Math Times

From the Department Chair

This year has included an ever present undercurrent of concern and uncertainty about international political affairs. Also, like a lot of mathematics departments around the country, we have been coping with serious budgetary problems at our university. Despite this, we have gone forward with developing the central missions of our department in teaching and research.

This next year we will officially have 23 postdoctoral faculty members, 14 through the Doob Research Assistant Professor funding and other departmental funding support and nine through the NSF VIGRE Research Assistant Professor funding. This is an all time high for the department. Although we have eight regular faculty members leaving the department through retirement or resignation, we have hired four new regular faculty members in a number of different research specialties. The net effect is an increase in overall faculty numbers if we take the postdoctoral and regular faculty positions together.

A host of other important changes have occurred in the department besides the departures and arrivals in the faculty ranks. We have seen a further increase in overall departmental involvement in the NSF VIGRE program activities. We have created a new Honors Mathematics sequence of five courses which will begin in Fall 2002. We have developed a new type of course with technology, both differential equations and probability with MATLAB recitation components. We have developed plans for improving teaching assistant training and mentoring, while also working to decrease the time-to-degree for all of our graduate students.

We have begun an initiative with other departments on campus to form an Applied Mathematics Program that will coordinate faculty collaboration, teaching, graduate education, and undergraduate programs in applied mathematics of all types. And there's yet more, some of which you'll find in this issue.

I wish you all well through this spring and summer and I hope you will write to us and let us know what you are doing.

In this issue...

Altgeld Hall, University of Illinois at Urbana-Champaign

Events mark Reinhold Baer centennial

This year will see the centenary of the birth of Reinhold Baer, who was a member of the Mathematics Department at UIUC from 1938 to 1955. Baer was an influential figure in the development of algebra and geometry in the first half of the 20th century. His work in group theory and projective geometry was especially significant. Baer had twenty Ph.D. students at Illinois, including such well-known names as R.A. Beaumont, P.F. Conrad, D.G. Higman and P. Dembowski. There is to be an international conference in July at Hattingen, Germany to celebrate the centenary.

When Baer came to Urbana as a refugee from Nazi Germany, he probably regarded Illinois as something of an academic outpost; during his stay he was very much the European professor in exile. Despite this, his time here was a productive one and it led to much important work. Baer also had a very positive influence on the department. For example, he was responsible for Michio Suzuki coming to Illinois. Paul Bateman recalls that Baer's aim was always to return to Germany as a professor, which he achieved in 1955 when he was offered the chair at Frankfurt.
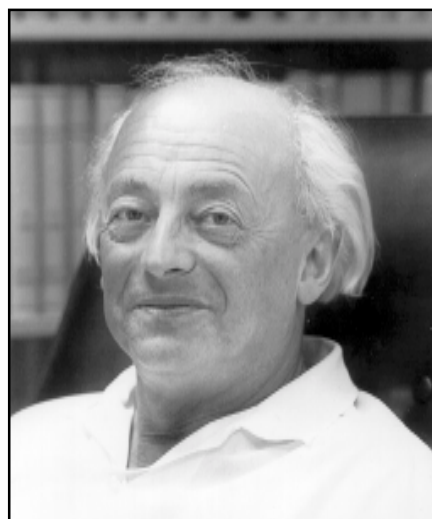
Baer was a founding editor of the *Illinois Journal of Mathematics*, so it is appropriate that the journal has chosen to publish a special monograph to mark the occasion. It will feature articles by over thirty prominent mathematicians who have worked in areas to which Baer contributed. The editors of the monograph are Phillip Griffith and Derek Robinson.

Reinhold Baer

Mathematics honors program to begin in Fall 2002

A committee consisting of Richard Laugesen, Joe Miles, John D'Angelo, Ward Henson and Graham Evans devised a new intensive honors program for students who have already had a year of calculus. The UIUC Department of Mathematics hopes to attract to the honors program roughly 20 students with high interest and ability in mathematics. These students will take courses that provide rigorous treatments of real analysis and linear and abstract algebra. The whole honors program will consist of five courses after which the students will be more than ready to take graduate level mathematics courses.

