Math Times

Department of Mathematics, Spring/Summer 2013

Mathematics investiture honors Professors Philippe Di Francesco and Rui Loja Fernandes

by Matthew Ando

The excellence of a math department proceeds from the quality of its faculty, students, and staff. On February 28, 2013, we celebrated the investiture of two new endowed professorships in the Department of Mathematics. These endowed positions enabled us to bring two remarkable mathematicians to Illinois.

Philippe Di Francesco is the new Morris and Gertrude Fine Distinguished Professor of Mathematics. Prof. Di Francesco is one of the world's leading scholars at the interface of mathematics and physics. Current areas of interest include enumerative and algebraic combinatorics and integrable models of statistical physics. His recent collaboration with Prof. Rinat Kedem is transforming the theory of cluster algebras. He comes to Illinois from the Institut de Physique Théorique du Commissariat à l'Energie Atomique in Saclay, France.

The Fine Professorship was made possible by the generosity of Ken and Rebecca Fine, who established the professorship in memory of Ken's parents, Morris and Gertrude Fine. Dr. Fine received his BS, MS, and PhD degrees in mathematics from Illinois. His career included 30 years of executive, management and engineering experience in the semiconductor and computer industries. From 2010–2012 he served on the UI Mathematics Development Advisory Board.

Rui Loja Fernandes is the new Lois M. Lackner Professor in Mathematics. He is a world leader in the study of Poisson geometry, a vast generalization of symplectic geometry with the potential to bring together a number of disparate areas of mathematics. He has repeatedly obtained fundamental results which, taken together, show that Poisson geometry can indeed realize this potential. He comes to Illinois from the Instituto Superior Técnico in Lisbon, Portugal, where he was Professor and Head of the Department of Mathematics.

Photo by Thompson-McClellan.

At the investiture ceremony, pictured from left: Matthew Ando, Chair, Department of Mathematics; Dr. Ken Fine; Professor Philippe Di Francesco; Ruth Watkins, Dean of the College of LAS; Professor Rui Loja Fernandes; Professor Sheldon Katz; and Barbara Wilson, Vice Provost for Faculty and Academic Affairs.

The Lackner Professorship was made possible by the generosity of Lois M. Lackner. Dr. Lackner earned BS and MS degrees in the teaching of mathematics, and a PhD in education, all at Illinois. She is associate professor emerita at Loyola University of Chicago. She authored articles on mathematics teaching and wrote 4th and 5th grade teachers' editions for a Harper and Rowe mathematics series.

It is wonderful to bring scholars like Prof. Di Francesco and Prof. Fernandes to Illinois, and we are grateful to Dr. Lackner and to Dr. and Mrs. Fine for enabling us to do so.

In this issue:

Alumna profile 3
Awards 4
PhD alumni news 7
Math contests results 10
Research highlight 12
Department news 13
In memoriam 15
Giving form 19
Illinois Journal of Mathematics 20

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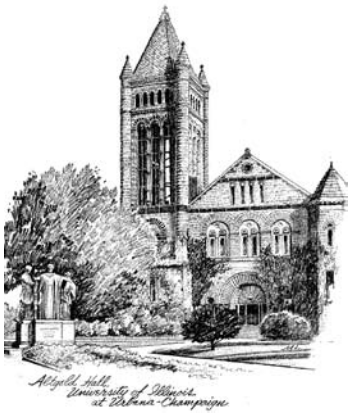


From the department chair

Dear Friends,

The National Research Council has just released a report on *The Mathematical Sciences in 2025*. It lays out an exciting vision for the mathematics enterprise at this moment in history. The report's main finding is this:

Mathematical sciences work is becoming an increasingly integral and essential component of a growing array of areas of investigation in biology, medicine, social sciences, business, advanced design, climate, finance, advanced materials, and many more… All of these activities are crucial to economic growth, national competitiveness, and national security… Education in the mathematical sciences should also reflect this new stature of the field.

The report concludes that, "The mathematical sciences have an exciting opportunity to solidify their role as a linchpin of twenty-first century research and technology while maintaining the strength of the core, which is a vital element of the mathematical sciences ecosystem and essential to its future."

As a large and excellent department at a great research university, we are in an extraordinary position to lead the way in realizing this vision. The range of topics in this spring's *Math Times* reflects many facets of this work.

To name just a few examples, remarkable scholars like our newly invested endowed professors Philippe Di Francesco and Rui Fernandes involve us in creating new mathematics both at the core and at the interface with other disciplines. You can read about Assistant Professor and Sloan Fellow Vera Hur's research on mathematics related to fluid dynamics and Assistant Professor Kay Kirkpatrick's NSF CAREER award to support her research on the statistical mechanics of superconductors.

We are committed to excellence and innovation in education. The rapid rise of online education invites us to demonstrate the power of a residential university. The success of undergraduate researchers at the Illinois Geometry Lab shows the value of putting faculty in contact with students when it can most make a difference. The alumna profile of Ceil Kuzma shows another UI math graduate involved in education, and reminds us that we reach out to the world through our alums.

It is an exciting challenge to build a department which embodies the aspirations of the *Mathematics 2025* report. Four goals are uppermost on my mind. The proposed renovation of Altgeld and Illini Halls will provide us with unparalleled space for collaborative research and education; we must continue to hire excellent faculty to chart new directions in research; we must constantly seek innovative ways to enhance undergraduate and graduate education; and we must continue to seek scholarships and fellowships to enable promising students to study with us. I am very grateful to our many supporters in this important work.

Matthew Ando
Chair, Department of Mathematics

Homecoming 2013

Mark your calendars for Homecoming 2013 to be held from 11:30 am-2:30 pm, Saturday, October 26, 2013, when the Illini match up against Michigan State. Our tent will be out in front of Altgeld Hall again this year.

More information is posted at www.math.illinois.edu/homecoming/ or visit us on Facebook. We invite all mathematics alumni to join us for a complimentary buffet lunch.

Alumna Profile: Ceil Kuzma

by Jim Dey

One of the constants of Cecilia "Ceil" Kuzma's life has been mathematics — first she studied it, then she used it in a 31-year career at Procter & Gamble and now, in a second career, she teaches it to high school students.

Ceil Kuzma

It's been a remarkable journey, one born of her father's desire for an education and his loyalty to the University of Illinois. "I am so lucky. Sometimes, I look back, pinch myself and say, 'Wow,'" said Kuzma.

She enrolled at the UI to study mathematics in 1967, graduating in three years to take a math-related research job with P&G in her hometown of Cincinnati.

"It was putting to work everything I had learned," said Kuzma. Her UI roots go much deeper, to the coal fields of West Virginia where her father grew up and was expected to follow his peers in their early teens deep into the coal mines. But he wanted a different life, choosing to remain in high school while working full-time in the mines. "He did that for four years," Kuzma said.

When her father, Ralph, was 21, just prior to the start of World War II, he enlisted in the U.S. Army and ultimately was assigned to the Chanute Air Force Base in Rantoul for training as a mechanic on B-17 bombers. Kuzma's dad met Joan (a teacher), made friends and identified the UI in nearby Urbana-Champaign as a place to return.

After the war, Kuzma's father enrolled at the UI on the GI Bill, married Joan, and studied accounting. After graduation in 1948, Kuzma's father got a job at General Electric and ultimately was transferred to Cincinnati, where he and his wife raised three children and instilled in them a deep loyalty to the UI, which they would regularly visit to attend football and basketball games and see friends.

"I could sing the (UI) fight song when I was five years old," Kuzma recalled. When she graduated from high school in Cincinnati with a deep interest in math and science, Kuzma said, the UI "was the only college I applied to attend."

The UI was a great choice for a number of reasons, one of which stemmed from her gender and her academic interests. Kuzma said that in high school she found that women were discouraged by social custom from studying math and science.

It was different at the UI, where she recalled that "nobody tried to tell me a girl shouldn't study math and science."

"For the first time in my life, who I wanted to be and what I wanted to do were right there for me," Kuzma said.

And that was, among other things, mathematics. "I just loved it. It was so elegant how it worked — the logic of the process, the pattern and the puzzle," she said.

Motivated more by academic interest than job prospects, Kuzma majored in mathematics and minored in chemistry, statistics and psychology. But she discovered after graduation that mathematics was a "very practical" major that helped her land a great job with a group of mathematicians and statisticians who worked with engineers and scientists in research and development.

She also said that her math education proved to be invaluable as her management responsibilities grew.

"When you learn to do theoretical mathematical investigations and proofs, you learn to consider the problem from all sides, evaluate possible approaches, plot a strategy and then do the work, revising as you proceed through the investigation," she said.

Kuzma worked her way up the corporate ladder during her long career at P&G, participating in development of major new consumer products. They include Head & Shoulders, a dandruff shampoo, Secret, a women's deodorant/anti-perspirant, and Pantene, which combined hair conditioner and shampoo.

P&G also sent Kuzma to graduate school to study statistics, where she met her husband, Ronald, a statistician now retired from Aventis Pharmaceuticals. She finished all the coursework and had written exams necessary for a doctorate at the University of Cincinnati, but decided not to write a dissertation because "I had this change in my life called a child," daughter Stephanie. Kuzma spent her final 10 years at P&G overseeing global research and development organizations located on four continents and new products and packaging for brands sold in over 120 countries.

Then a vice president of research and development, Kuzma's left P&G in April 2001 when she decided it was time for a new challenge. After considerable thought, she settled on a return to the classroom—this time as a teacher. It has proved to be another great move. Kuzma teaches honors level pre-calculus and calculus at 1,100 student Amelia High School in Batavia, Ohio, a school she describes as dominated by students from middle- and lower-middle class families.

"This is the hardest and most rewarding work I've ever done," she said. "I get to teach the highest level math classes in our district. I am teaching the best and the brightest students the district has to offer."

Kuzma said that her goal, in pursuing a second career, was to "do something that made a difference" and her work in the classroom has filled that need. So much so, Kuzma said that she can't imagine a second retirement.

"To me, this isn't work. This is life," she said. "This is a way of living that is different than work."

