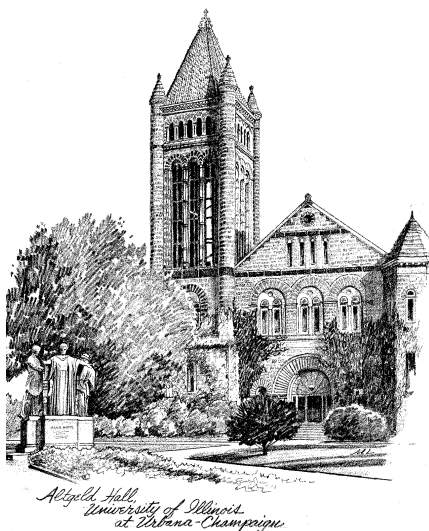


Math



Times

Department of Mathematics

Fall 2002

From the Department Chair

The fall has brought with it the excitement of the beginning of the academic year. New faculty members have arrived on campus. New graduate students have begun their studies and new undergraduate students are here taking their first university courses. The new term carries with it a sense of optimism. The renewal and sustaining of traditions in our department and university have taken energy from this attitude.

A new Undergraduate Mathematics Student Lounge was established this fall. It is in Altgeld Hall on the second floor, right above the front entrance to the building. A separate room inside the lounge has three computers for undergraduate student use. We are encouraging our undergraduate students to use the room to meet others, to study, and to make it a place to gather. Its proximity to the larger department commons room next to it guarantees access to coffee, tea, and the usual afternoon cookies. We hope this new space will be enjoyed and used frequently by our undergraduate students.

This fall we are having a fund raising drive. You may have received

a letter from us asking for your support for our programs. We are especially interested in increasing support for our Summer Group Research Experiences for Undergraduates program that had another successful run this last summer. See www.math.uiuc.edu/VIGRE/reu_report.html#summerreu for information about this program. But there are other aspects of what we do, most notably our excellent Actuarial Science Program, that also could well use your support. Later this year, we will know how successful this fund raising drive has been and will let you know more about it in the spring issue of the Math Times.

Our new honors mathematics sequence is off to an excellent start. Professor Joe Miles is teaching the first term's class. The curriculum is a challenging introduction to calculus and real analysis that includes many concepts and techniques not usually introduced in our undergraduate courses until the student is in much more advanced courses. At this time, there are two dozen undergraduate students in the class. We are all learning from this first experience with this new course sequence and are

very excited about its potential for the future.

The new Applied Mathematics Program has started up this year with a really interesting seminar being organized by Professor Hassan Aref (Department of Theoretical and Applied Mechanics) and Professor Robert Ghrist (a new associate professor in the Department of Mathematics). They have planned a rich and varied program of speakers with ample time for questions and interaction during the two hours reserved for these seminars on Monday afternoons. See www.math.uiuc.edu/~ghrist/amseminar.html for more information about this seminar sequence. To help develop the Applied Mathematics Program we are also planning regular gatherings for the participants around campus, and the program's Advisory Committee is meeting this fall to discuss the development of curriculum for students who want to pursue applied mathematics as part of their studies.

I send you greetings and wish you the very best in the coming year.

University of Illinois at Urbana-Champaign

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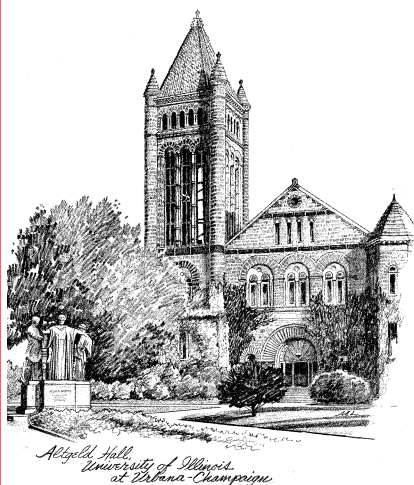
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King Broadrick-Allen Award

E. Graham Evans Jr., Undergraduate Programs Director of the UIUC Department of Mathematics, received the King Broadrick-Allen Award for Excellence in Honors Teaching this past spring. The King Broadrick-Allen Award is given by the Campus Honors Program (CHP). The award was made possible by Dr. Sandra Broadrick-Allen in honor of her husband King Broadrick-Allen, who was a professor of Speech Communication, Director of the James Scholar Program, and a longtime supporter of honors efforts at Illinois. Professor Evans was awarded the King Broadrick-Allen Award to recognize him as an instructor who goes above and beyond in teaching with creativity and profound effect, in mentoring CHP students, in supporting CHP special events, and in the hard work of reviewing applications to the CHP Program.