The committee discussed the program in detail with faculty in the College of Engineering and other units on campus before finalizing the plan. This new program has gained approval by the College of Liberal Arts and Sciences and will be starting up in Fall 2002.

The internet as a supplement in large-lecture calculus instruction

Larry Dornhoff has used computers as an aid to large class mathematics instruction since 1981. He first used the PLATO instructional computer system for precalculus algebra lessons, and switched to first semester calculus when the Mathematics Department began teaching Math 120 in large classes in the mid-1980s. The lessons he wrote then were intended to be relatively complete within themselves, containing both interactive text and exercises and independent of any single textbook. Those lessons cover much of basic algebra but only a few weeks of standard calculus. That computer system, developed at the University of Illinois starting in 1959, was transferred to a private corporation, NovaNet Learning, around 1990 and gradually phased out at the University of Illinois. The lessons, now marketed by NCS Pearson based in Minnesota, are distributed by Internet to many secondary schools and community colleges and see about a million student-hours of use per year.

Dornhoff no longer uses those interactive lessons in his own classes, but continues to find the Internet a valuable tool for large-class instruction. He first used it to distribute homework solutions. Every student deserves the chance to see solutions to all the assigned problems, and far more problems should be assigned than can be solved in class. Instead of handing out stacks of printed solutions at every class or sending students to copy shops every week, he began putting the solutions on the Internet when web browsers became popular in the early 1990's.
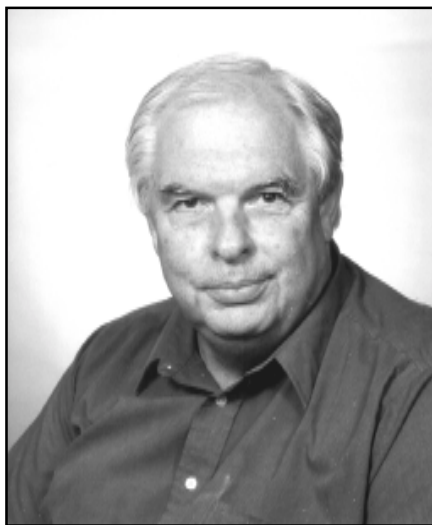
Mathematics has been easy to type for nearly 20 years on personal computers, using the TeX program. Putting that material on the Internet was difficult in the early 90s, since no single file format looked good both on screen and in printed form. Dornhoff then used a version of TeX which produced bitmapped output. He displayed a set of 30 homework solutions as 30 separate .gif graphics files, easily displayed by even the earliest web browsers. For students who wanted to print the entire solution set, he also made the postscript file available for downloading; but many students never learned how to do that and send the file to (even then readily available) postscript printers.

It is now much easier to put mathematics on the Internet because the "PDF" file has become standard. Nearly all web browsers are set to both display and print such files, and the single file looks good in both situations. After teaching calculus nearly every semester for 20 years, he has quite a collection of old exam and quiz questions. Those old exams, many with solutions, are also available for current students.

One can always learn something from the students, even after twenty years. He first refused to put lecture notes on the Internet, thinking that students would not come to class if the notes were available at their dorm rooms. Then he started putting them on the Internet AFTER each class was given. Many students then asked him if they could have the lecture notes BEFORE class, promising that they would still come to class and would learn more thoroughly if they weren't frantically taking notes. He has recently begun making the lectures available a few days in advance, and feels that class attendance has not declined because of this. He uses programs "Mathematica" and "Mayura Draw" to create the graphs needed in lecture notes, in postscript form. Quiz and exam solutions are also posted, usually just a few minutes after the quiz or exam has ended. (If he forgets to do that, he soon gets an email reminder from a student.)

Larry Dornhoff

Surveys of the students indicate that nearly all of them use the web resources frequently, both lecture notes and problem solutions. There is so much material in first semester calculus that he believes it cannot be adequately covered without some such supplementation. Some other calculus lecturers have reported very poor performance by Math 120 students without previous calculus, but results for those particular students have been quite a bit better with the web-based supplements.