Still, old habits and interests from her P&G career remain. A trip to the store for her isn't like a trip for others.

"Nobody in my family will go to the store with me because I stand and stare at the shelves too long. I like to look at the shelves and see how the business is developing. It's part of the pattern and the puzzle," Kuzma said.

Jim Dey is a columnist and editorial writer for the Champaign–Urbana News-Gazette

AWARDS

Each spring, the Department of Mathematics presents awards for outstanding achievement to faculty, instructional and non-instructional staff, graduate students and undergraduate students. Funding for these awards comes from generous donations from alumni and friends of the department. For more information about these funds and how you can contribute, please visit www.math.illinois.edu/gifts/.

DEPARTMENT FACULTY AND STAFF AWARDS

N. Tenney Peck Teaching Award in Mathematics

Zoi Rapti

Zoi Rapti is the recipient of the 2013 N. Tenney Peck Teaching Award in Mathematics. Rapti received her PhD in 2004 from the University of Massachusetts and has been at Illinois since 2005, joining the department first as a J. L. Doob Research Assistant Professor, and then as an Assistant Professor in 2008. Rapti's research is at the interface of PDE, dynamical systems, and mathematical biology.

Rapti is a vibrant and clear instructor whose lectures have been praised by students at all levels. Outside of the classroom, she has been a founding member and the driving force behind the Illinois Biomathematics Program (www.math.illinois.edu/biomath/), an undergraduate research program where students work on year-long projects mentored by teams that include both mathematics and life sciences faculty. In addition to organizing the program, Rapti has also served as a faculty mentor for a long-running ecology project where the students work on equations in the laboratory and then spend summers in the field collecting the data to use in the models. The students she has mentored in this program have presented their work at several mathematics and ecology conferences.

The N. Tenney Peck Teaching Award in Mathematics is named for N. Tenney Peck, who joined the U of I Department of Mathematics in 1968 and remained on the faculty until his death in 1996. Peck, a pioneer in the field of functional analysis, specializing in non-locally convex spaces, was a dedicated teacher with an open door for students, and was active in curriculum development. The award is given to tenure-track faculty in the department for exemplary teaching.

Distinguished Teaching Award in Mathematics for Tenured Faculty

Tom Nevins

Professor Tom Nevins has been awarded the 2013 Distinguished Teaching Award in Mathematics for Tenured Faculty. Nevins received his PhD in 2000 from the University of Chicago. Before joining the faculty at Illinois in 2004, he held postdoctoral positions at the University of Michigan and MSRI. Nevins is an algebraic geometer who works at the interface of algebraic geometry, noncommutative algebra, integrable systems, and representation theory. One doctoral student has completed his degree under the co-supervision by Nevins, while two other PhD students are currently working on their dissertations with him.

Since arriving at Illinois, Nevins has taught five different graduate courses and six different undergraduate courses. Most recently, he has twice taught large lecture sections of Math 241 (third semester calculus) and has been active in redesigning the course. Nevins's research both shapes and is informed by his teaching of Math 241. For example, the theory of integrable particle systems, in which a significant part of his research lies, builds on the study of conservative vector fields in Math 241. Nurtured by many fruitful conversations with colleagues, Nevins also highlights the interplay of the theory of algebraic curves with vector calculus through the rational parameterization of the Folium of Descartes and the calculation of the area it encloses. The connection between teaching and research has extended to Nevins's development of a capstone honors course, Math 428, on algebraic curves. Beginning from a study of plane curves including both the lines, circles, parabolas, and hyperbolas familiar from high school mathematics and the Folium of Descartes, Nevins develops the classical geometry of curves from a modern perspective. Individual and group projects featuring, among other topics, algebraic curves in string theory, elliptic curve cryptography, and computational algebra highlights the relevance of the classical theory in the twenty-first century. Nevins has also organized graduate seminars and reading groups, and has twice chaired the Graduate Affairs Committee.

The Distinguished Teaching Award in Mathematics for Tenured Faculty, established by the department in 2007, is given to tenured faculty in the department exemplary teaching.

Distinguished Teaching Award in Mathematics for Non-Tenure-Track Faculty

Bob Murphy

The Distinguished Teaching Award in Mathematics for Non-Tenure-Track Faculty, established by the department in 2007, recognizes exemplary teaching by instructors, postdocs, and other non-tenure-track faculty in the department.

Bob Murphy is this year's recipient. Murphy is an alumnus of the University of Illinois in the Department of Mathematics, receiving his BS in 1989. He began his teaching career at the University of South Carolina in 1993. There he earned his MS degree in Mathematics, working with Illinois alumnus Michael Filaseta on the factorization of polynomials with small Euclidean norm.

Murphy served many roles at USC. He was an award-winning instructor, advisor to beginning math majors, director of the math tutoring center, department webmaster, and organizer of the statewide high school math contest.

He moved back to Illinois in 2009, and is currently the primary instructor for our large lecture Calculus I courses. Given how difficult it is for any large lecture instructor to receive recognition for his/her teaching successes, it is noteworthy that Murphy has appeared on the List of Teachers Ranked as Excellent by Their Students in 4 of the last 5 semesters (Calc I and Calc II included).

Exceptional Merit Award in Mathematics for Non-Instructional Staff

Tori Corkery

Established in 2010, the Exceptional Merit Award in Mathematics for Non-Instructional Staff is given to recognize a non-instructional staff member who exhibits excellence in his/her work.

Tori Corkery is this year's recipient. She joined the department in November 1998 and is currently the Program Administrative Assistant and Webmaster for the department. Corkery is exceptionally important to the department: she is responsible for the way we are seen by the outside world. She carries out a phenomenal number of tasks with skill and precision and with a consistently positive approach. Corkery is in charge of communications and media for the department. She maintains the department website, makes the department's beautiful posters and calendars, is the editor and publisher of *Math Times*, and she manages many of our departmental events. Her portfolio of responsibilities keeps growing; for example in recent years, her work on alumni relations and development has grown substantially. She carries out all of these jobs exceptionally effectively. The department benefits greatly from Corkery's many contributions, and she is a truly deserving winner of this award.

College of LAS Awards

LAS Award for Excellence in Undergraduate Teaching by Instructional Staff

Jennifer McNeilly

Jennifer McNeilly was awarded the 2013 LAS Award for Excellence in Undergraduate Teaching by Instructional Staff. McNeilly joined the department in 2001 and continues to play an important role in our pre-calculus program, designing and supervising our successful Math 115 course. The following year she was appointed Director of the Mathematics Merit Workshop Program. The Merit Program identifies entering freshmen from populations which have historically struggled in our calculus sequence, and offers these students the opportunity to take calculus with additional active learning "Merit Workshop" sessions, based on the research of Prof. Uri Treisman. These sessions are run by teaching assistants trained and supervised by McNeilly. The data show that Merit students continue at the university with at least a one letter-grade advantage over their peers who do not take part in the program.

In 2007 McNeilly, along with co-directors in Chemistry and Biology, was awarded an NSF grant for $2 million to expand the Merit program to cover pre-calculus and all three levels of the calculus sequence, and to establish an outreach training program. She now has 400 Merit students (originally 75), 18 graduate TA's (originally 3) and 19 workshop sessions (originally 3). In the outreach training program McNeilly and her Chemistry and Biology colleagues have conducted summer workshops for teachers from around the country conveying the Treisman Merit Workshop methods.

Finally, in 2012 the three Merit directors received over $500,000 from the NSF to establish a Merit Fellows Scholarship Program. The goal is to provide scholarships (approximately 20 a year) to students from the targeted populations to enhance retention of Merit students in the STEM disciplines. A colleague in the instructional staff summarized McNeilly's role as follows: "In thinking about the many great instructors I have known at the post-secondary level, I would say Jennifer fits perfectly into that group. She is a gem that the University is very lucky to have."

Nancy J. McCowen Distinguished Service Award

Lori Dick

Lori Dick is this year's recipient of the Nancy J. McCowen Distinguished Service Award from the College of Liberal Arts and Sciences. One award is made annually to honor a staff member for ongoing contributions which go above and beyond the expected level of service. Dick has worked for the Department of Mathematics since 1985. She has held many positions in the department including Typist, Secretary, Staff Secretary, Administrative Secretary, Administrative Aide, and Administrative Assistant. She has worked in the main office and the graduate office, and is currently the assistant to the associate chair. Dick's tireless and loyal service has been characterized by hard work, an ongoing commitment to improvement of departmental operations and to personal improvement, and a consistent willingness to go the extra mile for the faculty, the staff, and the generations of graduate students who have been fortunate enough to work with her.

AWARDS

Graduate Awards

Bateman Prize in Number Theory

The Bateman Prize in Number Theory is given annually to an outstanding graduate student working in number theory. The fund is generously funded by former Department Head Paul T. Bateman and his wife, Felice. Sadly, the Batemans both passed away just a few months ago (see obituaries on pages 16-17).

Joseph Vandehey is the 2013 recipient of the Bateman Prize for outstanding research in number theory. Joseph completed his undergraduate work at the University of Oregon. He is finishing his PhD this year under the joint supervision of Professors Florin Boca and Kevin Ford. He has produced original work on a broad spectrum of problems at the interface of number theory, ergodic theory and geometry. His specific achievements concern error bounds improvements in the classical van der Corput transform for exponential sums, the study of multiplicative functions with bounded partial sums, and statistical aspects of continued fractions. In a very recent paper, Joseph teamed with fellow graduate student Anton Lukyanenko to create a theory of higher dimensional continued fractions based on the geometry of the Heisenberg group. It is in many ways "cleaner" than prior theories of the sort and is potentially trailblazing.

Irving Reiner Memorial Award

Brian Ray is the 2013 recipient of the Irving Reiner Memorial Award. This award is named after Professor Irving Reiner (1924–1986), a long-time member of the University of Illinois Department of Mathematics and a leader in the field of integral representation theory. The award is given in recognition of outstanding scholastic achievement in the field of algebra.