Woody Scholarship Award

Travis Gaertner, a student in the UIUC Department of Mathematics, has been awarded a Woody Scholarship for the coming year. This prestigious award is given by the Actuarial Education and Research Fund to only four students in the United States and Canada. Gaertner won this honor by means of his outstanding academic record here, in addition to athletic accomplishments (he was on the Canadian wheelchair basketball team that won gold at the Paralympics in Sydney, and recently went to Japan for the world championship games). He has also passed three of the professional actuarial exams, a level that many would be glad to attain within several years of graduation.

Barry M. Goldwater Scholar

David I. Smyth, an undergraduate student majoring in mathematics and physics at UIUC, has been named a 2002 Barry M. Goldwater Scholar. Smyth, who was awarded the UIUC Department of Mathematics H.R. Brahana award this past spring, spent last semester studying in the mathematics program in Budapest. His goal is to receive a Ph.D. in mathematics and physics and to combine pure and applied mathematical research, science policy analysis, and a love of teaching through a mathematics professorship at a major research university.

2002 UIUC Undergraduate Math Contest

Twenty students participated in the 2002 UIUC Undergraduate Math Contest, which took place on April 13, 2002. The first prize went to **Michael Baym**, who earned 50 out of 60 possible points. In second place was **Ken Scheiwe** with 44 points, followed by **Geoffrey Levine** with 40 points. In fourth place with 30 points, and the winner of the Rookie Award, was **Simina Boca**, a high school student who is already taking advanced math classes at the University of Illinois. The next-highest scorers were **James Koerber** (30), **Tyler Smith** (29), **Gabriel Lerner** (28), **Derrick Cheng** (24), and **Louis Kazaglis** (22).

Contest problems and solutions have been posted at <http://www.math.uiuc.edu/~hildebr/putnam/undergradproblems.html>.

Littman receives Bateman Fellowship in Number Theory

Friedrich Littmann was awarded the first Bateman Fellowship in Number Theory. Littman came to the UIUC in Fall 1998 from the Technical University in Clausthal-Zellerfeld, Germany, where he earned a master's degree with distinction. During his time here, Littmann has been a straight A student and has served as a teaching assistant in several different undergraduate classes.

Littmann is studying with Professor Harold Diamond, working on a thesis in analytic number theory. His research centers on interpolation theorems using entire functions of given exponential type that majorize (resp. minorize) some particular functions. Examples of such approximations had been found previously by A. Beurling, A. Selberg, and UIUC alum Jeff Vaaler. Littmann has to date established such relations for a large class of interesting functions and has applications, e.g. to Hilbert-type inequalities. Littmann expects to complete his studies this academic year.

The Bateman Fellowship is named for Emeritus Professor Paul Bateman who joined the UIUC Department of Mathematics in 1950. He served as department chair from 1965-1980. During his tenure he supervised twenty doctoral dissertations in number theory,

nineteen at Illinois. He has written joint papers with more than 20 different co-authors.



Front, from left are Felice and Paul Bateman; back row, from left are James McLaughlin, Friedrich Littmann, and Kevin O'Bryant. McLaughlin and O'Bryant, both Ph.D. students, received the Bateman Prize in Number Theory this past spring which is awarded in recognition of outstanding research in number theory.

Dade receives Distinguished Mathematical Research award

Everett Dade has been awarded the 2002-2004 Distinguished Mathematical Research Award in memory of Irving Reiner. The Distinguished Mathematical Research Awards recognize senior members of the faculty for their outstanding achievements and provides them more time to focus on their research activities. The other purpose of these awards is to honor distinguished department faculty members of the past for their contributions to mathematics as a whole and to the UIUC Department of Mathematics in particular.

Professor Dade received his Ph.D. from Princeton in 1960. He spent the years 1960-1967 at the California Institute of Technology, where he was variously a Bateman Research Fellow, an assistant professor, and an associate professor. He joined the UIUC Department of Mathematics as a full professor in 1967, and has remained here ever since, except for a total of four years as a visitor at the University of Strasbourg, France. He had a Sloan Fellowship in 1966-1968, and was an associate in the UIUC Center for Advanced Study in 1996.

