Aftermath

Greetings From the Chair

Aaron Bertram
I hope you all had a productive summer and are enjoying the start of the new academic year. Although the fall has finally arrived, all the new faces make it feel like spring each year at this time. Greetings to Dan Ciubotaru and Kevin Wortman, who join our Representation Theory and Topology groups, respectively. Welcome back to Emina Alibegovic and Michael Van Opstall who have joined our Mathematics Education team. Greetings to all the new postdocs and graduate students, and to Patti Dunn in the front office!

As many of you already know, on October 18-19 the Mathematics Department will be visited by a committee of evaluators (Mark Green, Eitan Tadmor and Karen Vogtmann) as part of the University's septennial review of our graduate program. This is a real opportunity for us to communicate our concerns to the administration, so please take some time between now and then to think about this visit.

As I gathered data for the committee visit, I was struck by how well we are doing. Here are some highlights. Thanks to our continuing departmental VIGRE grant and the IGERT, RTG and Gels grants held by the Math Biology group, the numbers of graduate students are way up, and our undergraduate numbers are also way up compared with seven years ago. One third of the tenured/tenure track faculty has turned over since the last review, and as a result we are quite a bit younger now than we were in 2000. Two thirds of our tenured/tenure track faculty hold individual research grants, including *everyone* hired in the past fifteen years. Ours is an extraordinary department, and it is a privilege to serve as your chair. Have a great year!

Welcome!!

We'd like to extend a warm welcome to those who are new in the department this year and we hope they feel at home here.

Our new faculty members are Dan Ciubotaru (Topological/Lie Groups) and Kevin Wortman (Geometric Group Theory). New postdocs and research associates are Jeff Blanchard (Fourier Analysis), Christopher Cashen (Group Theory), Jian Du (Numerical Analysis), Robert Easton (Algebraic Geometry), Fernando Guevara Vasquez (Partial Differential Equations), Siegfried Hörmann (Statistics), Yunfeng Jiang (Algebraic Geometry), Julien Paupert (Geometry), and Damon Toth (Math Biology).

There are also some familiar faces among the "new" this year. We are excited to have Emina Alibegovic back with the department as part of the math education group, and to have Berton Earnshaw (Math Biology) and Michael van Opstall (Algebraic Geometry) back in new positions this year, as assistant professor (lecturer) and associate instructor in math education respectively.

We will have a few visitors with us this year. Those currently here are Alfred Chen, who is visiting Christopher Hacon for the academic year, and Ionut Ciocan-Fontannine, who is visiting Aaron Bertram this fall.

Our new graduate students are Victor Camacho, Davide Fusi, Mizue Horiuchi, Masaki Iino, Brian Knaeble, Christopher Kocs, Ching-Jui Lai, Ross Magi, James Moore, Andrew Nelson, Clarice Nelson, Paul Porter, Nathan Rickett, Ben Trahan, Stefano Urbinati, Xu Wang, Aaron Wood, Chris Bosley, Yunhye Chu, Tony Lam, Lin Li, and Sandy Schaefer. We would also like to welcome Jheng-Jie Chen, who is a visiting student of Alfred Chen.

Please don't hesitate to ask someone if you aren't sure how things work around here. Paula Tooman in the department office is extremely helpful.

Meeting of Nobel Laureates
Giao Huynh

During the first week of July 2007, I had a great opportunity to attend the 57th Meeting of Nobel Laureates. This annual meeting takes place in Lindau, Germany. This year, the meeting was dedicated to the Laureates in Medicine and Physiology.

Meeting a Nobel Laureate would be a great experience for many people. Having the opportunity to meet and talk to 16 of them is a lifetime experience. I was quite impressed to see how humble they are and their interest in interacting with students and young researchers like us. Talking to them and being involved in their discussions has given me extra inspiration to work harder and advance in my career.