Brian works in the area of geometric group theory and expects to graduate in Spring 2014. His thesis advisor is Professor Ilya Kapovich. Brian is a West Point graduate and an Iraq War veteran, and he started his PhD studies in mathematics after completing his military service. Brian's research project involves understanding length spectrum rigidity properties of group actions on trees arising in the study of the Coller-Vogtmann "Outer space." He is trying to understand when it is possible to reconstruct such an action from partial information given by "translation lengths" of some collection of elements of the group. In particular, he established a conjecture, posed by Carette, Francaviglia, Kapovich and Martino, that for every element of a finitely generated free group and for every automorphism of this free group, the orbit of this element under the cyclic group generated by the automorphism is always a non-spectrally rigid subset of the free group. Brian's proof of this result was recently published as an article "Non-rigidity of cyclic automorphic orbits in free groups" in the *International Journal of Algebra and Computation*. Brian's work utilizes an ingenious combination of modern algebraic, combinatorial and geometric methods. During the last year his algebraic insight and expertise led Brian to significant further progress on understanding relative versions of spectral rigidity for free groups.

Kuo-Tsai Chen Prize

Anton Lukyanenko has been awarded the 2013 Kuo-Tsai Chen Prize. The Chen Prize is named after Professor Kuo-Tsai Chen, a member of the Illinois faculty from 1967–1987 and an outstanding mathematician of international reputation for his contributions to the qualitative theory of ordinary differential equations and to algebraic topology. It is awarded in recognition of outstanding scholastic achievement by a graduate student whose research connects geometry and analysis or algebra and analysis.

Anton is working in complex hyperbolic and sub-Riemannian geometry under the direction of Professor Jeremy Tyson. Anton has truly excelled while here at Illinois. He has two published papers (in *Geom. Dedicata* and *Conf. Geom. Dynam.*), has one more paper submitted, and is finishing up two more. Among these papers he has seven coauthors, none on more than one paper, including coauthors at other U.S. and European institutions. His general research program centers on interactions between the geometry of complex hyperbolic space and analysis on the sub-Riemannian Heisenberg group. He has also worked on number theoretic applications of this interaction. He has given many talks on his research in both the U.S. and Europe. In addition to his superb research record, Anton has made many additional contributions to the department, including cofounding the Illinois Geometry Lab with Assistant Professor Jayadev Athreya, participating in the organization of GEAR activities with Professor Steven Bradlow, and co-organizing of a week-long retreat for U.S. graduate students in geometry to be held this summer.

Brahana TA Instructional Award

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. The 2013 recipients are Neha Gupta and Sarah Yeakel.

Neha Gupta is a third-year graduate student working under Professor Ilya Kapovich in geometric group theory. She has spent four-fifths of her life in New Delhi, India, where she also obtained her undergraduate degree. She then spent a year in Oxford, England getting her Masters degree. Here at the University of Illinois she has taught calculus at various levels and formats. She loves interacting with students from different backgrounds, and (mathematical) perspectives. She hopes to continue to teach, learn, and do mathematics until she is a hundred years old.

Sarah Yeakel is a third-year graduate student working with Randy McCarthy in homotopy theory. She studies the calculus of functors and attempts to convince her students that coffee mugs are the same as doughnuts while trying not to use the word functor in lieu of function in class. She spent her undergraduate years at Wayne State University in Detroit, where she began teaching and fell in love with Motown music.

Department TA Instructional Award

The Department TA Instructional Award was established by the department in 1979 and is awarded to graduate teaching assistants for exemplary teaching.

Joseph Vandehey is a fifth-year doctoral student in number theory, working under Professors Florin Boca and Kevin Ford. His research touches a number of topics in analytic, elementary, and ergodic number theory, although his favorite problems involve normal numbers. Joseph grew up in the suburbs of Portland, Oregon, and attended the University of Oregon for his Bachelor's degree. He has appeared three times on the List of Teachers Ranked as Excellent by their Students, and recently has worked as a mentor in the Illinois Geometry Lab, studying Apollonian circle packings and the mathematics of music. Joseph is graduating this year and will begin a postdoctoral position at the University of Georgia in the fall.

Katherine Alexander Anders is a fifth-year doctoral student working with Professor Bruce Reznick in combinatorial number theory. Her research project is on generalized binary representations, and a co-authored paper recently appeared in *Annals of Combinatorics*. She grew up in north Louisiana and received a B.S. in Mathematics from Baylor University in 2008. During her time at the University of Illinois, Katie has taught a variety of classes including traditional and active learning discussion sections, Merit recitations, and Calculus&*Mathematica* courses. She has appeared on the List of Teachers Ranked as Excellent by Their Students for every semester in which she taught. Katie plans to graduate in May of 2014 and pursue a career in academia.

Bateman Fellowship in Number Theory

The Bateman Fellowship in Number Theory is given annually to an outstanding graduate student working in number theory. The Bateman fellowship has also been generously funded by former Department Head Paul T. Bateman and his wife Felice.

Dan Schultz is the recipient of the Bateman Fellowship in Number Theory for the 2013-2014 academic year. Dan is currently a fourth year graduate student who did his undergraduate work at Michigan State University, where he majored in mathematics, but also took many courses in music, especially piano. His thesis advisor is Professor Bruce Berndt. Dan has published one paper, has had another paper accepted for publication, and has submitted a 75 page paper that has been with the referees for two years. The research for two further papers has been completed, with submissions soon forthcoming. Dan is an expert in *Mathematica* and programming, and he is also active in the Illinois Geometry Lab.

Dr. Lois M. Lackner Mathematics Fellowship

Ki Yeun Kim and Sarka Petrickova are the recipients of the Dr. Lois M. Lackner Mathematics Fellowship, established by the department through a generous gift by U of I mathematics alumna Dr. Lois Lackner.

Ki Yeun Kim is a third-year doctoral student working under the direction of Vadim Zharnitsky on Hamiltonian dynamical systems. Her research project is on modeling and analysis of a bouncing coin as a billiard system. This project originated from the applied dynamics and topology group REGS in 2012 organized by Professors Baryshnikov and Zharnitsky. Ki Yeun already has one joint paper that appeared in *Int. Math. Res. Notices* and one in preparation.

Ki Yeun grew up in Seoul, South Korea. She attended Carnegie Mellon University 2006–2010 supported by the presidential scholarship for science students from the Korea Science and Engineering Foundation. Ki Yeun received a BS in Mathematics in 2010 and the same year she became a graduate student here at Illinois. During her time at the UI, Ki Yeun has taught a variety of classes including traditional and Merit learning discussion sections and online NetMath courses. In the Spring 2013 semester she was a stand-alone instructor.

Sarka Petrickova is a second-year doctoral student in combinatorics and graph theory. She grew up in the Czech Republic, where she received a BS in applied mathematics in 2008 and an MS in mathematics in 2010, both from the University of West Bohemia. Sarka continued her studies there, starting her PhD program under Professor Tomáš Kaiser with a focus on graph coloring in 2010. She visited the University of Illinois for the REGS program in the summer of 2011, and started her PhD program at Illinois in January 2012. Sarka is planning to finish her comp exams soon, and already has submitted three papers. Her interests outside of mathematics include running, dancing and traveling.

PhD alumni news

Savage elected AMS Secretary

Carla Savage (PhD 1977) has been elected Secretary of the American Mathematical Society (AMS). Savage received her PhD under the direction of David Muller. She is currently a Professor in the Department of Computer Science at North Carolina State University with research interests in algorithms and theory of computation.

Yesilyurt receives Ames Award

Hamza Yesilyurt (PhD 2004) has received an Ames Award from the *Journal of Mathematical Analysis and Applications* for his 2012 paper, "Elementary proofs of some identities of Ramanujan for the Rogers-Ramanujan functions," where he significantly extended ideas of L.J. Rogers from about 100 years ago. Yesilyurt, who received his PhD under the direction of Professor Bruce Berndt, received the Bateman Prize in Number Theory from the Department of Mathematics at Illinois in 2004. After leaving Illinois, Yesilyurt was awarded the John Thompson Assistant Professorship at the University of Florida, a three-year postdoctoral position, before returning to his native Turkey where he is currently a professor at Bilkent University.

AWARDS

Undergraduate Awards

H. Roy Brahana Prize

Established in 1961, the Brahana Prize is the department's longest running and most prestigious undergraduate award. It is named after H. Roy Brahana, a distinguished member of the mathematics faculty at Illinois from 1920 to 1963. The prize recognizes the student with "the most exceptional undergraduate mathematics career." Many former Brahana Prize winners have moved on to illustrious careers, both within and outside of mathematics.

Brian Freidin is this year's recipient of the Brahana Prize. Brian is a senior in mathematics with a minor in computer science. He is taking the department's challenging grad prep concentration. So far he has completed all the requirements for the degree and is now taking some mathematics graduate courses, all with a near perfect GPA. In addition he has been involved in research through the Illinois Geometry Lab. Brian was a co-winner of the department's Fall 2012 Mock Putnam Exam, and he is a former winner of the Vincent O. Greene Scholarship and the Elizabeth R. Bennett Scholarship in Mathematics.

Most Outstanding Major Awards

Established in 1996, these departmental awards recognize outstanding undergraduate students in each of the four majors offered by the department. A student may be selected only once in his/her career for one of these awards.

Most Outstanding Major Award in Actuarial Science

The award for the Most Outstanding Major in Actuarial Science is given this year to Jenna Howell and Jessica Yeh.

Jenna Howell is an actuarial science major and a business minor with a 3.97 GPA, graduating from the University of Illinois in just three years. She has passed five professional actuarial exams, and completed internships at the State Farm Research and Development Center, and at Towers Watson consultants in Chicago. She is in her second semester as an instructor of Math 370, an actuarial exam preparation course. Jenna is currently the president of the Actuarial Science Club at the UI. After graduation, she will be working as a retirement consultant at Towers Watson in Chicago.

