

Math



Times

Department of Mathematics

Spring 2006

Letter from the Department Chair

This spring has ushered in the changes in the world outside that are near and dear to us all; the annual miracle of the greening of the earth can make an optimist of the greatest pessimist. This spring has also brought other changes. After a year and a half of hard work, Professor Daniel Grayson has resigned from his administrative role as chair of our department. We are searching for a new chair of the department. In the meantime, Dean Sarah Mangelsdorf asked me to serve as Interim Chair, a job that I agreed to do knowing how much I wanted to support our truly wonderful department, even though taking up this task would require me to at least temporarily stop the enjoyable work that I had been doing.

Our department is undergoing a metamorphosis. While most of our colleagues who have been teaching and doing research here for years are still around, many of them have retired in order to focus their time on what they really most want to do. At the same time, many new faculty members have joined our ranks in the last ten years. The balance of research interests among our faculty members is shifting. More and more we see interdisciplinary work being the focus. By this I mean both research that is interdisciplinary in linking mathematicians with engineers and scientists to create new paradigms of how the mathematical sciences can be applied, and also interdisciplinary in the creative regrouping of traditional mathematical fields and techniques into new amalgamations that can yield striking progress in answering difficult and important mathematical questions.

At the same time, our undergraduate student ranks have grown with first year student enrollment increases, leading us to teach a greater number of large classes and also to reorganize our curriculum on many fronts. Our Actuarial Science Program has grown to 270 undergraduate students and 25 graduate students now majoring in this specialization. The number of our graduate students is fairly steady, but the breadth of interests and directions of the careers of our graduate students continues to evolve.

It is an old saying that change is inevitable. But I believe that what will emerge in the future as a result is not inevitable. The outcome will depend on us.

Our department is thinking hard about how it can effectively govern itself, using the chair system to its greatest impact and advantage. We are also asking ourselves how we can best evaluate our research and teaching, seeking to determine what the criteria are that can adequately measure faculty potential, given the increasing focus on interdisciplinary research and collaboration in the mathematical sciences. These intertwined themes of governance and evaluation present us with many challenges. However, they cannot be dealt with once and for all. They will require us to respond with constant attention, flexibility, and renewed energy as the decades go by.

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The Math Times is published twice a year by the Department of Mathematics at the University of Illinois at Urbana-Champaign. The *Math Times* is available via the web in pdf format at www.math.uiuc.edu/mathtimes/.

If you would like to receive e-mail notification when a new issue is released, please send an e-mail to mathtimes@math.uiuc.edu. Hardcopies of the newsletter will be mailed upon request.

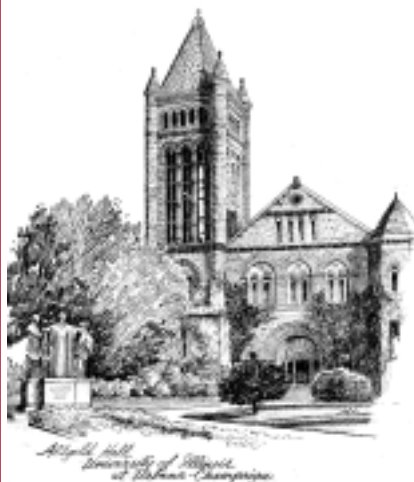
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Letter from the Department Chair, continued

We need your help in this process! Take a look at the breadth of our programs. Ask yourself what you can do to support us. For instance, there is a critical need for funding to support research experiences for undergraduate and beginning graduate students. We sorely need fellowship funds to allow our best and brightest graduate students time to focus exclusively on their research work. We particularly need to identify sources of such funding because our NSF VIGRE grant is ending and other fellowship funds, like the GAANN grants, are proving to be hard to obtain. Moreover, our library, both the traditional archive and the ever more important electronic archive, needs your support to keep it being one of the very best mathematical libraries in the world.

The issues facing our department, and also facing our campus more broadly, are not easy ones to handle. But I know that our department will be able to work effectively to make progress in dealing with these questions. So, with this expression of optimism and hope, as spring matures and summer comes, I wish you all good health and prosperity. May the sun shine on your faces and the wind be at your back.

Sincerely,

Joseph Rosenblatt
Interim Department Chair

On-line giving

Today, more than ever, the Department of Mathematics relies on the financial support of its alumni and friends. And now we've made giving even easier with online giving! Visit the department's homepage at www.math.uiuc.edu and click the "Give Online" icon. A complete list of available funds with descriptions can be found there.

There are many different ways that you can support the department in its educational and research missions through student fellowships and scholarships, prizes and awards for students, support for the library, or funds for maintaining Altgeld Hall. Giving in support of these and other important missions truly makes a difference by promoting excellence in the UIUC Department of Mathematics.

