

A f t e r m a t h

edited by Peter Alfeld and Paul Roberts

This issue of the aftermath looks different than all the preceding ones because Angie Gardiner, who has been editing the aftermath for many years, is on maternity leave. Little Abigail Lucy Gardiner was born on August 10. We talked with Angie. Mother and child are doing well. Angie said her daughter is just so sweet, and having her is the greatest thing Angie has ever done. Abigail does not yet know Calculus, but her grandfather has been trying to teach her the preamble of the constitution.

If you are new in our department you don't know how deeply Angie is involved in many central parts of our affairs. In choosing this format we are trying to make sure that you look forward to her return as much as we are!

From the Chair

by Aaron Bertram

To paraphrase Tolstoy, all healthy mathematics departments resemble one another, but each unhealthy department is unhealthy in its own way. The general perception in the mathematics community is that ours is a very healthy department, featuring excellence in research across many disciplines, highly respected and well-funded post-doctoral and graduate programs, large and growing pool of undergraduate mathematics majors, and careful attention to the teaching of our "service courses." In other words, our faculty are not just top-notch mathematicians, but many of us are also excellent teachers with a strong sense of civic responsibility.

Nevertheless, the second year is supposed to be the year when a chair thinks about "what needs to be done." Here are a few areas where I think there is room for substantial improvement:

Faculty Participation in Key University Committees

Before we can accomplish anything requiring additional resources, the administration needs to be aware of our qualities and our needs. In other words, we need more lobbyists. In my own conversations with administrators, I have been surprised at the general level of misinformation, and the lack of awareness of the strengths of our graduate program as well as the effectiveness of our Rushing Center.

Statistics

We need to make a strong tenure-track hire in the area of Statistics. In the long term, what we really need are

resources from the administration to create a Statistics group that is large enough to meet the growing outside demands of the University. Whether this group is within our department or external to the department is up for debate, but we cannot meet these demands ourselves without additional funding.

Math Education

Our math education program is small (compared to Utah State or BYU) but of a very high quality. Ideally, this program is administered in partnership with math educators out of the Teaching and Learning department, but they have had difficulties maintaining their math education group. The retirement of Anne Roberts makes the problem worse. We need to find someone to fill Anne's role, who can also partner effectively with the Education school.

The Undergraduate Major

The increased interest in mathematics among our undergraduates is both gratifying and challenging. We have a real opportunity here to provide our undergraduates with a quality background in mathematics, but to do so, it is clear that some changes should be made to the math major. Ken Golden is chairing the undergraduate curriculum committee to develop a major for the 21st century.

The Graduate Program

Our major challenge continues to be recruitment. We have a graduate recruitment committee this year, charged with finding creative ways to lure top graduate students into our program. In another direction, we need to address the fact that some of our applied mathematics graduate students go through a program that is significantly different than our standard PhD program in mathematics. To this end, the graduate committee will be asked to develop a PhD in Applied Mathematics.

Distinguished Visitors

by Paul Roberts

János Kollár and Jennifer Johnson are visiting our department this semester. They were on the faculty at Utah from 1985 to 1999, at which time they obtained positions at Princeton University. János is on sabbatical this year.

When asked why they decided to come to Utah, János replied that there were several considerations. For one thing, they had good memories of the time they spent

here, and this would be a real change from Princeton. Also, this gives him a chance to catch up on what is happening in the Algebraic Geometry group here.

Their daughter Alicia is starting college at Princeton this semester.

They will be at the University of Texas at Austin during the remainder of the year.

Mini-Course on Stochastic PDEs

by **Kathleen Moore**

Davar Khoshnevisan and Firas Rassoul-Agha organized a mini-course on Stochastic Partial Differential Equations from May 8 to May 19, 2006. There were fifteen participants. Lectures were given by Robert C. Dalang (Ecole Polytechnique Fédérale de Lausanne), Davar Khoshnevisan (University of Utah), An Le (Utah State University), Carl Mueller (University of Rochester), David Nualart (Member of Barcelona's Academy of Science; Universities of Barcelona and Kansas), Boris Rozovsky (University of Southern California), and Yimin Xiao (Michigan State University).

A complete list of participants, lecture abstracts and notes are available at www.math.utah.edu/spde.

Mini-course on $SL_2(\mathbb{R})$

by **Peter Trapa**

Over fifty participants completed the two-week $SL_2(\mathbb{R})$ mini-course from May 21 to June 2, 2006. The mini-course was organized Bill Casselman (University of British Columbia), Dragan Milicic, and Peter Trapa. The course consisted of nine days of four hour-long lectures by the organizers; in addition, student problem sessions were conducted each evening. Because of the large number of participants, the organizers secured extra funding from MSRI. (In fact, the minicourse was jointly billed as an MSRI Graduate Summer Course.) As a follow-up to the mini-course, roughly thirty of the participants registered for an AMS conference at Snowbird celebrating the birthdays of Casselman and Milicic.

Kathleen Moore and the organizers continue to maintain an $SL_2(\mathbb{R})$ website. It contains notes related to the course, mp4 videos of each lecture, and even the anonymous student evaluations participants submitted. (An example of the latter: "Trapa's lectures are like 'The Muppet Show', with the two old men always making snide comments.") The website continues to receive many hits weekly.

The idea of a longer mini-course leading up to a higher-level conference at Snowbird proved to be quite successful. Indeed, Aaron Bertram and Eric Sharpe

are planning a similar undertaking (devoted to derived categories) for the Summer of 2007.

The Geometry of Moebius Transformations

by **Jason Behrstock**

During Summer 2006, Jason Behrstock assisted by Lars Louder and Dan Margalit, ran a group REU program on "The Geometry of Mobius Transformations." This program was a great success! The participants included six undergraduates from other institutions (ranging from small liberal arts colleges to top research schools), one local undergraduate, and one local masters student.

The program was three weeks long and was divided into two sections. The first section was a crash course in Mobius transformations, and included approximately 4 hours of daily lectures in which everyone participated, plus, as interests dictated, additional informal meetings in smaller groups often led by Behrstock or Louder. In the second half of the program there were regular daily meetings in the computer lab where the participants worked towards implementing various parts of the theory developed in the first half. In this part, everyone worked towards the goal of being able to successfully produce a picture describing some aspect of the geometry of Mobius transformations. Different students worked towards varied manifestations of this and in the end everyone succeeded in producing beautiful pictures. As a pleasant surprise, some of the students with the least prior computing experience were the most prolific in the production of successful computer programs!

As a fringe benefit of the success of the program, several of the students expressed interest in graduate work at the University of Utah.

New Faces

New and visiting faculty this year include Arend Bayer, Hailong Dao, Tommaso deFernex, Mohammud Foon-dun, David George, Troy Goodesell, Jennifer Johnson, Krzysztof Klosin, Piotr Kokoszka, János Kóllar, Eulalia Nualart, Peter Roper, Tatyana Sorokina, Jared Tanner, Razvan Veliche.

We also welcome new graduate students Brittany Bannish, Elijah Bogart, Erica Graham, Jennifer Guajardo, Adam Gully, Zsuzsanna Horvath, Matthew Housley, Loc Hoang Nguyen, Peter Marcy, Erika Meucci, Jeremy Morris, Jay Newby, Matthew Reimherr, Christopher Remien, Joshua Shrader, John Tate, Darci Taylor, Jianyu Wang, Liang Zhang, and Dylan Zwick, and visiting graduate students Shinpei Baba, Davide Fusi, Chenyang Xu, and Amit Hogadi.