS Centennial Fellowship, Jim Keener become Distinguished Professor, and Fred Adler and Elena Cherkayev become Full Professors, with many other promotions expected this year. Of course we were sorry to see Herb Clemens, Misha Kapovitch and Grisha Mikhalkin leave, and have Les Glaser, Hugo Rossi, Dave Mason and Fletcher Gross retire. On the other hand it is very pleasing to see the success we have had with hiring in the department this year, filling long standing needs in Probability, Numerical Analysis, and Mathematical Biology with the outstanding hires of Firas Rassoul-Agha, Jared Tanner and Alla Borisjuk, and on the pure side, getting an Algebraic Geometer, Tomasso de Fernex, and a Commutative Algebraist, Anurag Singh, both of whom are exceptionally talented. It is doubly rewarding to see the John E. and Marva M. Warnock Presidential Endowed Chair for Faculty Development in Mathematics filled after so many years not just by one gifted individual, but by two: Tomasso de Fernex and Jared Tanner who will hold it jointly. Also with the hire of Alla this year and

Elena last year, we have tripled the number of our tenured or tenure-track women faculty, an increase in diversity which will have long term benefits for the department, particularly in inspiring female students to become mathematicians and in attracting additional women to our department.

It is wonderful to see how successful our mathematics student center has become thanks to Angie's efforts. Our architecturally inspiring LCB building has made us the envy of mathematics departments across the country: I know of no other that has such a stunning building. The Dumke loft is now the capstone on that achievement providing not only a place for our first year graduate and REU students, but also a place to grab a coffee and lounge back and read a mathematics book, study at a table, or hold a discussion on the latest research problem. Also it is terrific to see the impact that our VIGRE, IGERT, RTG, FRG, and many other individual investigator grants are having, leading to a flourishing of activity within the department.

I'm delighted that Aaron Bertram is taking over the chairmanship, not only because he relieves me of the responsibility, but more importantly because I think he will do an excellent job in handling the challenges that the department will no doubt face, and in continuing to foster the growth of the department, in reputation of research and teaching, and quality of our faculty, staff and students.

I wish everyone a great summer and coming academic year.

## Greetings From Your Next Chair

by Aaron Bertram

As many of you already know, I will be taking over the job of chairman of our department from Graeme Milton on July 1. While the dean was busy twisting my arm, he told me that I had broad support from my colleagues, and I confess that this support was a major factor in convincing me to accept the responsibility of the chairmanship. This is because in taking on the job, I realize that I will be leading a diverse community of students, staff and faculty, who play many different roles with many different, and sometimes conflicting, needs. It is a department where I have always felt happy, and which I am proud, if somewhat nervous, to lead. I am looking forward to working closely with all of you to see what we can do together to make our terrific department even better.

I am very grateful for all the hard work that Graeme has done, and especially for his unwavering kindness and devotion to the well-being of every member of our department. By leading us to a spectacular year of hiring and the awarding of the Warnock chair, Graeme is certainly ending his chairmanship with a flourish. Many thanks, Graeme, and I hope you enjoy your well-deserved return to life as a full-time mathematician!

## Degrees Awarded

This year approximately 40 undergraduate math majors will receive a baccalaureate degree and a total of 26 Masters degrees will be awarded by the math department. Students receiving the Ph.D. in 2004-2005 are Renzo Cavalieri, Stefanos Folias, An Hai Le, Young-Seon Lee, Fumitoshi Sato, and Kazuma Shimomoto. Congratulations to all our graduates!



# Retirements

Professors Fletcher Gross and David Mason are retiring at the end of this academic year. Between them they served the University of Utah for 74 years. Both of them have been a fixture in our department for several decades, as teachers, as researchers in their fields, and in various capacities in the administration of the department and the University. Of course no short article like this can do justice to their many contributions over the years. Its only purpose is briefly to mark this major milestone in the history of our department.

Fletcher obtained his Ph.D. in 1964 from Cal Tech. After spending two years at Occidental College in Los Angeles, and two more at the University of Alberta, he joined our department in 1967. He served as associate chair for five years, advised two Ph.D. students, and distinguished himself as a popular and highly successful teacher. Retirement hardly means that Fletcher will slow down. He and his wife Sally (a nurse) are retiring together. They plan to stay in Salt Lake, close to their son and his three children. They also have a daughter in Virginia, and another son in Seattle, so they will be traveling a fair bit. Fletcher likes to play competitive chess, but not as much as golf. His goals are to regain his masters status in Chess, and to reduce his Golf handicap to the single digits. He will even continue to teach classes for us, in fact without a break this very Summer, but only the fun ones, and only if it fits into both his and the department's plans.