Ghrist to lecture at 2006 ICM

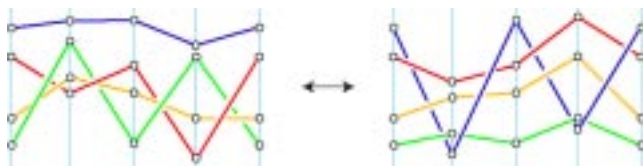
Robert Ghrist has been invited to deliver a section lecture at the 2006 International Congress of Mathematicians (ICM) in Madrid, Spain. Ghrist is an Associate Professor of Mathematics and a Research Associate Professor in the Coordinated Science Laboratory at UIUC. His 1995 Ph.D. in Applied Mathematics from Cornell University was preceded by a 1991 B.S. in Mechanical Engineering from the University of Toledo, Ohio. He has held positions at the Georgia Institute of Technology, the University of Texas, Austin, the Institute for Advanced Study, and Princeton University.

Professor Ghrist's research is in "Topological Methods in Applied Mathematics." The theme of Ghrist's work is that beneath many common systems arising in engineering or computer science applications, there lies a hidden richness of geometric and topological structure, waiting to be discovered and exploited. By elucidating this structure, one sets up a bridge for 'technology transfer' from Core Mathematics to Core Applications.

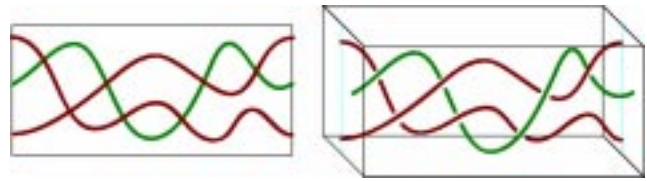
Examples of this technology transfer in Ghrist's work include:

1. Using the topology of knots and links to classify periodic orbits of differential equations;
2. Using geometric group theory to coordinate reconfigurable systems ranging from metamorphic robots to protein chains;
3. Using symplectic and contact topology to force hydrodynamic instability in inviscid fluid flows;
4. Using Alexandrov geometry to solve pursuit-evasion problems on complicated, non-convex domains;
5. Using algebraic topology to solve global problems in sensor networks without localization.

The work that Ghrist will be speaking about at the ICM is a joint project with R. Vandervorst [VU Amsterdam]. In this project, the authors consider



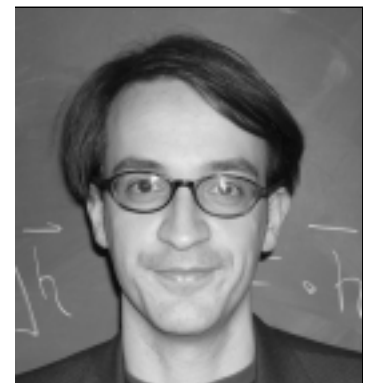
Spatially discretized solutions to PDEs (such as are common in numerical analysis) possess a braid-theoretic duality which mirrors Alexander duality in homology.



Lifting a collection of solutions to a scalar partial differential equation from their graphs to 3-d yields a topological braid.

nonlinear partial differential equations which are of "parabolic" type. Such equations model processes as diverse as the diffusion of heat or the propagation of a rumor. In settings where the equations are truly nonlinear, very complex dynamics can ensue, frustrating the analysis.

Ghrist and Vandervorst use an oblique approach. They first translate the dynamical problems to a problem involving "braids"—the topological objects one normally associates with long hair. Topologists have long known that braids form an algebraic structure—a group—and that the algebra interacts with the topological pleating of braids in a deep manner. By leveraging these structures, the authors can squeeze deeper algebraic information out of the differential equations, previous treatments of which amount to counting integers as opposed to counting braid types. This additional algebraic structure dovetails with a very powerful Morse theory to establish an algebraic and topological "hierarchy" of braids which arise in parabolic differential equations. In the end, a sophisticated yet computable "Homotopy Braid Index" encodes this rich structure in a manner useful in applications for detecting when certain solutions exist and with what frequency.

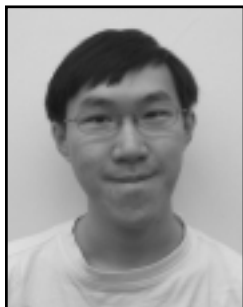


Robert Ghrist

Achievements

Each spring, the department presents awards for outstanding achievement to graduate and undergraduate students. This year's award ceremony was held April 25, 2006, in Altgeld Hall.