Professor Dade is a specialist in the representation theory of finite groups, an area in which he has written

about 50 papers, and supervised ten Ph.D. theses. In the past he has also been interested in general ring theory, where he has written about 10 papers and supervised two Ph.D. theses.

Professor Irving Reiner received his Master's and Ph.D. from Cornell University. After Cornell, he spent a year at the Institute for Advanced Study at Princeton, where he met and worked with Professor L.K. Hua. He joined the UIUC Department of Mathematics faculty in 1948. During his 38 years at Illinois, he wrote 107 research papers, survey papers, books, and other scholarly works, with many collaborators. He directed the thesis work for 17 students. His classic and influential book on representation theory, written with Professor Charles W. Curtis, was published in 1962. During his career, he received many awards for his outstanding work, among these a Guggenheim Fellowship, the Distinguished Alumnus Award from Brooklyn College, and a NATO Senior Fellowship. Professor Reiner died in 1986 at the age of 62.

Staff News

Marci Blocher

joined the Department of Mathematics Graduate Office in May 2002. Some of her duties include maintaining records of applicants and math graduate



students, and secretarial support for the director of graduate studies. She is the first person faculty and students make contact with in the Graduate Office. Marci came from the UIUC history department where she had been employed since 1997.

Alumni After Math

Russell Gordon, professor of mathematics at Whitman College, Walla Walla, WA, received the G. Thomas Edwards Faculty Award for Excellence in Scholarship and Teaching this past May. He joined Whitman's Department of Mathematics in 1987 where he has taught a full range of mathematics classes and has published two books and more than 20 papers.

Gordon received his Ph.D. in 1987 from the University of Illinois at Urbana-Champaign under the direction of Professor Jerry Uhl.

Reiner's *Maximal Orders* re-issued

Oxford University Press is re-issuing the book *Maximal Orders* by the late Professor Irving Reiner of the UIUC Department of Mathematics. The book is in the Monograph series of the London Mathematical Society and was first published in 1975.

The *Bulletin of the American Mathematical Society* said about the original book: "Reiner's book gives by far the most extensive and most readable account available of the classical theory of maximal orders. The book has been written with great care, and is a pleasure to read. Unlike many books at such an advanced level, it contains many interesting exercises, with hints where appropriate. It is essential to the library of every working algebraist."

Of this new reprint, Professor T.Y. Lam wrote: "For years, this book has served as the standard reference for the local and global theory of orders, and has been cited many times in the research literature. Workers in representation theory and the theory of algebras should find the book a valuable addition to their personal library."

2003 wall calendars available

The department has 2003 11x17" wall calendars available for members, alumni, and friends of the department. Last year's theme was past famous mathematicians and was very well received. This year's theme is mathematical places. If you would like a calendar please send your complete mailing address to mathtimes@math.uiuc.edu or to the main department office at the address on page 2 of this newsletter.

Math Times now on-line

The Math Times is now available on-line in pdf format at www.math.uiuc.edu/mathtimes. If you would like to receive e-mail notification when a new issue is available, please send an e-mail to mathtimes@math.uiuc.edu. If you do not have access to the internet and would like to receive a hardcopy of the newsletter please send your complete mailing address to the main department office c/o Lori Dick at the address on page 2 of this newsletter.

In memorium

Colleen Kilker, a graduate student in the Department of Mathematics, died tragically July 23, 2002, in Champaign. Colleen was a 1995 graduate of Stroudsburg High School, PA. She graduated with honors in mathematics from Pennsylvania State University in 1999. She received a Masters Degree from the University of Illinois in 2001 and was a Ph.D. student in the department at the time of her death. Her research interests were in number theory and computational algebraic geometry. In addition to Colleen's interest in mathematics, she was a pianist and enjoyed music.

A memorial service was held by the department on August 27 in Altgeld Hall. Friends and Colleen's advisor, Bruce Reznick, remembered her as "She was somebody who was very easy to like—exuberant, outgoing, determined and smart."

Memorial contributions may be made to the UI Foundation Colleen Kilker Memorial Fund, 1305 W. Green St., Urbana, IL 61801.