My research interest is modeling the infections of virus and bacteria inducing cancers, focusing on the Epstein-Barr virus infection. Hence, I especially enjoyed the lectures given by Dr. Hunt, Dr. Ciechanover, and Dr. Zinkernagel. These lectures gave me more knowledge on cancer development, and how the immune system works within the body. I attended discussions with Dr. Mello, Dr. Ciechanover, Dr. Blobel, and Dr. Zinkernagel. The 'Bazaar' session with Dr. Ciechanover stood out among them for different reasons. He acknowledged that the group involved people from different fields in the sciences and he tried to make sure everyone understood the questions, concepts and ideas that were brought forward for discussion. Dr. Ciechanover won the Nobel Prize in 2004 for his study on the ubiquitous system. During discussion, he provided examples on viruses that can manipulate the ubiquitous system within our bodies and the Epstein-Barr virus was the most sophisticated virus in his opinion.

Besides great meetings with the Nobel Laureates, I also loved the interactions with other students and young researchers at the conference. At this year's conference, there were more than 500 young researchers from different parts of the world. During lunches and dinners, we had great discussions on a variety of topics, including the differences in education systems between countries, collaborations between different fields in the sciences, economics, and sports.Overall, I would certainly recommend this experience to anyone.

JPK60 Conference Honors Jim Keener
Alla Borisyuk

A conference to celebrate Jim P. Keener's 60th birthday, titled JPK60, took place on May 25-26, on campus. Jim's former students and colleagues gave research talks peppered with Keener-stories. Speakers included Bob Guy (Utah), Eric Cytrynbaum (UBC), Bard Ermentrout (Pittsburgh), Leon Glass (McGill), Brynja Kohler (Utah State), Mark Lewis (Alberta), Eric Marland (Appalachian State), Alex Mogilner (UC Davis) and John Tyson (Virginia Polytechnic).

A banquet was held on the evening of May 25 at Cucina Toscana with great food, toasts and well-wishing. The conference closed on Saturday afternoon with a hike, led by Keener himself, followed by a barbeque outing at Sunnyside Park.

Wasatch Toplogy Conference
Kevin Wortman

The twenty-fifth semiannual Wasatch Topology Conference was held Aug. 11 - 13 at the University of Utah. Jointly sponsored by Brigham Young University, the University of Utah, and the NSF, the conference was organized by Mladen Bestvina, Ken Bromberg, Greg Conner, and Kevin Wortman. The speakers were Matt Bainbridge (U of Chicago), Nathan Broaddus (U of Chicago), Kai-Uwe Bux (Virginia), Jim Conant (UT Knoxville), W. Patrick Hooper (Northwestern), Dan Margalit (Utah), Jessica Purcell (BYU), and Anne Thomas (U of Chicago).

Participating from UU were Domingo Toledo and Julien Paupert. The conference also included a picnic held at Mill Creek that was enjoyed by all.

Mini-course on Derived Categories
Y. P. Lee

Over sixty mathematicians and physicists, including twenty-four VIGRE-funded graduate students, attended the two-week derived categories minicourse from June 4 - 15, 2007 at the University of Utah. The aim of the course was to introduce graduate students to derived categories, and to explore recent advances, including the role of derived categories in mirror symmetry and its appearance in string theory. The minicourse was organized by Aaron Bertram, YP Lee, and Eric Sharpe and consisted of daily

lectures on topics related to derived categories, as well as a few introductory lectures on other subjects such as toric varieties. The lecturers were Andrei Calderaru (Wisconsin-Madison), Alastair Craw (Glasgow), Richard Thomas (Imperial College), Patrick Clarke (UPenn), Arend Bayer (Utah) and Eric Sharpe (Utah). Excellent lecture notes and videos of the lectures are posted on the minicourse web site. Lectures were augmented by daily and evening problem sessions, which were also extremely well attended. Mixing physics and math participants worked quite well, given the topics of the minicourse.

In addition to the VIGRE grant, funding came from MSRI and NSF covering several physics participants. The minicourse was jointly sponsored by the MSRI as one of its Summer Graduate Workshops. Kathleen Moore did an excellent job in making this extraordinarily large mini-course run so smoothly.

Roughly a dozen mini-course participants also participated in a follow-up AMS Summer Research Conference at Snowbird from June 17-21, 2007 on Derived Categories in Mathematics & Physics.