You can see Dornhoff's current class website at http://webalgebra.math.uiuc.edu/math120.htm.

Professor Dornhoff received his Ph.D. in 1966 from the University of Chicago. Prior to joining the UIUC Department of Mathematics in 1968, he was an instructor at Yale University. Professor Dornhoff received the Honorable Mention for the Campus Award for Innovation in Undergraduate Instruction Using Educational Technologies in 1999. He currently serves as Chair of the Computer Steering Committee for the department.

Retirements

Philippe Tondeur is retiring after serving three years as Director of the Division of Mathematical Sciences at the National Science Foundation in Washington, D.C., and he is also retiring from his position as Professor of Mathematics at the University of Illinois in Urbana-Champaign (UIUC), to which he was appointed in 1968.

Philippe Tondeur earned his Ph.D degree from the University of Zurich in 1961. He then was a Research Fellow and Lecturer at the University of Paris, Harvard University, the University of California at Berkeley and Wesleyan University, before joining the UIUC faculty, first as Associate Professor in 1968, then as full Professor in 1970, and where he served as Chair of the Department of Mathematics from 1996 until his appointment at NSF in 1999.

He has also been a Visiting Professor at the Universities of Buenos Aires, Auckland (NZ), Heidelberg, Rome, Santiago de Compostela, Leuven (Belgium), as well as at the Eidg.Technische Hochschule (Zurich), the Ecole Polytechnique (Paris), the Max Planck Institute (Bonn) and Keio University in Tokyo.

Tondeur's research interests have been in differential geometry, in particular the geometry of foliations and applications of partial differential equations in geometry. His 94 mathematical publications include nine books, some of which are by now standard reference books on foliations. During the past 40 years, he has presented approximately 200 invited lectures or seminars at various institutions around the world. Eight UIUC students completed their Ph.D. under his direction.

During his career, Philippe Tondeur received research distinctions through two appointments as Associate Member in the Center for Advanced Study of UIUC, 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.

During his years at NSF Philippe Tondeur has become an articulate voice for the role of the Mathematical Sciences in the U.S. Science and Engineering enterprise.

Leon R. McCulloh joined the UIUC Department of Mathematics in 1961 after receiving his Ph.D. in 1959 from the Ohio State University and serving as an instructor in the Air Force Institute of Technology from 1959-1961. He has held visiting positions at Indiana University, the University of Hawaii, and the University of Bordeaux. He spent sabbatical leaves at King's College London, the University of Regensburg, and Cambridge University, being granted the status of Bye-Fellow at Robinson College Cambridge in 1986 and 1993. His research interests are in algebraic number theory, particularly in the relations between algebraic number theory and the theory of integral representations of finite groups, and the Galois module structure of rings of integers in algebraic number fields. His most significant work was on the "Galois module structure of abelian extensions" published in *Crelle's Journal* in 1987. He hopes to complete the writing of the sequel on the "Galois module structure of nonabelian extensions" after retiring from teaching this spring.

He has served on numerous committees within the Department of Mathematics as well as one term on the University of Illinois Senate. Nine students have completed their Ph.D.s under his direction.

After arriving at the U of I in the early 1960's he became active in the campus civil rights movement, serving as faculty advisor to the student NAACP from 1962-1964. Later, he played active roles in helping to reform the Champaign County Democratic Party and to establish the Union of Professional Employees at the U of I. More recently he has been less active in social causes which he hopes to remedy upon retiring.