Graduate Student Awards



O-Yeat Chan

Recipient of **Bateman Prize in Number Theory** which is awarded annually to a graduate student in number theory for outstanding research in number theory. The Prize is named after Emeritus Professor Paul Bateman, who served the Department of Mathematics as Head in 1965-1980. This year's winner, O-Yeat Chan, is completing his doctorate in May 2006 with a thesis under the direction of Professor Bruce Berndt. As an undergraduate, Chan majored in both mathematics and physics at the University of British Columbia. He entered the University of Illinois graduate program at the age of 18. He has published three papers and has two further papers accepted for publication.



Timothy Kilbourn

Awarded the **Bateman Fellowship in Number Theory** for 2006–2007. Kilbourn is in his fourth year of graduate study and is working with Scott Ahlgren. Timothy has written three papers on topics related to the arithmetic properties of the Fourier coefficients of various types of modular forms. He is an active member of the number theory group at UIUC, and has given a number of conference and seminar talks on his work. Kilbourn is the fifth recipient of this award which is given to a graduate student actively working on his/her thesis. The Bateman Fellowship is named for Emeritus Professor Paul Bateman, who joined the UIUC Department of Mathematics in 1950. Bateman served as department head from 1965-1980.



Nadya Markin and Lucas Sabalka

Received the **Irving Reiner Memorial Award** which is awarded to one or more graduate students in recognition of outstanding scholastic achievement in the field of algebra. Markin is completing her Ph.D. with advisers Nigel Boston (Univ. of Wisconsin at Madison) and UIUC Professor Stephen Ullom. Her work is in algebraic number theory, in particular the Inverse Galois Problem. After generalizing a result of Geyer and Jarden on realization of p -groups (submitted for publication and presented at Madison), she has continued working on realizing Galois groups with minimal ramification. Her results will be presented by Nigel Boston at the April AMS meeting in Durham, New Hampshire. Markin's undergraduate degree is in computer science from UIUC. Her interest in number theory was sparked by a number theory course that she took as an exchange student in Vienna.



Lucas Sabalka came to UIUC as a Ph.D. student in mathematics in Fall 2002. Throughout his studies he has been supported by an NSF graduate fellowship and by a VIGRE fellowship. Lucas works in Geometric Group Theory, with a specific emphasis on graph braid groups and configuration spaces of finite graphs. His advisor is Ilya Kapovich. Lucas will be graduating in Spring 2006. In Fall 2006 he begins a 3-year postdoc as an Arthur J. Krener Assistant Professor of Mathematics at the University of California at Davis.



Brahana TA Instructional Award

D. Jason Gibson and **Bart Snapp** have been awarded the Brahana TA Instructional Award. Jason Gibson is completing a Ph.D. under the direction of Professor A.J. Hildebrand. His research falls at the interface of combinatorics and number theory. His thesis has the distinction of breaking a thirty-year old record on a classical problem of Paul Erdős on so-called covering congruences. He is expected to earn his Ph.D. by the end of this academic year and has accepted a tenure-track position at Eastern Kentucky University beginning in Fall 2006.

Bart Snapp is a fifth year graduate student studying commutative algebra under the supervision of Professor Sankar Dutta. Throughout his career, Bart has tried to be diverse in his teaching styles. To this end, he has taught discussion, large lecture, and *Mathematica*-based courses at UIUC. He did his undergraduate work at the Ohio State University. There, he taught calculus to high school students via the internet. Recently, he has been working hard to help solidify the curriculum of Math 119, Ideas in Geometry, here at UIUC.



The Brahana TA Instructional Award was established in 2005 with funding from the H. Roy Brahana Fund. It is presented to graduate teaching assistants for exemplary teaching. A committee of faculty, graduate and undergraduate students determines the winners. Awards are based on classroom observation, comments from students, and a written report by the nominees describing their teaching goals.



Department TA Instructional Award

Malgorzata Konwerska has been awarded the **Department TA Instructional Award**. Malgorzata is in her fifth year at UIUC. She is currently working on a problem in Noncommutative Probability, involving both Operator Algebras and Probability Theory. Her thesis adviser is Professor Marius Junge.

The TA Instructional Award was established in 1979. It is presented to graduate teaching assistants for exemplary teaching. Awards are based on classroom observation, comments from students, and a written report by the nominees describing their teaching goals.

Sander Parawira winner of 2006 UIUC Undergraduate Math Contest

This year's UIUC Undergraduate Math Contest took place April 8, 2006. The winner was **Sander Parawira**, a Freshman in Electrical Engineering and Computer Science, with 50 out of a possible 60 points. Sander is a newcomer to the UIUC contest scene, but he has considerable experience in problem solving as a successful participant at International Mathematical Olympiads. **David Grayson**, a Sophomore in Engineering and Physics and co-winner of last year's contest, and **Ian Shipman**, a Senior in Mathematics, tied for second place, with 48 points each. Rounding out the prize winners was **Mu Sun**, a Senior in Computer Science, who took fourth place with 40 points.