Mini-course on Delay Differential Equations

The mini-course on delay differential equations, held at the University of Utah, June 25 - 29 was organized by Jon Forde. Lectures focussed on practical applications of systems of delay differential and partial differential equations to biology, population ecology, chemistry, optics and traffic modelling. Theoretical and computational issues were also addressed. Lectures were given by Yang Kuang (Arizona State), Stephen Gourley (Surrey), Thomas Emeux (Universite Libre de Bruxelles) and Jon Forde. The course was attended by our math biology and biology grad students as well as a student from Duke and a postdoc from Stanford. This course was funded by the Department's NSF-VIGRE grant and the NSF-RTG in Mathematical Biology.

Summer Mathematics Program for High School Students
Matt Housley
Mladen Bestvina directed the Summer Mathematics Program for High School Students this year. He was assisted by undergraduate Kyle Steffen, an alumnus of the program, as well as graduate students Matt Housley and Casey Johnson. Fourteen students participated, thirteen from parts of Utah and one from the U.S. Virgin Islands.

Students learned about various areas of number theory and its applications including Diophantine

Equations, primality testing and RSA cryptography; they also studied the classification of knots, graph theory and basic probability. They applied their mathematical knowledge through Python programing in afternoon computer labs. Students were exposed to other areas of mathematics through daily colloquia given by professors in the department: Peter Alfeld, Emina Alibegovic, Aaron Bertram, Jim Carlson, David Dobson, Stewart Ethier, Ken Golden, Jim Keener, Domingo Toledo, Peter Trapa, and Kevin Wortman. A few of the topics were hyperbolic geometry, the mathematics of Google and the Six Degrees of Kevin Bacon. Many thanks to those who participated.

At the end of the program, students had the opportunity to give their own talks on various topics such as magic squares, Catalan numbers and the four color theorem. On the last day, there was an informal exam in the form of a game of Jeopardy.

Problem Solving Champion
Carlos Gamez
(*Carlos took second place at the national undergraduate problem solving competition. Way to go Carlos!*)

The "U.S. National Collegiate Mathematics Championship" took place on August 5th in San Jose, CA. It is a 45-minute time based competition that consists of 7 problems. Every time a student arrives at a solution, he must circle it and lift his hand in order for his solution to be checked. If the solution is right the following problem is given, otherwise the student is told to "keep working." The winners are selected on the basis of how far they get. In my case, I was able to successfully solve 6 out of the 7 problems, therefore arriving at the last problem. The exam is administered by the American Association for Mathematics).

ACCESS Program
Nick Korevaar

This College of Science program encourages young women to pursue scientific and engineering careers by providing them with mentoring and support structures at the very start of their college experience. High school seniors who are admitted to the ACCESS cohort receive a stipend, participate in a novel eight-week, half-day program during the summer before their freshman year, and are placed with a research mentor during the spring of their freshman year. Nick Korevaar led the two math weeks this summer, along with math graduate students Jen Guajardo and Meagan McNulty, who was also the TA for the entire eight week program.

The first math week's focus was secret codes, especially the number theory behind RSA public key cryptography. A guest presentation by biologist Jon Seger about how the genetic code was cracked provided a nice counterpoint. Students created a mini-RSA system and sent secret messages to each other. During the second week the focus was mathematical scaling laws and fractal geometry, with students using MAPLE to create their own fractals. Meagan gave a presentation about how our own internal mammalian tree structures have been proposed as the explanation for a famous and surprising empirical scaling law in biology, that metabolism scales like mass to the 3/4 power, for mammals from shrew to whale.

Our Departmental VIGRE grant supports three energetic, assertive and talented ACCESS women each year, and we hope to place about that many of the current cohort with Math faculty mentors this coming spring.

Fall Social at Alta Lodge
August 25, 2007

Liang Zhang (standing), Jian Du, Linjia Wu, Li Li Chen, Yunfeng Jiang

Jennifer Guajardo, Tony Vinton, Lajos Horvath, Siegfried Hörmann, Tina Obermoser

Kathleen and Dan Margalit, Kevin Wortman

Paul Bressloff, Aaron Fogelson, Debbie Feder, Hermine Testard, Alessandra Angelucci

Amber Smith, Dane Maxfield, Tabitha deLeeuw