Dave obtained his Ph.D. in 1968 from UC Riverside. Before coming here in 1971 he spent several years at the University of Georgia. Dave was one member of a small group in our University who, in the seventies, established the University's MStat program. The program was approved by the board of regents in 1975, and it started operating in 1976. It is still going strong. Typically there are 30-35 students enrolled at any one time, including 5-10 in the Math Department. Students take half their courses in mathematics and the other half in their discipline. Dave plans to continue his statistical consulting business, and to travel extensively in the near future, including to Spain, Morocco, and Thailand. In August he is going to take his 13 year old granddaughter to an archaeological dig in the four corners area. He is still advising one Ph.D. Student, Renate Casper, who will probably finish in December. He may also teach a few classes for us in the future, but right now his schedules seems just too busy for that.

We thank both Dave and Fletcher for their services and dedication, and wish them well in their retirement. There will be a party in their honor, on Tuesday, April 26, at 3:00 pm in the departmental lounge.

# Undergraduate Research

by Ira Burton

Recently I completed work on a mathematics REU project under the fine direction of Grady Wright. The project was an attempt to apply concepts from the area of Artificial Neural Networks (ANNs) to a simplified version of the betting game of Blackjack. After becoming familiar with the mathematics commonly employed when implementing ANNs I created a generic MATLAB ANN toolbox.

I then used the toolbox to implement an artificial blackjack player that would compete against another player who played strictly by a set of rules commonly referred to as "basic strategy". The ANN player had no built in knowledge of any betting strategy and was forced to learn as it played. After several thousand iterations the ANN based player showed a marked improvement (however not enough that I would allow it play with my money!)

The project used many of the concepts that I have gathered from Linear Algebra, Statistics and especially Scientific Computing classes at the U. It was a great experience to use the concepts I have acquired in these classes on real world problems.

# Personality!



Lyubima Simeonova, a graduate student studying applied mathematics, always gets a bit emotional when talking about her family. Although she has lived away from them for seven years, she has yet to overcome the nostalgia that overwhelms her when she thinks about home. Her family has always believed in her, and having this unconditional love and support has given her the courage to go for her aspirations. Lyubima's mom taught her to smile at the whims of fate and to believe that the future is even better, wiser, and more potent than the present. Her father, Botio Simeonov, works for the Bulgarian military, and her mother, Sofia Simeonova, is a nurse. She has a brother, Ivan Simeonov, who is a sophomore at Eastern Oregon University.

Lyubima loves skiing, and every time she goes to the slopes she falls in love with Utah again, as she did the first time she visited. She has recently found a new obsession – Capoeira. It is a martial art developed by the slaves in Brazil. Disguising their training as a ritualistic dance, the capoeiristas throw spinning kick and head butts, narrowly missing their opponents, who counter with acrobatic retreats that suddenly change from defense to attack. Onlookers sing, clap their hands, and play drums to the rhythm of the berimbau, a one-stringed bowlike instrument. The lyrics of the songs speak of happier life and freedom. Unlike the typical martial arts that emphasize control and discipline, Capoeira is frenzied, cheerful, unpredictable, and exhilarating. Lyubima also likes to watch boxing. Her brother used to box before he came to the U.S. despite her parents' appeals to stop, and she contracted his enthusiasm for the sport.

You may not know that Lyubima is skilled in palmistry, which she learned from the gypsy women in Bulgaria. So if you have five bucks to spare and you desire to learn what mysteries the future holds for you, stop by and let her look at your palm.

## Just For Fun...

There are three kinds of people in this world – those who can count and those who can't!

## VIGRE – Summer 2005

by Klaus Schmitt

The Department's NSF VIGRE grant is approaching the end of its fourth year of operation and much has been accomplished during this period. After this summer there will be one more year of VIGRE support left to the Department and another group of new graduate students will be supported for a year, as will there be another new VIGRE assistant professor arriving for the autumn semester.

During the summer there will be the usual set of activities taking place. They are the following:

- May 16-27: Mini-course *Arc Spaces and Motivic Integration*, organized by Aaron Bertram and Christopher Hacon with lecturers from Essen, Michigan, Toronto, and Leuven.
  - May 16-27: Mini-course *Nonconvex Variational Problems and Applications*, organized by Elena and Andrej Cherkhaev with lecturers from Rome, Maryland, and our own Department.
- VIGRE assistant professor Michael van Opstall will be assisting in the first and Burgess assistant professor Marian Bocea together with VIGRE graduate student Nathan Albin will be assisting in the second mini-course. Graduate students from our own department as well as from other schools will be participating.