For more information, including contest problems and solutions, and a listing of winners of past UIUC Undergraduate Math Contests, visit the U of I Math Contests webpage, <http://www.math.uiuc.edu/contests.html>.

Achievements

Undergraduate Student Award Recipients



Simina Maria Boca

Received the **H. Roy Brahana Prize in Mathematics** which is awarded to a graduating senior in any discipline with a distinguished undergraduate career in mathematics. Maria is graduating with highest distinction in math having received an A+ in a majority of

her courses. She has finished the grad prep option while completing the honors sequence and a couple of graduate math courses. Last summer she was a Research Aide at Argonne National Laboratory and she is doing her honors thesis in Bioinformatics. She won the Elizabeth R. Bennett Scholarship and was a participant on the Putnam team last year.



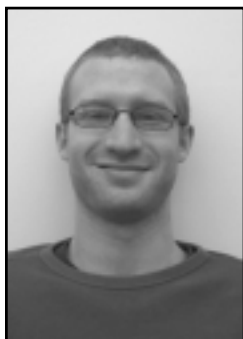
Andrew Webster

Received the **Major Award in Mathematics**. He has received an A (or A+) in every math course he took at UIUC while earning a Math degree (graduate prep option) along with his Engineering degree in Materials Science. He has been a participant in our honors sequence and had an individual REU with John D'Angelo in Summer 2004.



Brian F. McKenna

Received the **Major Award in Mathematics and Computer Science**. Brian is a Junior who has received between an A- and an A+ in all of his classes. He is a James Scholar in the College of Liberal Arts and Sciences, and is pursuing a minor in Business. During his summer Brian works as a counselor for children.



Ian C. Shipman

Recipient of the **Greenwood and Trjitzinsky Prize in Undergraduate Mathematics** which recognizes the best paper in mathematics written by an undergraduate. His research paper, "The distinguishing number of the iterated line graph," grew out of an independent study that Ian did with Professor

Stephen Hartke last spring when he was taking Math 412 Graph Theory. He also did an REU last summer. He has received an A+ in most of his math courses including two graduate courses last fall and he won the Elizabeth R. Bennett Scholarship last year.



Noel Ramsey DeJarnette

Received the **Major Award in Teaching of Mathematics**. Noel has received an A (or A+) in every math course he has taken so far. Besides being a James Scholar, Noel is also the current president of Pi Mu Epsilon and the department's Undergraduate representative on the Undergraduate Affairs Committee. He

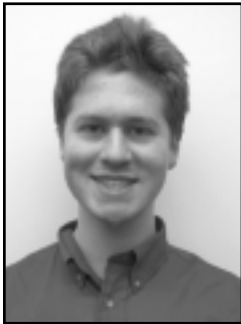


Todd Michael Nagy

Received the **Major Award in Actuarial Science**. In addition to graduating with distinction, Todd also passed three national exams. He has worked as an intern at the State Farm Research Center in the University of Illinois Research Park since it opened a little over a year ago, working on

Generalized Linear Models in insurance ratemaking. He has also given presentations to State Farm corporate executives.

has been working with Randy McCarthy this year to create opportunities for Math students to work in the local schools which has resulted in his founding the new math club UIMathCo (University of Illinois Math Community Outreach).



David Grayson and Jack Scheff Received the **Elizabeth R. Bennett Scholarship in Mathematics** which is awarded to one or two juniors or sophomores in mathematics based upon a student's GPA and strength of courses.

David Grayson is a physics major who has also nearly completed a Math major and the honors sequence earning an A+ in essentially every course. His instructors write that he is "inquisitive, curious, and completely unafraid to ask questions" and "the most impressive undergraduate I have encountered at UIUC."

Jack Scheff was selected as a National Semifinalist in the Physics Olympiad while in high school and was among the finalists for the Math Olympiad team. He is a participant in our honors sequence and currently has a 4.00 GPA in his math courses including several A+'s. His instructors write that "Scheff has the ability to get a Ph.D. in mathematics, and at an excellent university."



Morgan S. Polikoff

Received the **Emily Mann Peck Scholarship in Mathematics** which is awarded to outstanding undergraduate students majoring in mathematics based not only on high academic achievement but also for demonstrating characteristics that exemplified Dr. Peck's life and career: high

personal standards of ethics and scholarship, passion for teaching, well-rounded eclectic interest in life and a passion for the arts. Morgan is graduating with a Minor in Teaching Secondary Mathematics and an overall GPA of 3.98. He is a Chancellor's Scholar in the Campus Honors Program and has taken an impressive scope of courses both in the sciences and humanities while earning his degree.