Faculty News Notes

- In July, the University of Illinois Board of Trustees approved promotions effective August 2002. Receiving promotion to the rank of Professor is **Alexander Tumanov**. **Jared Bronski** was promoted to the rank of Associate Professor.
- NSF Career Awards were recently awarded to **Scott Ahlgren**, **Robert Ghrist**, and **Igor Mineyev**. The National Science Foundation Career Program recognizes and supports the early career-development activities of those teacher-scholars who are most likely to become the academic leaders of the 21st century. Awardees are selected on the basis of creative, career-development plans that effectively integrate research and education.
- Over a dozen faculty from the department were listed on the Spring 2002 semester Incomplete list of Teachers Ranked as Excellent. They are: **Stephanie Alexander**, **Jared Bronski**, **Harold Diamond**, **C. Ward Henson**, **Gerald Janusz**, **Richard Laugesen**, **Peter Loeb**, **Joseph Miles**, **Robert Muncaster**, **Bruce Reznick**, **Zhong-Jin Ruan**, **Sean Sather-Wagstaff**, **Karen Shuman**, **Douglas B. West**, and **Alexandru Zaharescu**.
- **Peter Braunfeld**, Professor Emeritus, celebrated 50 years with the UIUC Department of Mathematics in September 2002. He was hired by Stuart Cairns as a teaching assistant in September 1952. His advisor was Professor H.R. Brahana. He was appointed as an assistant professor to the UIUC Department of Mathematics faculty in 1963. During the past 50 years he has worked not only for the Department of Mathematics, but also the Control Systems Lab, the Coordinated Science Lab, the University of Illinois Committee on School Mathematics, the College of Education, all at the UIUC, as well as 2.5 years at the National Science Foundation, and summers in Carbondale and at the Education Development Center in Newton, MA.
- **Peter Brinkmann**, a Doob Research Assistant Professor, was invited to spend two months at the University of Melbourne this fall. Following his appointment in Melbourne, he will be visiting the Max Planck Institute of Mathematics in Bonn, Germany from October 2002 through July 2003.
- **Robert Fossum** attended the European Congress on Computer Vision 2002 in Copenhagen, Denmark, in May. Together with Kun Huang of the UIUC Department of Electrical and Computer Engineering, he presented a paper at the Congress. At the conclusion of the Congress he attended the Niels Henrik Abel Bicentennial Conference in Oslo, Norway, after which he gave a lecture on computer vision at the Norwegian University of Science and Technology in Trondheim, Norway.
- **Julian Palmore** gave an invited talk at the ICM 2002 satellite conference on complex analysis sponsored by Shanghai Jiao Tong University in August. He also visited Fudan University to discuss international security at the Center for American Studies. He was guest editor of a special issue of Defense and Security Analysis on Ballistic Missile Defense (September 2002) that is now published. He participated in several events sponsored by the Union of Concerned Scientists during June and July. The first event was held in Washington D.C. and the next two international meetings on security were held at UIUC and in Chicago in July. He was a member of the AMS panel of judges for the International Science and Engineering Fair (ISEF) in Louisville, KY, in May. In April Professor Palmore gave two invited lectures at the University of Alaska, Anchorage, on Chaos, Complexity, and Computability in the spring lecture series of the Complex Systems Group.
- A new course entitled Mathematical Issues in National Security (Math 267) will be offered in Spring 2003. **Julian Palmore** will be the instructor for this new course.
- **Derek Robinson** was a main invited speaker at two international conferences this past summer: The “Bimestre Intensivo” on the theory of groups at the University of Naples, Italy, in May, and “Algebra-Geometry and Interactions” at Hattingen, Germany, in July.
- This past summer, **John Sullivan** lectured on his work at seven conferences in five different countries in Europe and Asia. He spent three weeks at the Newton Institute at Cambridge University, attending a workshop on Foams and Minimal Surfaces, where there was plenty of opportunity for productive collaborations between mathematicians and physicists. During the workshop, he donated a plastic maquette of his sculpture “Minimal Flower 3” to the Newton Institute.