Jessica Yeh is an actuarial science major and an informatics minor with a 3.98 GPA. She has passed five professional actuarial exams, and completed two internships at Towers Watson consultants in Chicago. She has also been an instructor of Math 370, an actuarial exam preparation course. She has been the treasurer and vice president of the UI Actuarial Science Club, and has competed on the UI All-Girl Competitive Stunt and Tumble Club. Jessica won the 2013 Sam and Dubey Portnoy Memorial Scholarship, and the 2011 Elizabeth R. Bennett Scholarship in Mathematics. After graduation, she will be working at Towers Watson in the Property-Casualty Consulting Group, and the Risk, Consulting & Software area.

Most Outstanding Major Award in Mathematics

The award for the Most Outstanding Major in Mathematics is given this year to Matthew Novack and Kailin Yu.

Matthew Novack is a senior who is taking our challenging grad prep option and can boast of a near-perfect GPA. If this were not demanding enough, Matthew also has a passion for music. He has taken thirty music courses over the four years of his undergraduate career. Jazz, in particular, seems to be in his blood. Matthew is a former winner of the Emily Mann Peck Scholarship.

Kailin Yu is a senior in mathematics, who entered the University of Illinois in Spring 2011 as a transfer student. She is pursuing an operations research concentration in mathematics and is also majoring in statistics. Kailin is a former winner of the Dr. Lois M. Lackner Mathematics Scholarship.

Most Outstanding Major Award in Mathematics and Computer Science

Corey Fry is this year's recipient of the Most Outstanding Major Award in Math and CS. A fifth year senior, Corey is a double major in chemistry and in mathematics and computer science. He has been an outstanding student who has also been engaged in a number of ways outside of the classroom. As a part of the Luthey-Schulten research group, Corey has helped parallelize cell simulations so that they can run across multiple GPUs. He has served as a project leader for Engineering Open House, tutored general chemistry students, and served as a mentor and proctor for Science Olympiad. Corey has been a course assistant for Data Structures, Physical Chemistry I, and General Chemistry II. In 2010, he placed first at the University of Illinois in the Microsoft College Puzzle Challenge. He has won several awards and scholarships, including CS's Franz Hohn and J.P. Nash Scholarship (for students who have an interest in scientific computing), the Robert H. Doremus Scholarship (for outstanding performance in Chemistry), and the Walter G. May Award (for outstanding performance in Chemical Engineering).

Most Outstanding Major Award in the Teaching of Mathematics

The award for the Most Outstanding Major in the Teaching of Mathematics is given this year to Margaret Sharp. Margaret is a senior in mathematics with a minor in teacher education in Secondary School Teaching. This is a demanding program with the last semester dedicated to practical student teaching. Maggie, as she is known, has a near perfect GPA and is therefore an excellent choice for the Outstanding Major Award. She is also a Noyce Scholar. The prestigious Robert Noyce Scholarship encourages talented students in STEM disciplines—science, technology, engineering and math—to become K-12 science and math teachers.

Salma Wanna Memorial Award

The Salma Wanna Award honors the memory of Salma Wanna, who received her PhD from the University of Illinois in 1976. It was established by her family after her untimely death in 1980 and is given for "exceptional performance in mathematics to the most outstanding continuing student."

Shiladitya Bhattacharyya is this year's recipient of the Salma Wanna Award. Shil is a sophomore who has already declared grad prep as his concentration and is showing great promise in the courses in the math honors sequence. Indeed, they may not seem that much of a challenge because he is already taking two of our graduate courses. Shil is also one of the winners of a Spring 2013 Vincent O. Greene Scholarship in Mathematics.

Emily Mann Peck Scholarship

Established in 2002 in honor of Emily Mann Peck, a former mathematics faculty member and LAS Associate Dean, the Emily Mann Peck Scholarship recognizes a student in mathematics who, in addition to academic excellence, displays a well-rounded personality with eclectic interests and a passion for the arts.

Daniel Hirsbrunner is this year's recipient of the Emily Mann Peck Scholarship. Daniel is a sophomore with senior standing due to the fact that he earned 51 credit hours through proficiency scores in his first semester. Daniel is taking the program's grad prep concentration and can currently boast of a perfect GPA. At the close of the spring 2013 semester he has completed all the courses in the honors sequence, including Math 496 (Introduction to Research). Graduate courses are on the horizon. And his eclectic interest is …. Latin. Daniel is also one of the winners of a spring 2013 Vincent O. Greene Scholarship in Mathematics.

Vincent O. Greene Scholarship in Mathematics

The Vincent O. Greene Scholarship in Mathematics, established in 2012, is given to deserving undergraduate students based on academic merit with preference to candidates who plan to teach mathematics.

The Fall 2012 recipients of the Vincent O. Greene Scholarship are Peter Florido, Keren Garcia, Wenqi Su, Timothy Kang and Michael Palgen. All of these students are freshmen, though Peter and Keren have sophomore standing and Timothy has junior standing. All were selected because their high school applications to the university showed a strong interest in teaching as a potential career. Peter is clearly headed for the mathematics teaching concentration given his choice of classes. Timothy and Michael are both James Scholars headed for the actuarial science major. And Keren and Wenqi are currently sampling the possibilities in the mathematics major.

The Spring 2013 recipients of the Vincent O. Greene Scholarship are Shiladitya Bhattacharyya, Daniel Hirsbrunner, Nicole Pinakidis, Kelly Yedinak and Elizabeth Denz. Shiladitya and Daniel have been mentioned previously in connection with the Salma Wanna Award and the Emily Mann Peck Scholarship, respectively. Nicole, Kelly and Elizabeth are all students in the Secondary Education Teaching concentration, all are James Scholars and all have 3.9 GPAs. Nicole and Kelly are seniors while Elizabeth is a junior with senior standing.

Photo by Andrew Stengele.

Vincent O. Greene Scholarship in Mathematics recipients at the department awards ceremony on April 11, 2013. Front row (from left): Kelly Yedinak, Peter Florido, Nicole Pinakidis, Elizabeth Denz, Keren Garcia. Back row (from left): Michael Palgen, Wenqi Su, Timothy Kang, Shiladitya Bhattacharyya, Daniel Hirsbrunner.

AWARDS

Bradley M. and Karen A. Smith Scholarship

Given for the first time this year, this scholarship is awarded to an undergraduate student in the U of I Department of Mathematics who is studying actuarial science. Sarah Manuel is this year's recipient of the Smith Scholarship. Sarah is a third-year actuarial science major at the University of Illinois. She is also pursuing minors in business and in informatics, and is a James Scholar. Sarah has passed two professional actuarial exams, has been the lead project intern at the State Farm Research and Development Center, and is currently teaching an exam review course for actuarial science majors. In her "spare" time, she has been the Secretary and the Outreach Chair for the Actuarial Science Club, and has been involved in and led several Club initiatives, including introducing financial literacy programs into Illinois high schools, and developing relationships and activities between actuarial science programs at regional universities. Sarah was recently elected the President of the Actuarial Science Club. Her energy, administrative skills, and creativity ensure an active and expanding Club agenda, and form the basis for a very promising actuarial career.

Dr. Lois M. Lackner Mathematics Scholarship

The Dr. Lois M. Lackner Mathematics Scholarship was established in 2007 through a generous gift by Dr. Lois Lackner, a University of Illinois alumna with degrees in the teaching of mathematics and in education.

The 2013 recipient of the Lackner Scholarship is Danni Sun. Danni is a sophomore in mathematics with a minor in business. She has been taking honors courses in math since her first semester and is maintaining a very high GPA. Even more impressive is the research experience that she has gained (and is gaining) through the Illinois Geometry Lab and Math 496 – Introduction to Research. Great things are expected of her in the future.

Elizabeth R. Bennett Scholarship

The Elizabeth R. Bennett Scholarship, established in 1972, is given to freshmen as well as students at the sophomore or junior level and serves as a gateway to "senior" awards such as the Most Outstanding Major Award or the Brahana Prize. Many recipients of those latter awards started out by earning the Bennett Scholarship.

The winners of the Elizabeth Bennett Scholarship in 2013 are Yiwang Chen, Jiahuan Chen, J.D. Quigley, Feng Liang, Warren D'Souza and Daniel Hirsbrunner. Yiwang, J.D. and Feng are sophomores with junior standing and Jiachuan is a freshman with sophomore standing. Yiwang and Feng are James Scholars. All have GPA's above 3.85. Warren is an incoming freshman and will receive a renewal of the scholarship in 2013–14 given satisfactory progress. Daniel was awarded the Bennett Scholarship during his freshman year in 2011–12 and an additional year was awarded for 2012–13. Daniel also received the Emily Mann Peck Scholarship and a Vincent O. Greene Scholarship this year. That these students are winners of the Bennett Scholarship indicates a very promising future for our students.

Elsie Thomas Fraser Award

The Elsie Thomas Fraser Award was established by Elsie Thomas Fraser (BA in Science and Letters, 1939) and her husband, Edward (BS in Civil Engineering, 1939). The Elsie Thomas Fraser Award is for freshmen demonstrating academic excellence in the Department of Mathematics.

Jack Wagner is the 2013 recipient of the Elsie Thomas Fraser Award. He is a freshman with sophomore status. He has a perfect GPA from his first semester and at the same time earned an additional 18 credit hours through proficiency exam scores. We need to keep our eyes on him for future awards.

Record participation at math contest events

Illinois has a long tradition of promoting participation in math contests and related activities and has one of the most visible and extensive math contest programs in the country. Its offerings include informational sessions; weekly training sessions and practice contests; three local math contests with significant prize purses; a "UI Putnam Newsletter" with announcements about upcoming events; and the UI Math Contests website, www.math.illinois.edu/contests.html, a popular website with information about contest activities and an extensive collection of practice materials, links, and resources. The activities are organized by Professor A.J. Hildebrand and graduate student M. Tip Phaovibul.