Ahlgren receives LAS Teaching Award

Scott Ahlgren has been awarded the **LAS Dean's Award for Excellence in Undergraduate Teaching**. Ahlgren's educational activities span the range of instructional levels, from high school outreach programs through introductory undergraduate courses to advanced undergraduate and graduate courses in his research specialty. He has begun training and mentoring both graduate students and postdoctoral fellows. Finally, he has devoted considerable time and energy toward the goal of bringing mathematics "to the masses" through public lectures.



Ahlgren has appeared on the Incomplete List of Teachers Ranked as Excellent by their Students four times for both graduate and undergraduate courses. Comments from current and former students emphasize Ahlgren's effectiveness in the classroom. Most frequently, students recall his excitement and enthusiasm, his patience and understanding, and his exceptionally clear and concise explanations.

During the past four years Ahlgren has taught four-day short courses in number theory at the University High School in connection with their "Agora Days" program. During the summers of 2003 and 2005 he directed (together with Craig Russell of University High) the "High School Math Days" program. Ahlgren mentions that one of his proudest moments came when a student in this program, who had previously professed a disinterest in mathematics, declared at its conclusion that he now wanted to become a mathematician.

Ahlgren, an Associate Professor, received his Ph.D. from the University of Colorado at Boulder in 1996. He joined the faculty at Illinois in 2001. His research specialty is number theory. He is an expert in the use and application of modular functions, and his research related to this topic has appeared in the top journals in the field.

MATRIX math club activities

MATRIX (Mathematical Advancement Through Research and Idea eXchange), the Undergraduate Math Club, has been busy this year! During the fall semester, the club hosted several speakers. Professor Bruce Carpenter talked about the “Prodigal Sons in a Family of Curves” and the students enjoyed his demonstration using *Mathematica*. In November, Professor Bruce Reznick gave an intellectual discussion entitled “What does ‘less than’ mean?” Also in November, MATRIX helped the department host an evening with Barry Greenstein, a UIUC alumnus, mathematician, author, and world-renowned poker player.

At a special MATRIX meeting, UIUC alum Peggy Ruff discussed her career path from a Secondary Education Math major to VP of Logistics for a multinational company. For the first MATRIX movie night, members stepped off campus to see the movie “Proof.” To wrap up fall semester, MATRIX and the Department of Mathematics sponsored a talk by number theorist Carl Pomerance, vice-president of the Mathematical Association of America (MAA). Professor Pomerance gave a talk entitled “Primal Screens” that highlighted recent progress and some of the many problems about prime numbers that are still unsolved.

The spring semester kick-off activity was a tour of the bells in Altgeld Hall where the students got a chance to show off their musical abilities. In late February, members joined for a second movie night to enjoy one of Professor George Francis’s movies, “Inside-Out,” from his extensive math-related movie collection.

The second annual UIUC Pi Day 2006 Celebration was a huge success this year! Students participated in Pie-Walks throughout the afternoon—receiving slices of pies donated by Bakers Square. Students also had the opportunity to guess the number of mini-pencils in a jar. The correct number of pencils was 388. Two MATRIX members had



Pie eating contest on Pi Day.

the closest guess of 378 pencils. For a \$50 cash prize, participants were given the opportunity to write as many digits of pi as possible from memory. With an impressive 864 digits, undergraduate physics major Hayley Suits blew away the competition.

Professor Karen Mortensen and Instructor Kathleen Smith kindly took the time to bake pies for the Faculty Bake-Off competition. Karen’s Apple-Cranberry pie won over Kathleen’s Rhubarb by 1 vote! Starting at 3:14 p.m., mathematics’ Professor Randy McCarthy challenged chemistry’s Professor Paul Kelter to a pie race in which they were asked to dig for a dime hidden in a pie and then walk with this mutilated pie balanced on their heads. Though they won’t mention who “won,” MATRIX thanks both for being such good sports and providing great entertainment for those in attendance! In a competition between clubs, MATRIX members challenged members from SEM (Society for Experimental Mechanics) to a pie eating contest. Although MATRIX’s Jeffrey Rade was the first to completely finish his pie, SEM’s team won the overall contest.

To close the month of March, MATRIX and Pi Mu Epsilon jointly hosted Eric Weisstein, creator of the MathWorld.com math encyclopedia. Dr. Weisstein talked about his website, MathWorld.com, and also gave a sneak peek at a few not-yet-released features of *Mathematica*.

In April, Professor Bruce Carpenter gave a lecture and on April 21st, MATRIX hosted nearly 200 of the high school students arriving early for the ICTM Math Contest Finals. Members planned a dinner, math-related team games and meet-and-greets with undergraduates at Allen Hall, as well as open-gym activities at CRCE.

MATRIX plans an end-of-year picnic at Illini Grove to thank all those who have helped make this past year a success. For further information on MATRIX, please visit www.uiuc.edu/ro/matrix.



Students tour Chimes Tower in Altgeld Hall.