Meet the faculty and postdocs new to the department in fall 2002

Robert Ghrist joined the department this fall as an associate professor. He began his career as a mechanical engineering student but converted to applied mathematics, earning a Ph.D. from Cornell University in 1995. He arrives at Urbana by way of Princeton, NJ, Austin, TX, and Atlanta, GA, where he was an associate professor of mathematics at Georgia Tech. Ghrist's work is in applications of topology and geometry to problems inspired by engineering and computer science. These include fluid dynamics, robotics and assembly, computer graphics, and nonlinear dynamics. When not doing mathematics, Professor Ghrist enjoys playing with his children or building furniture.

Igor Mineyev joins the department as an assistant professor. He received his "Diploma of Higher Education with Honors" in 1992 from Novosibirsk State University, Russia, and his Ph.D. in 1998 from the University of Utah. He then held a grant at the Max-Planck-Institut, Bonn, Germany, for one year, followed by three years as an assistant professor at the University of South Alabama before coming to UIUC. His research area is geometric (a.k.a.

combinatorial) group theory. In the near future, he is planning to develop some theory for Gromov hyperbolic groups and their boundaries. Professor Mineyev is one of the organizers of the Geometric Group Theory on the Gulf Coast (G^3) conference to be held November 8-10, 2002, in Pensacola, Florida. Professor Mineyev used to compose, play, and sing Russian author songs. He is married and has two sons, aged 22 months and 1.5 months old.

Jeremy Tyson joins the department as an assistant professor. He received his Ph.D. from the University of Michigan in 1999 under the direction of Juha Heinonen. Most recently he held an NSF Postdoctoral Fellowship at SUNY-Stony Brook. His research interests are in analysis and conformal geometry in singular metric spaces. He is an avid chess player and an occasional bridge player, and also enjoys outdoor activities such as hiking and canoeing. This summer he and his wife, Rachel, celebrated the birth of their first child, Elizabeth.

Dror Varolin, who joins the department as an assistant professor, received his BAsC in Engineering Science from the

University of Toronto in 1993, and his Ph.D. in mathematics from the University of Wisconsin in 1997. Since then he was a visiting scholar at the Fields Institute in Toronto in the winter-spring of 1997, and an assistant professor at the University of Michigan from 1997-2002. His research interests are centered around several complex variables. To date he has done work related to geometric control theory, dynamical systems and algebraic geometry. Professor Varolin's personal interests include music and sports. He especially likes to play guitar and soccer and listens to music of many genres whenever he can.



Igor Mineyev



Robert Ghrist



Jeremy Tyson



Dror Varolin

J.L. Doob Research Assistant Professors

Alexander Berenstein, a native of Columbia, came to the United States in 1997 and received his Masters and Ph.D. degrees at the University of Notre Dame. His position here at UIUC as a Doob Research Assistant Professor is his first since finishing his Ph.D. Berenstein's field of research is model theory. Most of his thesis work was centered around defining a notion of independence inside structures related to Hilbert spaces. He is interested in expanding these ideas to some Banach spaces and finding applications for these notions. Besides mathematics, he enjoys playing soccer and hiking.

Janne Heittokangas, a native of Finland, received his Ph.D. in 2000 from the University of Joensuu. The title of his thesis was "On complex differential equations in the unit disc." He is interested in complex differential and functional equations, as well as all the other theories related to them. Heittokangas came to USA with his wife and baby daughter. He is confident that working as a Doob Research Assistant Professor in the department will be very fruitful and rewarding.



Alexander Berenstein

Model Theory Postdoctoral Faculty

Tobias Kaiser joins the department as a Model Theory postdoc. He was born in Germany. He studied mathematics and physics at the University of Regensburg, Bavaria, where he received his diploma in 1999. Working as a teaching assistant from 1999-2001, he received his Ph.D. in 2001 with Professor Dr. M. Knebusch. His thesis was on the Dirichlet-problem in o-minimal structures. Prior to his one year appointment as a Model Theory postdoc at the UIUC Department of Mathematics, he was a graduate assistant at the University of Regensburg in 2002. Kaiser's research interest is the connection between potential theory or partial differential equations on the one side and vent algebraic resp o-minimal geometry on the other side. In his free time he likes to play soccer and tennis and he studies history.

Piotr Kowalski, here as a Model Theory postdoc, was born in Wroclaw, Poland, where he received his Masters degree in 1997 and his Ph.D. in 2001 from the University of Wroclaw. He is visiting UIUC from his position as an assistant professor at the University of Wroclaw that he

began in October 2001. He has been a visiting faculty member of the UIUC Department of Mathematics in 1998-99 and spring semester 2002. He has also visited the University of California at Berkeley twice for a month each in 2001 and 2002. Kowalski's research interests include model theory with applications to algebraic geometry and differential algebra.