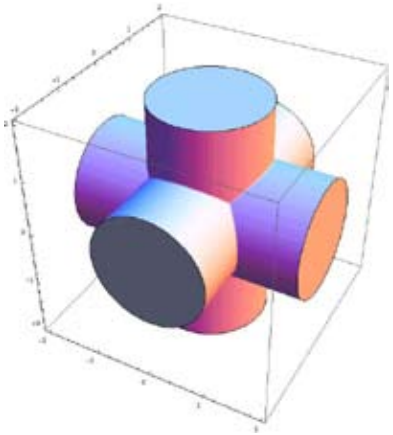
The UI Math Contest Program has been significantly expanded over the past two decades and continues to enjoy unprecedented popularity. The first event of the 2012–13 academic year, an informational meeting held in early September, attracted some seventy students, by far the largest crowd ever for this event. More than fifty new students have asked to be put on the "UI Putnam Mailing List" for upcoming math contest events, bringing the total number of students on the list to well over two hundred, an all time high. New attendance records were set at the 2012 UI Fall Math Contests and the 2012 Putnam Exam.

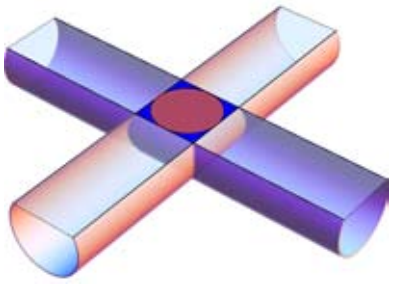
The first two major events of the 2012–13 contest season were the UI Freshman Math Contest on September 24, 2012, and the UI Mock Putnam Exam, held on September 26, 2012. A combined total of fifty-eight students participated in these contests, easily beating the previous year's record turnout of fifty students.

The UI Freshman Math Contest is a recent addition to our math contest program that was first offered in 2011. Restricted to Freshmen, this contest provides incoming students an opportunity to show their problem solving skills in direct competition against their peers. This year's edition attracted twenty-seven students, five more than at the previous year's inaugural event. Chong Han, a Freshman in Physics, was the winner of this contest and the recipient of the $300 top prize, earning a perfect score of 60 points. Honorable Mentions went to the second and third place finishers, Luvsandondov Lkhamsuren, a Freshman in Computer Science, and Zubin Pahuja, a Freshman in Physics.

IGL members present research at conferences

During the past semester, undergraduate student members of the Illinois Geometry Lab (IGL) have been out in force presenting research resulting from their IGL projects at local, regional, and national conferences. Altogether, IGL student members gave thirteen conferences presentations during the Spring 2013 semester, garnering a "Best Presentation" award and two "Best Poster Honorable Mentions" in the process.





On February 22-24, 2013, IGL student members Lingyi Kong, Nishant Nangia, Abigail Turner, and Ananya Uppal, traveled to the University of Texas at Austin to give three 20 minute talks at the inaugural Texas Undergraduate Geometry and Topology Conference on their IGL projects directed by Professors A.J. Hildebrand and Jeremy Tyson. Funding for the trip was provided by the conference organizers and the UI Department of Mathematics.

Closer to home, eight IGL students—Brian Freidin, Rob Halliday, Daniel Hirsbrunner, Moon Lee, Luvsandondov Lkhamsuren, Natawut Monaikul, Maxim Sigalov, Ananya Uppal—made a trip to Terre Haute, IN, to attend the Rose-Hulman Institute of Technology Undergraduate Mathematics Conference, on April 18-19, 2013, giving five 20 minute talks on IGL projects directed by Professors Stephanie Alexander, A.J. Hildebrand, and Bruce Reznick. This is the largest Illinois contingent at this conference in recent history. Lkhamsuren, a freshman in Computer Science and member of Hildebrand's IGL team "*n*-dimensional integrals", won the Best Presentation Competition at this conference. His talk, "Random Points, Broken Sticks, and Triangles," was based on research the IGL team, consisting of him, Lingyi Kong, Abigail Turner, and Ananya Uppal, had been involved with during the past year.

In addition to participating in these external conferences, the IGL had a strong presence at the University of Illinois Undergraduate Research Symposium on April 18, 2013, with five poster presentations on IGL projects directed by Professors Yuliy Baryshnikov and A.J. Hildebrand. Two of these posters received a "Best Poster Honorable Mention" award, a significant recognition representing approximately the top ten percent of all posters presented. The award-winning posters are: "Do Numbers Play Dice? Visualizing Order and Chaos in Number Theory Through Random Walks" by Yiwang Chen, Wenmian Hua, Natawut Monaikul, Tong Zhang, and graduate student M. Tip Phaovibul of Hildebrand's IGL team "Number-theoretic random walks"; and "Intersecting Cylinders: From Archimedes and Zu Chongzhi to Steinmetz and Beyond" by Lingyi Kong, L.J. Lkhamsuren, Abigail Turner, and Ananya Uppal, of Hildebrand's IGL team "*n*-dimensional integrals".

The UI Mock Putnam Exam is a long-running local version of the infamous William Lowell Putnam Mathematical Competition, or "Putnam", which has been called the "world's toughest math test" by *Time Magazine*. The exam consists of six challenging math problems, similar in nature to problems on Putnam contests, but a bit easier. Brian Freidin, a senior in Mathematics, and Danyang Zhuo, a senior in Electrical Engineering, emerged as co-winners of this year's Mock Putnam Exam. They each received $300 in prize money. Freidin was the winner of the 2012 UI Undergraduate Math Contest, Zhuo placed third in last year's Mock Putnam Exam, and both shared the top prize at the 2011 UI Undergraduate Math Contest. Wenmian Hua, a junior in Electrical and Computer Engineering and co-winner of last year's Mock Putnam Exam, received an Honorable Mention for placing third.

The main contest event in the spring semester is the UI Undergraduate Math Contest. This year's edition was held on March 2, 2013. The winner, and recipient of the $300 First Prize, was Danyang Zhuo, who turned in perfect solutions to five of the six contest problems. With this win, Zhuo ran the tables on this year's contests, earning the highest scores in all three contests he participated in. The runner-up, and recipient of the $200 Second Prize, was Zehan Chao, a Freshman in Mathematics and Computer Science. Participating in his first local math contest, Zehan solved four out of six problems and had a score of 39 points, more than 20 points ahead of the next highest scorer.

The annual highlight of the contest season is the William Lowell Putnam Mathematical Competition, a national math problems contest held simultaneously at colleges across the U.S. and Canada and the most prestigious contest of its kind. This year's Putnam Competition was held on December 1, 2012. Twenty-eight UI students participated, a new record for local turnout at the Putnam. The UI Putnam Team placed 22nd out of 578 participating colleges in the U.S. and Canada. In the individual competition, Danyang Zhuo had the highest score among local participants, placing 120nd among the more than 4000 participants. Three other local students made the "Top 500" list, a standard benchmark for excellence on the Putnam that corresponds to approximately the top 10 percent of all participants: Brian Freidin, David Goldstein, and Feng Liang.

For more information about UI Math Contest Program visit the contest website at http://www.math.illinois.edu/contests.html.

Waves in water, from ripples to tsunamis and to rogue waves

by Vera Hur

The motion of a fluid can be very complicated, as we know whenever we see waves break on a beach, fly in an airplane, or look at a lake on a windy day. Euler in the 1750s proposed a mathematical model of an incompressible fluid. His equations and its variants—the most notable one was introduced by Navier and Stokes to allow for the fluid to be viscous—are concise and capture in an idealized fashion the essence of fluid behavior. After the efforts of the Bernoullis and D'Alembert, Euler's work represented a crowning manifestation of the eighteenth century's confidence in the mathematical foundations of the laws of nature.

Since Euler's time, the theory of fluids has stimulated developments in several branches of mathematics—partial differential equations (PDEs), dynamical systems, spectral theory, probability, among others. For instance, it was the main motivation for Cauchy to develop his complex function theory. Furthermore, hydrodynamics has impacts outside mathematics, from weather prediction to exploding supernovae. Of course, an immense amount of progress has been made over the past two and a half centuries. But there are many problems that are still beyond our reach. For example, global existence for the Navier-Stokes equations in three dimensions is a Clay Millenium Problem.

Waves and jets and drops come to mind when thinking of fluids. These objects involve one or two different fluids separated by an unknown ("free") surface. In the PDE community these problems go by the name of "free boundary problems." Free surfaces are mathematically challenging in their own right and they occur in numerous physical situations, such as the melting of ice (the free surface being the boundary of the ice) and the stretching of a flexible membrane over an obstacle (the free surface being the boundary of the contact region).

The water wave problem in the simplest form concerns wave motions at the interface separating in two or three dimensions a flow of water below a body of air, acted upon by gravity and possibly surface tension. Describing what we see or feel at a beach or in a boat, water waves are a perfect specimen of applied mathematics. They host a wealth of wave phenomena, ranging in length scale from ripples driven by surface tension to tsunamis and to rogue waves. Furthermore, a considerable part of the theory of wave motion has been pioneered on the basis of studies of water waves, e.g. integrable PDEs. Water waves, notwithstanding, present profound and subtle difficulties for rigorous analysis, modeling and numerical simulations. For one thing, the interface between the air and the water is a free surface. To make things worse, boundary conditions at the fluid surface are severely nonlinear. To quote Richard Feynmann, "...(water waves) which are easily seen by everyone ... are the worst possible example.... They have all the complications that waves can have."

I study mathematical aspects of water wave phenomena, specifically, (1) is there a unique solution to the Cauchy problem for arbitrary initial conditions? for how long a time does it exist? (2) are the solutions regular or do singularities develop after some time? (3) are there solutions spatially periodic? are they dynamically stable? (4) can we characterize steady water waves? (5) What is the effect of surface tension? of boundaries? Particular emphasis is on the large scale dynamics and genuinely nonlinear behaviors, such as breaking and peaking, an acute understanding of which ultimately hinges upon a direct study of the governing equations. The complexity of the system habitually prevents a detailed account, however, and at times approximation models are studied, obtained under various simplifying assumptions. Perhaps the best known is the Korteweg-de Vries equation, modeling the unidirectional propagation of small-amplitude and long-wavelengths waves in a channel. Further advances in studies of water waves call upon a fruitful interaction between the conceptual and computational framework in addition to observation and physical verification via laboratory experiments and field data.