Local chapter of Pi Mu Epsilon restarts after 17 years

This semester marked the beginning of Illinois's Alpha chapter of Pi Mu Epsilon after a seventeen year hiatus. National past President Robert Smith from Miami University spoke and outlined the rich tradition of the Alpha chapter. Over twenty new members were inducted to continue that tradition, and meetings have begun to set the focus for this new group on campus. A second induction ceremony was held April 10 for those unable to attend the earlier ceremony.

Pi Mu Epsilon offers a great opportunity to be recognized for continued excellence and achievement in mathematics through promoting scholarly activity. With that in mind, one of our goals is to end the state of Illinois's publication drought in the Pi Mu Epsilon Journal. Through Pi Mu Epsilon, we hope to raise the profile of mathematics and the University of Illinois by linking excellent students and rewarding outstanding achievement. See their website for more information at www.math.uiuc.edu/PME or contact PME President Noel DeJarnette at ndejarne@uiuc.edu or Alison Champion in the UIUC Undergraduate Office at abc@math.uiuc.edu.



New student organization: Illinois Mathematics Community Outreach

Last semester an intrepid group of students began a program dubbed the Mathematics Traveling Road Show. Their goal was to bring interesting activities to middle and high school students in order to raise the profile of mathematics and the University of Illinois while also providing useful professional experience for the volunteers. Last semester they taught lessons to a seventh grade class at Edison Middle School, and with the help of toothpicks and gumdrops, they explored platonic solids and relationships such as similarity and scaling factors. Despite the humble beginnings, last semester was considered a success and they have been asked back to Edison as well as being invited to St. Joseph-Ogden Middle School.

Out of this endeavor has sprung the student organization "University of Illinois Mathematics Community Outreach" (UIMathCo). This organization will incorporate the Mathematics Traveling Road Show and new activities as well as other programs like meeting with high school math clubs to talk about the transition to university level mathematics. We believe that these types of opportunities will not only give back to the community, but will also provide excellent opportunities for volunteering and professional development. Our goal is the continued growth of student involvement—not every member must present activities in the classroom. We are always looking for new ways to get University of Illinois students linked with local schools. The more members we have the more new ideas and ways to get involved. For more information about UIMathCo, contact Noel DeJarnette at ndejarne@uiuc.edu.

Help needed for update of alumni database

The Graduate Office database of alumni has close to 1100 entries and goes back to our first Ph.D. graduate in 1903. Our goal is to make this valuable resource as comprehensive and up-to-date as possible. Now you can help! A website has been set up with a convenient form for entering data. We invite all alumni to help us update our records by visiting the site at http://www.math.uiuc.edu/GraduateProgram/alumni_database.html.

We welcome all comments or suggestions for improvements. These, as well as any questions you may have, can be sent to aluminfo@math.uiuc.edu.

Conferences

Geometric Group Theory on the Gulf Coast Conference (G³)

March 16-19, 2006, University of South Alabama, Mobile, AL, <http://www.math.uiuc.edu/~mineyev/ggg/>

Organizers: Stephen Brick (Univ. of South Alabama), Craig Jensen (Univ. of New Orleans), Igor Mineyev (Univ. of Illinois)

The G³ Conference resembles geometric group theory itself—it lets algebra, geometry, topology and analysis interact. We invite experts in these fields, and the educational talks at the beginning of the conference are designed with students and recent Ph.D.'s in mind. They are very much encouraged to attend.

LOGIC AND MATHEMATICS 2006

June 9-11, 2006, University of Illinois at Urbana-Champaign, <http://www.math.uiuc.edu/Bulletin/lm2006.html>

Organizers: C. Ward Henson (Univ. of Illinois) and Slawomir Solecki (Univ. of Illinois)

The focus of the meeting will be on descriptive set theory and its connections (with algebra, topology, measure theory, topological dynamics, combinatorics, etc). In part, the meeting is organized to honor Alexander S. Kechris of CalTech on the occasion of his 60th birthday. Financial support for this meeting is provided by a grant from the U.S. National Science Foundation.

13th SIAM Conference on Discrete Mathematics

June 25-28, 2006, University of Victoria, Victoria, British Columbia, Canada, <http://www.siam.org/meetings/dm06/>

Organizers: Douglas B. West (Univ. of Illinois), Chair; Andreas Brandstädt (Universität Rostock), Jennifer T. Chayes (Microsoft Research), Fan Chung Graham (UCSD), Martin Grötschel (ZIB), H. A. Kierstead (Arizona State Univ.), Bojan Mohar (Simon Fraser University), Michael Molloy (University of Toronto), C. A. Rodger (Auburn Univ.), Frank Sottile (Texas A&M Univ.), Madhu Sudan (MIT), László Székely (Univ. of South Carolina)

The purpose of this conference is to highlight the major theoretical advances in the field, the development of new tools for discrete mathematics, and the most significant of the new applications of discrete mathematics to problems arising in industry and business. The conference also seeks to bring together participants from the many different environments where discrete mathematics is developed and applied.