Funding for the model theory postdoctoral appointments is from a National Science Foundation Focused Research Grant to the UIUC Department of Mathematics.



Tobias Kaiser



Janne Heittokangas



Piotr Kowalski

VIGRE Research Assistant Professors

Patrick Bahls most recently hails from Nashville, TN, where he just finished his Ph.D. at Vanderbilt University. He lived in Denver for 5 years before that, but is originally from Helena, Montana. Bahls' research is mostly in geometric and combinatorial group theory, although he has also delved a bit into the theory of ordered structures. He hopes to make the most of his three years at UIUC, interacting as much as possible with the group theorists here and having the opportunity to teach as much as to learn. Bahls' long-term goal is to acquire a teaching position at a school where he can remain active in research and where good teaching is a priority.

He enjoys studying languages, history, and philosophy, and does a bit of writing on the side. He is a vegetarian and enjoys cooking. He also enjoys running and frequently participates in road races. His wife, Maggie Hoop, is finishing her degree in the history of religion from Vanderbilt University and keeping their snake and hamster company.

Matthew Boylan is from Stevens Point, Wisconsin. He

received his undergraduate degree from the University of Wisconsin at Madison. He spent one year of graduate study at Pennsylvania State University before transferring back to UW-Madison, where he earned his Ph.D. in 2002 with a dissertation on applications of congruences for Fourier coefficients of modular forms. He is interested in applying modular forms to number theory, combinatorics, and arithmetic algebraic geometry. While a student, he played on intramural basketball and softball teams. He is also an avid fan of college sports (in particular football and basketball), and of professional baseball.

Donald Yau is originally from Hong Kong. He received his B.A. from the University of California at Berkeley in 1998 and his Ph.D. from MIT in 2002 under the direction of Haynes Miller. His thesis was entitled "Localization Genus of Classifying Spaces." Yau's main research field is algebraic topology. Currently he is interested in the interactions between cohomology of spaces and their algebraic models, such as algebras over the Steenrod

algebra for mod p cohomology and lambda-rings for K-theory. His hobbies include cooking Chinese and Korean food, or an unbalanced mixture of the two.

Funding for the VIGRE research assistant professor appointments comes from the VIGRE grant received by the department from the National Science Foundation.

Two other faculty members were hired this past year, who will join the department in 2003.

Dirk Hundertmark will join the department as an assistant professor in January 2003. He is spending the fall 2002 semester at the Mittag-Leffler Institute in Djursholm, Sweden, where he received a fellowship to attend the special program "Partial Differential Equations and Spectral Theory."

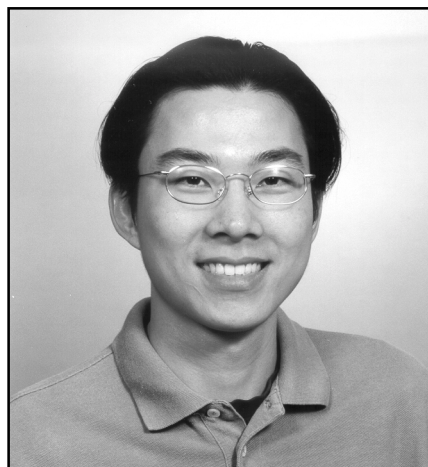
Alina Cojocaru, a J.L. Doob Research Assistant Professor, is on academic leave at the Fields Institute in Toronto, Canada, with support from an NSERC postdoctoral award. After spending summer 2003 at Microsoft, she will join the department beginning in Fall 2003.



Patrick Bahls



Matthew Boylan



Donald Yau

Department continues into year 3 of VIGRE activities

In June 2000, the Department of Mathematics received a five-year Vertical Integration of Research and Education in the Mathematical Sciences (VIGRE) grant from the National Science Foundation (NSF). VIGRE activities have flourished within the department. Now in its third year it seems appropriate to highlight some of the activities on-going in the department. A site visit to review the department's VIGRE activities is scheduled for this fall.

It is not possible to mention every individual or group VIGRE activity here. However, a more complete listing of VIGRE activities from 2000 to present is available on the web at www.math.uiuc.edu/VIGRE.