Vera Hur

Vera Mikyoung Hur is an Assistant Professor in the Department of Mathematics at the University of Illinois at Urbana-Champaign. She completed her PhD in 2006 at Brown University in Providence, RI, under the direction of Walter Strauss. She was a C.L.E. Moore Instructor at MIT before joining the department in 2009. Her research interests are in analysis (pure and applied) and partial differential equations. Currently, she focuses on surface water waves and free boundary problems arising in fluid mechanics, geophysics and materials. Hur was named a 2012 Sloan Research Fellow.

Learn more about Hur on her website at http://www.math.illinois.edu/~verahur/.

AWM organizes first annual Sonia Math Day for Girls

The first annual Sonia Math Day for Girls was comprised of fun hands-on workshops, an interesting keynote address, and an informative panel discussion on careers in mathematics. The event, held on May 18, 2013, was designed by the local chapter of the Association for Women in Mathematics (AWM) to encourage high school girls in the Urbana-Champaign area to pursue mathematics.

The 2013 theme was "To Catch an Art Thief in Königsberg." The day was built around the premise that several valuable art sculptures were stolen from a museum in Königsberg. The participants helped the police efficiently search the bridges of Königsberg for the culprit in the first hands-on workshop. This involved learning about the theory of graphs and Euler circuits. In the second hands-on workshop, the participants reconstructed the sculptures of platonic solids that were stolen. In the process of the reconstruction, they studied the solids and learned about the Euler characteristic. Tying in with the theme for the day, the keynote address "The Math Behind NUMB3RS" and was delivered by an UI alumna, Dr. Sylvia Carlisle. The Sonia Math Day also included a panel discussion on careers in mathematics. Panelists were Dr. Kimberly Meyer (actuary at Mercer in Louisville, Kentucky), Dr. Sylvia Carlisle (assistant professor at Rose-Hulman Institute of Tech., Terre Haute, IN), Betsy Sudlow (high school math teacher, Centennial HS, Champaign, IL), and Anna DeJarnette (UI PhD student in Curriculum and Instruction).

This event was supported by the UI Department of Mathematics and the Illinois Geometry Lab and the National Science Foundation.

Department hosts first PhD alumni reunion

The Department of Mathematics at Illinois held its first-ever reunion for PhD alumni on March 1-2, 2013. PhD alums gathered to reconnect with former classmates and teachers. Alumni also had an opportunity to meet with our current graduate students.

Activities included a panel discussion for current graduate students about academic and nonacademic career paths. Panelists were alumni Evan Fisher, Lafayette College, Easton, PA; Tryggve Fossum, Intel Corp.; David Perry, National Security Agency; and Carla Savage, North Carolina State University.

Saturday activities began with a breakfast and lecture "Meet Alice and Bob in Math" presented by Professor Marius Junge. Junge's presentation was an opportunity for the group to work through some computer science jargon and to try to understand what it means to ask quantum questions and quantum answers and then learn about the connections to the work of Grothendieck and what is called the operator space version of Grothendieck's inequality. Matthew Ando, Chair of the department, gave a brief presentation about the current state of the department. Responding to a feedback survey alumnus Ciprian Demeter said, "It was nice re-connecting with faculty and learning about the recent developments in the department."

In the afternoon, alumni had an opportunity to visit the Altgeld Chimes Tower for a tour and many took the opportunity to learn to play the chimes. Alumni also took a facilities tour of Altgeld and Illini Halls. Alumnus Tryggve Fossum said, "It was a stroll down memory lane, reminding me of the good times I had in Champaign-Urbana."

Photo by Andrew Stengele.

Alumni (with year of PhD) who attended the reunion, pictured from left: Peter Yff (1957), Evan Fisher (1981), Vladimir Drobot (1967), Chaoyuan Mary Liu (2005), Charles W. Neville (1972), Carla Purdy (1975), Thomas Kratzke (1988), George Purdy (1973), Douglas W. Townsend (1976), Ciprian Demeter (2004), Jonell Duda Comerford (1977), Carla Savage (1977), Leo Comerford (1973), Peter Braunfeld (1959), Tryggve Fossum (1972), David Perry (1999). Not pictured: Ming Kou (2007), Jaebum Jung (2008), Marvin Israel (1974).

NEWS

Kirkpatrick receives NSF Career Award

Assistant Professor Kay Kirkpatrick has been awarded a five-year National Science Foundation (NSF) CAREER award entitled "Statistical mechanics of superconductors and other macroscopic phenomena." She works at the interface between probability and partial differential equations, with applications to physics and biology. Recent results of hers include a central limit theorem for quantum many-body dynamics and asymptotics for the magnetization of the classical Heisenberg model.

The NSF Faculty Early Career Development Program recognizes and supports the early career-development activities of those teacher-scholars who are most likely to become leaders of academic research and education in the 21st century. Awardees are selected on the basis of creative, career development plans that effectively integrate research and education.

Zaharescu appointed CAS Associate

Professor Alexandru Zaharescu received an appointment as an Associate in the Center for Advanced Study for the 2013–2014 academic year and will use this appointment in Fall 2013. During that time he will work with Professor Bruce Berndt on the connection between the circle problem and the Dirichlet divisor problem, which are two long outstanding questions in analytic number theory, and certain double series of Bessel functions. The connection is made explicit in two formulas discovered by Ramanujan. In previous work, Professor Zaharescu, Professor Berndt, and Sun Kim, a former graduate student at Illinois, succeeded to prove one of these formulas. The main goal of this research project is to prove the second, more difficult, formula of Ramanujan.

Balogh named Simons Fellow

Associate Professor Jozsef Balogh has been named a 2013 Simons Fellow by the Simons Foundation Divison for Mathematics and Physical Sciences. Balogh (PhD 2001, U. of Memphis) works in extremal and probabilistic combinatorics. His recent interests include studying the structure of sparse discrete structures.

Nineteen UI mathematicians named AMS Fellows

At its annual meeting in January 2013, the American Mathematical Society recognized its inaugural class (2012) of Fellows of the American Mathematical Society. The new Fellows program recognizes members who have made outstanding contributions to the creation, exposition, advancement, communication, and utilization of mathematics. The Society has a total membership of more than 30,000, and the inaugural class includes approximately 1,200 fellows representing more than 600 institutions.

The inaugural class of Fellows of the AMS includes nineteen mathematicians from the University of Illinois at Urbana-Champaign. They are Professors Bruce Berndt, Nathan Dunfield, Kevin Ford, Ilya Kapovich, Sheldon Katz, Bruce Reznick, and Jeremy Tyson; and Emeritus Professors Kenneth Appel, Richard Bishop, Donald Burkholder, Harold Diamond, Robert Fossum, Heini Halberstam, Peter Loeb, Howard Osborn, Anand Pillay, Paul Schupp, Philippe Tondeur, and John Walter.

Only 62 institutions worldwide had five or more fellows. The selection of nineteen mathematicians from Illinois for this honor is a signal of the vitality of the department, its distinguished history and exciting future.

"The new AMS Fellows Program recognizes some of the most accomplished mathematicians—AMS members who have contributed to our understanding of deep and important mathematical questions, to applications throughout the scientific world and to educational excellence," said AMS President Eric M. Friedlander.

For more details on the fellows program, visit http://www.ams.org/profession/ams-fellows.

Student mentors essential to NetMath's success

The Department of Mathematics has long been a national leader in distance education through its NetMath program. NetMath's success is due in part to its peer mentoring structure.

Besides educating students enrolled in online mathematics courses, NetMath provides mentors with valuable professional development experience. In addition to over 400 active students, NetMath employs more than 30 mentors. Most of our mentors are undergraduate students at the University of Illinois who have successfully completed multiple NetMath and/or Calculus & Mathematica-based courses. They provide NetMath with a peer mentoring structure that is unique to our program.

Mentors are an essential resource for NetMath students—they guide students through courses by grading homework assignments, answering questions on course material, and helping students stay on schedule to successfully complete the course. Mentors also provide students with a connection to the University of Illinois. Our students greatly benefit from having dedicated mentor assistance throughout their time in a NetMath course.

Through their work with NetMath, our mentors gain a deeper understanding of mathematical concepts, get extensive experience with *Mathematica*, and gain valuable training in online teaching and learning. They work with new technology in online course delivery systems, including multiple learning management systems, online chat rooms, and online course discussion forums. Mentors also learn useful skills such as time management, professional communication, and discipline.

An added benefit our mentors experience through their work for NetMath is the satisfaction of a job well done. Our mentors truly value the feedback they get from students. Mentors are proud representatives of the NetMath program and the University of Illinois to our diverse student body throughout the world.

Kenneth I. Appel

Kenneth I. Appel, 80, of Dover, New Hampshire, and formerly of Urbana, died Friday, April 19, in Dover after a short hospitalization. He had been diagnosed with esophageal cancer in October. Funeral services were held on April 22 in Dover.

Photo by Carole S.Appel, 2007.

Kenneth Appel

From 1961 to 1993 he was a mathematics professor at the University of Illinois, where he and his colleague Wolfgang Haken solved one of the most famous problems in mathematics, the Four Color Conjecture. They answered this question: Is it true that any map can be colored with just four colors so that contiguous countries have different colors? Their proof that four colors are sufficient, announced in 1976, was the first major mathematical theorem to be proved with the aid of a computer. This solved a problem first posed in 1852 by Francis Guthrie which had been attacked without success by many mathematicians.

Kenneth Ira Appel was born in Brooklyn, NY, on October 8, 1932, and grew up in Queens, NY, the son of Irwin Appel and Lillian Sender Appel. He received a bachelor's degree in mathematics from Queens College in 1953. After working briefly as an actuary, he served two years in the U.S. Army, at Fort Benning, Georgia, and in Baumholder, Germany.

He received his PhD in mathematics from the University of Michigan in 1959. In Philadelphia that year he married Carole S. Stein. They moved to Princeton, NJ, where Ken worked for the Institute for Defense Analyses, doing research in cryptography.