Geometric Analysis and Applications

July 12-15, 2006, University of Illinois at Urbana-Champaign, <http://www.math.uiuc.edu/~tyson/UIUC06.html>

Organizers: Luca Capogna (Univ. of Arkansas), Scott Pauls (Dartmouth College), Jeremy Tyson (Univ. of Illinois)

The focus of the conference will be on recent developments in the study of geometry and analysis in metric measure spaces with an emphasis on sub-Riemannian geometric analysis, including applications to problems in robotics, control theory, the geometry of the visual cortex, and digital image reconstruction.

Complexity of mappings in CR geometry

September 11-15, 2006, American Institute of Mathematics, Palo Alto, California

<http://www.aimath.org/ARCC/workshops/complexitycrmap.html>

Organizers: Peter Ebenfelt (Univ. of California at San Diego) and John P. D'Angelo (Univ. of Illinois)

This workshop, sponsored by AIM and the NSF, will study mappings in CR geometry. Participants will focus on a quite specific part of this general subject, namely the relationship between the complexity of a CR mapping and the complexity of the CR structures on the domain and target manifolds. The workshop has three principal goals. The first goal is to determine the fundamental notions of CR complexity and to prove sharp results about these notions. The second goal is to organize CR complexity theory into a broad framework that will be useful in CR geometry and also apply to other parts of mathematics. The third goal is to bring active senior researchers and young mathematicians together to work in a focused manner that will forge interactions and guide future research.

Model Theory of Metric Structures

September 18-22, 2006, American Institute of Mathematics, Palo Alto, California

<http://www.aimath.org/ARCC/workshops/continuouslogic.html>

Organizers: C. Ward Henson (Univ. of Illinois) and Itay Ben-Yaacov (Univ. of Wisconsin)

This workshop, sponsored by AIM and the NSF, will focus on the use of model theoretic ideas in analysis and metric geometry, bringing together model theorists and specialists from a few key application areas for a period of intense discussions. A diverse combination of backgrounds will allow the participants to explore from new angles certain examples, applications, and theoretical problems that define the frontier of research on the model theory of metric structures. A major goal of this workshop is to overcome communication barriers between model theorists and analysts. We will use continuous logic as a common ground for collaboration. This recently developed logic combines familiar semantic constructs from analysis with the syntactic framework of first order logic.

Faculty News

■ **Douglas B. West** has been appointed as a 2006-2007 Associate in the Center for Advanced Study to carry out studies on research and scholarship in combinatorial mathematics.

■ **Julian Palmore** participated in a March meeting at Wilton Park, U.K. on international collaboration on planning for pandemics. Principal concern for the conference is the evolution of bird flu to human to human transmission. His paper on "A clear and present danger to international security: highly pathogenic avian influenza" has been accepted and will appear in the June edition of *Defense & Security Analysis*. He has been invited to deliver a paper at an international conference in Beijing in June where he will speak on the topic of avian influenza (bird flu). His research during the summer will focus on the mathematics of epidemiology of emerging infectious diseases.

In September 2006, ACDIS and the MacArthur Foundation will host an international scientific meeting at Cold Spring Harbor Laboratory's Banbury Center on "Emerging infectious diseases." Of principal concern is avian influenza, which by that time, will have been found throughout the European Union, Africa and potentially North America. Palmore is principal investigator for UIUC's MacArthur Foundation grant.

■ **Debra Woods and Jerry Uhl** gave the opening address at the Seminar on Symbolic Computation in Education from April 12-14, 2006 in Beijing, China. One objective of this seminar was to bring together foreign experts and Chinese researchers and educators actively involved in developing, using, and practicing methods and software tools of symbolic computation for education to exchange ideas, views, and pedagogical techniques and to build up contacts for future cooperation. One of the other talks at the seminar referenced the work of Bruce Reznick.

■ **Derek Robinson** attended an international conference "Ischia Group Theory 2006" held in honor of Akbar Rhemtulla in Ischia (Naples, Italy) where he gave a talk entitled "Inert subgroups and inertial groups." He is serving as a member of the external committee to evaluate the Mathematics Department at SUNY in Binghamton.

In memoriam

Isidora Albrecht

Isidora Albrecht of Urbana passed away February 26, 2006. She was a retired biologist who had worked in laboratories in Bucharest, Yale University, and the University of Illinois. Mrs. Albrecht was married to Felix Albrecht in 1947 in Romania. They came to the United States in 1964. In 1968, Felix was appointed Professor of Mathematics at the University of Illinois in Urbana-Champaign, where he became an Emeritus Professor in 1992. He died in Urbana in December, 1998.