Research Among Peers (RAPs) are groups intended to be working seminars that consist of faculty, postdoctoral faculty, and graduate students. Some 20 RAPs were conducted during 2001-2002. Research areas covered in these RAPs include knot theory, several complex variables, étale cohomology, L_p spaces and modules, geometry and algebra of computer vision, intersection theory, commutative ring theory, metric spaces of non-positive curvature, and conformal invariance, intersection exponents of Brownian motion.

Across Level Peers (ALPs) are groups intended to consist of faculty members, graduate students and undergraduate students. They differ from RAPs because undergraduate students are involved. An ALP just beginning this semester is on evolutionary game theory.

Graduate Students Seminars (GSSs) are run by and for graduate students. There is usually a faculty member associated with the group. GSSs have been conducted in the areas of algebraic geometry, generating functions, problem solving in algebra, number theory, and random graphs and logical limit laws.

Teaching Training for Under-graduates (TTUs) are supervised activities for undergraduate students interested in teaching. Under the direct supervision of a faculty member, these undergraduate students participate in classroom instruction learning about preparation of lecture materials and examinations. Four TTUs were conducted during the 2001-2002 academic year.

Research Experiences for Undergraduates (REUs) include both individual REUs and summer group REUs. In an individual REU, an undergraduate student works with a faculty member and involves a component of independent research. Summer group REUs consist of a group of undergraduate students working with one or more faculty supervisors. Three summer group REUs were conducted in summer 2001 in the areas of number theory, evolutionary games and geometrical computer graphics. In summer 2002 these three REUs were again conducted along with a fourth one on topology (see the article on page 12 of this newsletter for more about these summer group REUs).

In addition to all these activities, VIGRE funding has provided fellowships for 15 graduate students for the 2002-2003 academic year and recruitment of three postdoctoral faculty each year since 2000. There are currently nine VIGRE research assistant professors on the faculty.

*“Life is good for only two things,
discovering mathematics and
teaching mathematics.”*

—Siméon Poisson (1781-1840)

Weinberger to present Cairns memorial lectures

The Cairns Memorial Lectures series entitled “Towards a Calculus of Symmetry” will be presented by Shmuel Weinberger of the University of Chicago, November 12-14, 2002. Over the course of three lectures, Weinberger will first describe several classification problems in topology and, in particular, some issues of “quantitative topology.” Weinberger will then focus on symmetry and the role of singular spaces in their study. The main result is a very general local-global principle in the classification of stratified spaces that has implications for the study of embeddings and algebraic varieties, as well as group actions. In his third

lecture, Weinberger will discuss how to apply general categorical constructions of algebraic topology in the service of geometry. More information is available at www.math.uiuc.edu/Colloquium/.

The Cairns annual lecture series honors the memory of Stewart S. Cairns (1904-1982), Professor of Mathematics at UIUC from 1948 until his retirement in 1972. The late Professor Cairns' family established a fund to endow an annual series of public lectures on mathematics to be delivered by outstanding mathematicians.

Tondeur completes three-year term as director of DMS at NSF

On July 31, 2002, **Philippe Tondeur** finished his three-year tenure as director of the Division of Mathematical Sciences (DMS) at the National Science Foundation (NSF) in Washington, D.C. Both the *Notices of the American Mathematical Society* and the *SIAM News* published articles about Tondeur's success at NSF¹. During Tondeur's time at DMS, the NSF established the mathematical sciences as a priority area. The division's budget for the current fiscal year (2002) is \$151 million, a 25 percent increase over the previous year. The fiscal year 2003 budget request would add another \$30 million. The number of NSF Career Awards has grown from four the first year to 20 by Tondeur's third year as DMS director.

Tondeur believes that "one of the main, critical needs is to make the mathematical sciences a discipline attractive to young people." Through programs like Vertical Integration of Research and Education in the Mathematical Sciences (VIGRE) there are an increased number of DMS-funded graduate students and postdocs. Undergraduate students are benefiting as well through funding for participants in the VIGRE Research Experiences for Undergraduates.

Complementing the VIGRE program is the Focused Research Group (FRG) program which has been an "immensely successful program" says Tondeur. FRG funds are entirely for research. Research areas covered by the program include dynamics of thin viscous films, analytic properties of discrete groups, epitaxial growth, L-functions, optimal transport, computational conformal mapping and topological methods in data analysis. Many FRGs are interdisciplinary, but this is not a requirement.