After joining the University of Illinois at Urbana, he taught mathematics and did research on group theory and computability theory. In the 1980s he served as Associate Chair of the department of mathematics and directed the program in actuarial science. He also served on the Urbana city council and later on the city's zoning board.

In 1993, he retired from the University of Illinois to chair the mathematics department of the University of New Hampshire. In New Hampshire he also served as treasurer of the county Democratic Committee and a member of the Dover school board. He retired from the University of New Hampshire in 2003.

The solution of the four-color problem by Ken Appel and Wolfgang Haken was reported in the press world-wide, including *Time Magazine* and *Scientific American*. The *New York Times* wrote in 1976, "Now the four-color conjecture has been proved by two University of Illinois mathematicians, Kenneth Appel and Wolfgang Haken. They had an invaluable tool that earlier mathematicians lacked—modern computers. Their present proof rests in part on 1,200 hours of computer calculation during which about ten billion logical decisions had to be made. The proof of the four-color conjecture is unlikely to be of applied significance. Nevertheless, what has been accomplished is a major intellectual feat. It gives us an important new insight into the nature of two-dimensional space and of the ways in which such space can be broken into discrete portions." Wolfgang Haken remembers that it was "the remarkable attitude of Ken's that made everything possible."

In 1979 the American Mathematical Society and the Mathematical Programming Society awarded the Delbert Ray Fulkerson prize to Appel and Haken. In 2012 Ken was elected a Fellow of the American Mathematical Society.

Ken Appel was passionate about mathematics education, at all levels from elementary school to graduate school. At every stage of his life, he sought opportunities to teach—as a graduate student in Michigan, as a volunteer lecturer at Princeton University, in more than fifty years as a professor, and in retirement as a volunteer in mathematics enrichment programs in Dover and southern Maine public schools. He particularly believed that students should be afforded the opportunity to study mathematics at the level of their ability, even if it is well above their grade level. To that end, he enjoyed working with gifted high school students on the kind of math problems he would give to his graduate students.

He was an avid tennis player until his fifties, a serious swimmer, a lifelong stamp collector, a skillful player of the game of Go, a baker of bread. He was a loving husband, father, and grandfather.

Kenneth Appel is survived by his wife Carole S. Appel, son Andrew W. Appel and his wife Maia Ginsburg, of Princeton, NJ; son Peter H. Appel and his wife Bárbara Zamora-Appel, of Alexandria, VA; by grandchildren Avi and Joseph Appel, Rebecca and Nathaniel Weir, and Carmen Appel; and his sister Lois Green and her children.

Carole and Ken's daughter Laurel F. Appel, a biologist at Wesleyan University, died on March 4 this year at the age of 50 and is survived by her husband, Michael P. Weir.

Contributions in Kenneth Appel's memory can be made to the Laurel F. Appel Fund for Student Research, Wesleyan University, c/o M. Herlihy, 318 High St., Middletown, CT 06459, or online at give.wesleyan.edu, specifying that the gift is for the Laurel Appel Fund.

At City Hall in Dover, NH, city officials lowered the city of Dover flag to half staff in honor of Ken Appel during the week of his death.

IN MEMORIAM

Paul T. Bateman

Paul T. Bateman, 93, died Wednesday, December 26, 2012. He was born in Philadelphia in 1919, the son of Anna and Harold Bateman, and grew up in Philadelphia. He attended the University of Pennsylvania as an undergraduate and graduate student, with an interruption of four years during World War II, when, as a conscientious objector, he worked in a mental hospital in Middletown, CT.

Paul Bateman

Paul received his PhD in 1946 at the University of Pennsylvania under the supervision of Hans Rademacher. The main result of his thesis was the proof of a formula conjectured by G. H. Hardy for the number of representations of a positive integer as the sum of three squares. This was an old and challenging problem that was solved by a delicate analysis. Paul's paper, published in the *Transactions of the American Mathematical Society*, has been repeatedly cited and has inspired much further study.

After holding two-year postdoctoral positions at Yale University and at the Institute for Advanced Study, he came to the Department of Mathematics at the University of Illinois in 1950. Paul was on the Illinois faculty until retiring in 1989, and he remained active until shortly before his death.

From 1965 to 1980, Paul served as Department Head and oversaw major expansion and faculty renewal. His achievements as head were many; in particular, he raised the level of the whole department and built an outstanding number theory group. His energetic leadership had a positive effect on number theory throughout the nation—he had both good ideas and the drive to carry them out.

Paul was a member of the American Mathematical Society for 71 years. He gave extensive service to the AMS as an Associate Secretary and a member of the Board of Trustees and the Mathematical Reviews Committee. Paul did much of this work during the time of his headship while still maintaining an active research program and advising graduate students—he had a great capacity for work.

Paul married Felice Davidson in 1948. Their daughter, Sarah (Sally to all of us) was born in Urbana and continues to live here.

The focus of Paul's research was classical analytic number theory and associated analysis. Paul was a walking encyclopedia of mathematical literature. He put this to good use in writing an authoritative appendix for the reprint of Landau's groundbreaking book *Primzahlen*. Paul supervised 20 PhD students and wrote joint articles with 20 mathematicians. He is perhaps best known to the world's number theory community for formulating the Bateman-Horn conjecture on the density of prime number values generated by systems of polynomials. This topic has been discussed in dozens of research papers.

One of Paul's mathematical enthusiasms was problem solving. He inspired generations of students with problem-based courses that he taught, and several books were enriched by problems that he contributed. Shortly after retiring, Paul was appointed coeditor of the Problems Section of the *American Mathematical Monthly,* where his accomplishments included cleaning up a backlog of unsolved problems and, as he put it, "keeping egg off our faces."

Paul organized and promoted Illinois Number Theory Conferences, first as regional meetings, and now as a frequent international event. In recognition of this contribution, the department celebrated Paul's 70th birthday and retirement with a three-day meeting at the University of Illinois Conference Center at Allerton Park. The proceedings of this conference were published by Birkhäuser.

The Batemans enriched both the Illinois Mathematics Department and number theory through their many social events. These included the annual fall cookout with Paul at the grill, parties for visiting speakers, and the popular daily lunches at the Illini Union. Paul maintained a large worldwide network of colleagues, including Hubert Delange from France; John Selfridge from Urbana, Ann Arbor and DeKalb; Paul Erdös from all over; and many former students. Paul and Felice were supportive of the Mathematics Department in other ways. They, along with Selfridge, created a permanent endowment for a prize and a fellowship in the Mathematics Department that are named in Paul's honor.

Paul supported the department in other, unique ways. There were intramural sports: the P. T. Batsmen softball team and the cross country competition in which the Math runners sported bright orange Math Reviews T-shirts. (The race ended with a chicken dinner at the Batemans' home.) Then there was the coveted departmental award for the most tardy submission of term grades. The "prize" was to buy a round of beer after the first colloquium of the following term. Originally called the Selfridge Award, after its first winner, a victory by Paul led to its being renamed the Bateman-Selfridge Award. Then in honor of the reigning pope, it was re-renamed the John-Paul Award.

Among his outside interests, Paul loved classical music and opera and he enjoyed such outdoor activities as yard work and exploring mountains on foot and back roads by car. The trips, usually connected with mathematics conferences, always included his family. Paul will be remembered by his colleagues and acquaintances for his guidance, support, encouragement, and friendship.

Memorial contributions may be made to the Paul T. Bateman Number Theory Fellowship Fund, c/o the University of Illinois Foundation.

Number Theory at Illinois: A Conference in Honor of the Batemans

A Number Theory Conference honoring Paul and Felice Bateman will be held at the Department of Mathematics, University of Illinois at Urbana-Champaign, June 5–7, 2014. Twenty invited talks and more contributed talks are planned. This meeting continues a long tradition of conferences organized by the Number Theory group in the Department of Mathematics. The Number Theory Conference will be preceded by a Graduate Student Conference in Number Theory on June 3–4, 2014. Visit the conference website www.math.illinois.edu/nt2014/ for more information.

Felice D. Bateman

Felice Bateman

Felice D. Bateman, 90, died February 4, 2013, at Carle Hospital, in Urbana.

Felice was born in Springfield, Mass. on Sept 2, 1922, the daughter of Joshua and Minna Kohn Davidson. Survivors are her daughter Sarah (Sally) Bateman of Urbana, brother David S. Davidson of Bethdesda, MD, a nephew and grandnieces.

Felice graduated from Smith College and, with encouragement from Professor Deane Montgomery, went on to graduate study in mathematics at the University of Michigan. She earned her PhD, awarded in 1950, with a thesis in algebra written under the direction of Robert Thrall. Another intervention by Montgomery led to meeting her future husband, Paul T. Bateman. Felice and Paul were married in Detroit, Michigan, on June 25, 1948. Their daughter, Sally, was born in 1951.

Felice taught at Douglass College in New Jersey during Paul's postdoctoral stay at the Institute for Advanced Study. When the Batemans came to the University of Illinois in 1950, nepotism laws were in effect that prevented employment of more than one member of a family. This led to Felice being employed on a "temporary" basis for eleven years until 1965, when she received a regular appointment. She retired from the Mathematics Department faculty in 1989.

Felice was a lover of classical music, and until the last few years, the Batemans were season ticket holders at the Chicago Lyric Opera. Also, the Batemans were enthusiastic travelers, with Boulder and Estes Park, Colorado, among their favorite places. On one trip, to Vancouver, B.C., Felice fell and broke a hip. The resulting surgeries slowed her down, and over the years, walking became increasingly hard, but she kept up her good spirits.

Felice contributed to life in the Mathematics Department by being welcoming and helpful to newcomers and guests, both domestic and international. She served as hostess for many departmental functions during Paul's tenure as head. Felice was a helpful agent also when Paul was an Associate Secretary of the American Mathematical Society and was cited for her work on the AMS volume *A Century of Mathematical Meetings*.

Memorial contribution may be made to the Paul T. Bateman Number Theory Fellowship Fund, c/o the University of Illinois Foundation.