Nina Rubel

Nina Rubel passed away December 15, 2005 at home in Champaign. Apprenticed as a journalist at the age of 15 in Denmark, she has written for Danish publications, the *Town Topic* in Princeton, NJ, the *Williston Herald* in North Dakota, *The Courier* in Urbana, IL, and *The News-Gazette* in Champaign, IL. She is the author of the 1981 book *Heartland Beat*. Mrs. Rubel was married to Lee A. Rubel in 1954 in Denmark. Lee Rubel was a Professor in the UIUC Department of Mathematics from 1958 to 1993 when he retired to devote his time to research. He died in 1995.

Eutrice Ting

Eutrice Liu Ting passed away February 28, 2006 in Ann Arbor, Michigan. She is survived by her two children and five grandchildren. She was married to Tsuan Wu Ting, a Professor in the UIUC Department of Mathematics from 1966 until his retirement in 1992. He died in 1997.

Calcul*rt, a celebration of art and mathematics

The “21st Century Gallery” on the lower level of the Krannert Art Museum presents Calcul*rt, a celebration of art and mathematics, which opened on Thursday, March 9, 2006. The opening took place on the CANVAS and in the newly-formed electronic gallery of the museum. George Francis conducted a walk about the real-time interactive computer animations created by his colleagues and students at the UIUC and UIC Mathematics Departments and the NCSA, EVL and ISL: Donna Cox, Dan Sandin, Lou Kauffman, John Sullivan, Stuart Levy, Camille Goudeseune, Ben Schaeffer, Stan Blank, Ray Idaszak, Glenn Chappell, Chris Hartman, Alexei Bourd, Matt Woodruff.

Thursday, May 4, 2006 will be an “Evening of Mathematical Art” at the Krannert Art Museum. Beginning at 7 p.m., the curators and contributors of Calcul*rt will guide, explain and demonstrate items in the show. At 8 p.m. the audience is invited to join show contributors Donna Cox, George Francis, Hank Kaczamarski, Rose Marshack and Rick Powers in a free flowing discussion on the subject: “How can you tell that it’s mathematical art?”

The CANVAS, a joint effort between the Integrated Systems Laboratory of the Beckman Institute at the University of Illinois and the Krannert Art Museum, is a large virtual reality research and exhibition laboratory. Visitors don polarizing stereo glasses and enjoy 3D immersive applications that explore the boundaries between Mathematics, Art, Narrative and Sound.

The exhibit, which will close in June 2006, features many different media exploring the boundaries between mathematics and art. Included are a new electronic net-driven art piece inspired by Richard Powers (Prof., English) and developed by Rose Marshack (Art & Design), Nicholas Duchowski (Mathematics), Abby Watt (Art), Erin Miller (Art & Design) and a new electronic installation by Jonas Downey (MFA, Narrative Media). Mathematically-defined sculptures include wood carvings by Brent Collins, holographic images by Donna Cox and Ellen Sandor, wooden sculptures by Richard Valentin (Argonne), 3D sculptures by Stuart Dickson, silicon bronze sculpture by Helaman Ferguson, and computer-generated 3D sculpture by John Sullivan and Ben Grosser.

Some mathematical humor...

by Bruce Reznick



On Feb. 25, George and Bettina Francis held their annual Mummerei party in advance of Mardi Gras, and I decided to come as Moses. I wore a belt-less bathrobe, sandals and walking stick, and carried a tablet containing the following (top) Ten Commandments, which I transmit unto you.

10. Thou shalt not covet thy colleague's office, nor his salary, nor his grants, nor his teaching load.
9. Thou shalt not bear false letters of recommendation nor referee's reports.
8. Thou shalt not plagiarize.
7. Thou shalt not submit the same paper to two journals.
6. Thou shalt not kill a career.
5. Honor thy teachers and thy students.
4. Thou shalt remember the sabbatical and keep it holy.
3. Thou shalt not take the word “proof” in vain.
2. Thou shalt create no unnecessary committees.
1. Thou shalt know the truth and the truth shall maketh thee free. (The truth shall followeth from three lemmas, a routine Mathematica computation left as an exercise for the reader, and a remark of David Hilbert.)

Bruce Reznick is a professor in the UIUC Department of Mathematics. Bruce Reznick's degrees are from Caltech (B.S., 1973) and Stanford (Ph.D., 1976). He has been on the faculty of the University of Illinois since 1979. He was a Sloan Foundation fellow from 1983–1986, and received the Prokasy Award for Excellence in Undergraduate Teaching from his College in 1997. His research interests are in number theory, real algebraic geometry, and combinatorics. He's not sure what he wanteth to do when he grows up.