Another important accomplishment during Tondeur's tenure at NSF is the creation of several new institutes that will complement the IMA, MSRI and the Institute for Pure and Applied Mathematics at UCLA. The new institutes are the American Institute of Mathematics Research Conference Center in Palo Alto, CA; the Mathematical Biosciences Institute at Ohio State University, Columbus; and the Statistical and Applied Mathematical Sciences Institute at Duke University, North Carolina State University, the University of North Carolina at Chapel Hill, and the National Institute of Statistical Sciences in Research Triangle Park.

"I took the job to change things," Tondeur said of his three years at NSF.

Professor Tondeur joined the department in 1968 and served as department chair from 1996-1999. He retired in 2002 and is now a Professor Emeritus. During his

career, Philippe Tondeur received research distinctions through two appointments as Associate Member in the UIUC Center for Advanced Study, and numerous research grants from NSF and NATO. He served as Editor and Managing Editor of the *Illinois Journal of Mathematics* for eight years. He was a recipient of the William F. Prokasy Award for excellence in undergraduate teaching at UIUC in 1994.

¹ "Interview with Philippe Tondeur," *Notices of the AMS* 49:8 (September 2002) pp. 918-921.

"Proud but Humble, Departing DMS Director Reflects on Three Productive Years," *SIAM News* 35:6 (July/August 2002) pp. 11-12.



Graphic used courtesy of John Sullivan; www.math.uiuc.edu/~jms.

Department of Mathematics Contribution Form

There are many different ways that you can support the Department of Mathematics in its educational and research missions. One way to do this is by contributing to funds at the University of Illinois Foundation that are meant specifically for the Department of Mathematics. Below is a list that shows the variety of individual funds available. Some of these funds are unrestricted in use, while others provide support for the library, funds for maintaining Altgeld Hall, or funding for scholarships or fellowships for undergraduate or graduate students.

If you would like more information about a particular fund, please contact **Joseph Rosenblatt**, Chair, Department of Mathematics (217-333-3352, jrsnbltt@math.uiuc.edu); **Robin Fossum**, the Department of Mathematics representative at the University of Illinois Foundation (217-333-7344, fossum@uiuc.edu); or **Carolyn Pribble**, LAS Development (217-333-7108, cpribble@uiuc.edu). We enthusiastically welcome your interest in the Department of Mathematics.

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SM 5TJ

Twenty-two undergrads participate in summer group REUs

Twenty-two undergraduate students participated in group Research Experiences for Undergraduates (REUs) this past summer.

■ Professor Slawomir Solecki led a group of five students in topology, both point-set topology and fractal geometry. The topic area offers many very interesting topics of study for students. Also, there are a number of open problems that are accessible to undergraduate students in these areas, especially in issues connected with the dimension of fractals.

Participants were: Prudence Heck (Rutgers), Bryce Johnson (Washington Univ.), Christopher Jones (Youngstown), Michael Mulligan (UIUC), and Patrick Watts (Augustana).

■ Professor George Francis led a group of six students in an REU focused on computational mathematics and computer visualization.

Participants were: Amit Chatwani (Princeton), Ben Farmer (UIUC), Michael Henry (Augustana), Abdul Hamide (Xavier), Wendy Hubbard (UIUC), and Yana Malysheva (UIUC).

■ Professor Robert Muncaster led a group REU focused on game theory, Markov chains, and basic evolutionary theory with five participants.

Participants were: Whitney Bush (Bradley), Kristie Engemann (UIUC), Ana Pavasovic (College Intl), Ken Scheiwe (UIUC), and Tim Teravainen (New College Florida).

■ Professor A. J. Hildebrand supervised a group REU in number theory with six students. The program consisted of short courses and lectures, weekly seminars, group meetings, and individually supervised research and concluded with student presentations.

Participants were: Sharon Chuba (Penn State), David Dueber (UIUC), Aleck Johnsen (UIUC), Paul Pollack (Univ. of Georgia), Jeremy Rouse (College Intl), and Erin Wolf (UIUC).

For additional information about the 2002 summer REUs, see the webpage <http://www.math.uiuc.edu/VIGRE/reu>.

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