- June 6-July 15: Summer REU program *The Mathematics of Games of Chance*. The program has been organized by Stewart Ethier, who will be assisted by VIGRE graduate students Berton Earnshaw and Lars Louder. There were 24 applicants of which 10 were selected. Five of those are from Utah and five from out of state, coming from MIT, Duquesne, Cornell, Berkeley, and Rutgers.
- June 13-30: The Summer Mathematics Program for High School Students will be conducted by Jim Carlson and Angie Gardiner. This year's main topic is *Number Theory* with other topics reserved for some afternoon sessions. Angie and Jim will be assisted by Maria Bell (former graduate student), Matthew Clay and Russell Richins (VIGRE graduate students), and Tim Simmons (undergraduate). The program has become very popular and competition for the available slots has been keen, with several students from out of state in the applicant pool. There will be approximately 20 students selected; for those from away, families are still sought which are willing to house the students for the duration of the program.
- June 13-July 29: The summer *ACCESS* program, a program for talented entering freshmen women science students, has been run by the College of Science for more than a decade (and has been supported by VIGRE since the beginning of the grant). The Mathematics portion of the program will (as before) be run by Nick Korevaar who will be assisted this year by VIGRE graduate student Sarah Kitchen.
- There will be six summer REU individual projects available for support. The application deadline for participating in this program is May 20.
- As in previous years there will be preliminary examination study help sessions arranged for those graduate students who will sit for their examinations come August.

The VIGRE grant has had considerable impact on all of the department's programs. It can be argued that the changes that occurred because of it have been good ones and that these changes are to be sustained and even amplified. To be able to accomplish this, a new team, under the leadership of Aaron Bertram and David Dobson, is preparing a proposal to NSF to obtain VIGRE funding for another five year period. This committee needs the support of the faculty as a whole and most certainly would welcome input and help from all to make the new proposal a very successful one.

Additional information about the VIGRE program may be found at <http://www.math.utah.edu/vigre>. You may also contact our program coordinator Kathleen Kerr ([kerr@math.utah.edu](mailto:kerr@math.utah.edu)) or myself at [schmitt@math.utah.edu](mailto:schmitt@math.utah.edu) about the various facets of VIGRE at Utah.

## Undergraduate Contests

The sixth annual Calculus Challenge was held Saturday, April 9. Eight students participated in this three hour exam that consisted of six very challenging calculus problems. Hao Wang took first place, Quynhhoa Nguyen took second place, Christopher Calaway took third place, and Spencer Bagley earned an honorable mention. We'd like to give a huge thanks to Sarah Kitchen and Pejman Mahboubi who organized and carried out this event.

Our annual Undergraduate Problem Solving Contest wrapped up this week, with Aaron Wood being named the winner. There were seven problems this year, and the competition was stiff. Several students submitted solutions each month, and we hope that all enjoyed working the problems. Thanks go to Mark Thomas and Dan Margalit for facilitating this contest. Good luck to Aaron and Mark when they participate in the national finals in August.

# IGERT Recruitment

by Heather Rasmussen

The IGERT Mathematical Biology Graduate Program held its first annual recruitment weekend during the last Friday and Saturday of February 2005. A full day of interviews, meetings, and classes awaited the eight candidates who were in attendance on Friday. Saturday was a free day with options to ski, snowboard, cross-country ski, or tour the town. The day ended at the cabin of Jim Keener. The following Monday, two additional candidates endured interviews, meetings, and classes.

Overall, the process went very smoothly and we are hoping to fill several of the eight offered positions. The program received a total of 19 applications for the 2005-2006 academic year. Of those, we offered interviews to 11, all of whom accepted to come and interview with the Mathematical Biology Professors and Jingyi Zhu, Graduate Program Director for the Department. We hosted eight total candidates from out of state and three from the University of Utah. One candidate participated in the Department's annual recruitment weekend held the first weekend of April 2005.

We would like to thank those who participated in the planning and execution of the recruitment weekend, as well as to those who hosted the out of state candidates in their homes.

## Faculty Changes

We will have several changes to our faculty this next year. Fletcher Gross and David Mason are retiring, Graeme Milton and Dragan Milicic will be on sabbatical, Jim Carlson will still be on leave at the Clay Institute, and David Levin will be leaving. Coming on board as new faculty will be assistant professors Alla Borisyuk, Tommaso De Fernex (who will be on leave next year), Firas Rassoul-Asha, and Jared Tanner (who will also be on leave next year). Anurag Singh (who we are happy to welcome back) will be a new associate professor, and Jason Behrstock will be a new assistant professor (lecturer). We will also be welcoming two RTG postdocs, Samuel Issacson and Jonathan Forde.

In addition to these comings and goings, Elena Cherkaev and Shekhar Khare will receive tenure, and Ken Bromberg, Christopher Hacon, and Peter Trapa will receive promotion to associate professor with tenure. Congrats!