Robert W. Carroll

Robert Carroll

Robert Wayne Carroll, 82, died Dec. 8, 2012, at Carle Foundation Hospital in Urbana. He was born May 10, 1930, in Chicago to Walter Scott Carroll and Dorothy Helen LeMonnier.

He received his undergraduate degree in applied mathematics at the University of Wisconsin (Madison) in 1952. He was an aeronautical research scientist (GS9) at Lewis Flight Propulsion Laboratory in Cleveland, which was part of NACA (now NASA) between 1952 and 1954. He served for three years with the U.S. Army Security Agency as a linguist in Russian, Polish, German, and French.

He returned to the States in 1957, received his PhD degree in mathematics from the University of Maryland in 1959, and became an NSF postdoctoral Fellow at Nancy, France. He was an assistant professor (1960-1963) and associate professor (1963-1964) at Rutgers University. He became an associate professor in 1964 at the University of Illinois. He was promoted to full professor in 1967 and held that position for 30 years until his retirement in 1997.

Professor Carroll specialized in partial differential equations, ordinary differential equations, mathematical physics, and global analysis. His work considered topics such as soliton theory, transmutation theory, inverse scattering and integrable systems. He was the author of 12 books and several hundred papers in the above areas.

During his career, he held visiting positions at the University of Maryland, the University of Witwatersrand (South Africa), Academia Sinica (Taiwan), Hiroshima University (Japan) and the Institute for Mathematics and its Applications at the University of Minnesota. He gave invited talks at more than 80 conferences and lectured in England, Holland, France, Italy, and Japan. He also served as an associate editor for the journal *Applicable Analysis*.

He remained active well past retirement. He was awarded the Majorana Prize in 2010 from the *Electronic Journal of Theoretical Physics* for the Best Special Issue Paper, "Quantum potential as information: a mathematical survey."

He is survived by his wife, Denise Bredt. He is also survived by two sons, David and Malcolm (from his first marriage to Berenice Carroll), and four grandchildren, Katherine, Annette, Sophie and Max Carroll. He will be buried next to Joan Miller, to whom he was married from 1979 until her death in 2001.

Professor Carroll had a number of hobbies. He enjoyed traveling and learning languages leading to varying degrees of skill in Chinese (Mandarin), French, German, Italian, Japanese, Polish, Russian, Spanish, and Turkish. He was an enthusiastic bridge player and was an avid tennis player for most of his life. Other interests included ping pong and music.

Condolences may be sent to 2120 S. Vine St., Urbana, IL, c/o David Carroll. Any donations in the name of Robert W. Carroll should be made to the American Cancer Society.

IN MEMORIAM

Donald Burkholder

Donald Burkholder

Donald Lyman Burkholder, a renowned mathematician who helped to revolutionize interdisciplinary studies in the areas of probability theory and analysis and who spent his entire career as a professor at the University of Illinois, died in his sleep on Sunday, April 14, in Urbana, Illinois. He was 86.

He was born January 19, 1927, in Octavia, Nebraska, the fourth of five children of Elmer and Susan (Rothrock) Burkholder. His mother had been a schoolteacher, and his father was a farmer who served on the community school board for many years. Education became the family business: of the four boys, the oldest was a superintendent of schools, the three youngest were college professors, and many in the next generation are educators.

In 1945, Don graduated from high school, where he was captain of the basketball team and senior class president, an honor (as he loved to relate) that came his way because his three classmates had all been president already. He was drafted and entered the Civilian Public Service as a conscientious objector, serving as a cook at a camp for fighting forest fires in Oregon and as an orderly at a mental hospital in New Jersey.

Following his discharge in December, 1946, he acted on the recommendation of a friend and enrolled at Earlham College, a predominantly Quaker college in Richmond, Indiana. There he met his wife-to-be, Jean Annette Fox, and they were both drawn to the field of sociology by the vision and intellectual rigor of a new faculty member who had also served in the CPS, Bill Fuson.

After their wedding in June 1950, Don and Jean attended the University of Wisconsin in Madison as graduate students in sociology. In 1953 they went to the University of North Carolina at Chapel Hill, where Don had a fellowship to study sociological statistics. He soon discovered that his real interest lay in mathematics, and he completed a PhD in statistics in 1955 under the guidance of Prof. Wassily Hoeffding. That summer, Don joined the Mathematics Department at the University of Illinois in Urbana, where he became a professor in 1964. In 1978 he was appointed Professor in the University of Illinois' Center for Advanced Study. Don retired as professor emeritus in 1998.

Soon after he came to Illinois, Don, influenced by his eminent colleague Joseph Doob, turned to the study of martingales and their connections to other areas of mathematics. The term "martingale" is used in the discipline of probability to describe a fair gambling game, in which the fortunes of the gambler and the house are equally weighted. It is a matter of balance. As Don liked to point out, the study of martingales is like studying certain properties of Alexander Calder's mobiles, artworks whose parts hang in perfect balance.

It is now widely recognized that the concept of balance embodied in martingales is central for a large number of objects in mathematical fields seemingly unconnected to probability. Don's research, including a fruitful set of papers with his collaborator Richard Gundy, profoundly advanced martingale theory and drove a revolution in the last third of the twentieth century that elevated probability theory to a major role in the study of analysis and differential equations.

In his five-decade career, Don gave several hundred invited lectures and lecture series in England, France, Germany, Switzerland, Israel, Denmark, Sweden, Poland, Hungary, Japan, Singapore, Italy, Scotland, Spain, and Canada and at universities across the United States. He was editor of the *Annals of Mathematical Statistics* (1964–1967), president of the Institute of Mathematical Statistics, a leading international society (1975–1976), and a member of many councils, advisory committees, and governing boards. He was a dedicated teacher and mentored 19 PhD students.

He was elected to the National Academy of Sciences in 1992, and was a Fellow of the American Academy of Arts and Sciences, the Society for Industrial and Applied Mathematics, and the American Association for the Advancement of Science. In December 2012, he was among the first class named as Fellows of the American Mathematical Society.

In his early years at the University of Illinois, Don was deeply influenced by his close colleague Joseph Doob. Half a century later, Don's last major effort as a mathematician was to edit a volume of mathematical articles in memory of Prof. Doob, which appeared in 2006. Subsequently Don's colleagues honored him in turn with a collection of his major articles (2011) and a volume of mathematical articles in his honor (2012).

Don was devoted to positive social change. During one summer in college, he volunteered in a community group advocating housing desegregation in Chicago while earning money in the Chicago steel mills, laying bricks in the furnaces. He worked for civil rights with the Fellowship of Reconciliation, founded by Bayard Rustin. Throughout his life, he contributed to organizations and political candidates who championed social justice, equal opportunity, and lifting individuals and communities at home and abroad out of the ravages of poverty. He shared these interests with his wife Jean, who has been active in the Urbana-Champaign community, working with the League of Women Voters and other organizations on housing, integration, urban planning, neighborhood preservation, and education, including service as the first chair of the Urbana Human Relations Commission and twenty-two years on the Urbana School Board.

Don is survived by his wife of almost 63 years, Jean Annette (Fox) Burkholder; his son J. Peter Burkholder and son-in-law P. Douglas McKinney of Bloomington, Indiana; his son William F. Burkholder, daughter-in-law Joanne (McLean) Burkholder, and granddaughter Sylvie Kathleen Burkholder of Singapore; his sister Helen Dale and brother-in-law Ernie Dale of Auburn, Washington; his brother John Burkholder and sister-in-law Donna Burkholder of McPherson, Kansas; his sisters-in-law Anne Burkholder of McPherson, Kansas, and Leona Burkholder of Madison, Wisconsin; and seventeen nieces and nephews. His daughter Kathleen Linda Burkholder died of a cerebral hemorrhage in 1981, and he was predeceased by his brothers Robert Burkholder of Buhler, Kansas, and Wendell Burkholder of Madison, Wisconsin.

Donations can be made to the Kathleen L. Burkholder Graduate Student Award Fund at the University of Illinois Foundation or for the Friends of the Urbana Free Library.

Department of Mathematics Giving Form

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Please consider the Department of Mathematics in your estate planning. These deferred gifts can provide an easy way to make a truly significant and lasting contribution to the department. If you would like to discuss giving opportunities, please contact Sheldon Katz, Mathematics Development Committee Chair, at (217) 265-6258, or Patrick Hayes, Senior Director of Development, at (217) 333-7108.

Illinois Math Reception

The 2014 Joint Mathematics Meetings will be held January 15–18, 2014, in Baltimore, MD. The Illinois Department of Mathematics will host a reception at the joint math meetings. Details will be posted soon. Visit www.math.illinois.edu/jmm-reception.html for more information.

Everyone ever connected with the department is encouraged to get together for conversation and to hear about mathematics at the University of Illinois.

Math Times

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IJM makes plans to resume publication schedule

by Renming Song, Editor-in-Chief

The *Illinois Journal of Mathematics* is pleased to announce that plans are in motion to resume regular publication schedules by early next year. While the *IJM* has been delayed for a period of time due to changes in copyediting and typesetting services and decreases in subscription income, the journal has recently positioned itself to increase production frequency from 4 to 6+ issues per year, allowing the journal to catch up to the current volume. At the same time, the *IJM* has continued to provide subscribers with a high quality, general mathematics journal at low cost, offering added value in the form of online content available at Project Euclid. Electronic only subscriptions are available at a discounted rate.

IJM is also pleased to announce the upcoming publication of a special issue consisting of articles that honor the mathematical contributions of John P. D'Angelo. D'Angelo came to the University of Illinois at Urbana-Champaign in 1978. He has made pioneering advances in the field of several complex variables, especially in the use of algebraic geometry in the study of mapping problems in CR geometry and in the theory of the Bergman projection. He is highly regarded as a researcher, lecturer, expositor, and author, currently nearing completion of his fifth book. *IJM* would like to give special thanks to editor, Steven Bradlow, and guest-editors Peter Ebenfelt, Jeremy Tyson, and Dror Varolin for their efforts in bringing this special issue to life.

More information about *IJM* is available at http://ijm.math.illinois.edu/.