Philippe Tondeur
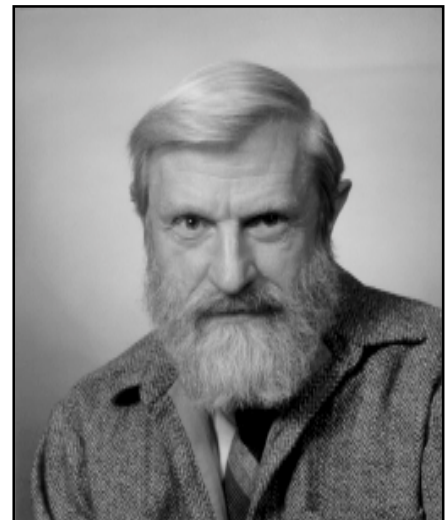
Leon McCulloh

Harold Diamond joined the UIUC Department of Mathematics in 1967 and became a full professor in 1972. He did his undergraduate work at Cornell University, where he studied with W.H.J. Fuchs and Mark Kac. He received his doctorate from Stanford University in 1965 with a thesis in analytic number theory, written under the direction of Paul J. Cohen. He held postdoctoral positions at the Institute for Advanced Study at Princeton and the ETH in Zurich, Switzerland, before coming to UIUC. He has spent sabbatical years at the University of Nottingham, England, and the University of Texas at Austin.

Diamond's research interests center on analytic number theory, the use of techniques from analysis to solve problems in number theory, and related topics in analysis. He has done a substantial amount of joint work with UIUC Professors Paul Bateman and Heini Halberstam, particularly on problems involving the distribution of prime numbers and sieves. This year he became editor for Number Theory of the *Transactions of the American Mathematics Society*. Ten students have completed their Ph.D. under his direction.

Professor Diamond enjoys mathematical problems and working
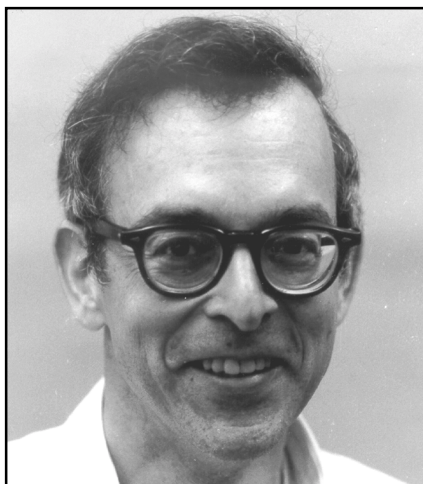
Harold Diamond

with students. For several years, he was one of the editors of the Problems Section of the American Mathematical Monthly. Along with Professor A.J. Hildebrand, Diamond has been offering weekly training sessions each fall term to help prepare students for the W.L. Putnam Mathematics Competition. This exam, open to all undergraduates in the United States and Canada, is held annually and attracts about 2,500 participants. Professors Diamond and Hildebrand have also been the organizers of the UIUC Undergraduate Mathematics Contest, formerly known as the "Orange and Blue Contests." This campus-wide math problem contest is the local version of the Putnam Competitions.

I. David Berg

Professor **I. David Berg** joined the UIUC Department of Mathematics in 1964. After receiving his Ph.D. in 1962 from Lehigh University where he worked under A. Wilansky, he became a lecturer at Yale University from 1962 to 1964. He also served as a Visiting Associate Professor at Queen's University, Kingston, Ontario, in 1971 and as a Visiting Professor at Monach University, Melbourne, in 1978. His earlier research interests centered

Robert P. Kaufman

around the problem of approximation of operators in Hilbert spaces. His research in this area culminated in his work with K. Davidson of Waterloo obtaining a norm-continuous analogue of the Brown-Douglas-Fillmore theorem. His current work is in geometry where he is collaborating with I. Nikolaev. His earlier insights in geometry have been largely absorbed in the work of other mathematicians. Three students have completed their Ph.D.s under his direction, all on some variant of harmonic analysis.

Professor **Robert P. Kaufman** received his Ph.D. in 1965 from Yale University. After serving as a teaching assistant at Yale spring semester of 1965, he joined the Department of Mathematics in the fall of 1965. He was named an Alfred P. Sloan Research Fellow in 1972-73, held an appointment as a Beckman Associate in the Center for Advanced Study in 1982-83, and was named a UIUC University Scholar in 1987-88. His research interests are in analysis, including classical analysis, complex function theory, Hausdorff measure, and analytic sets. He has written over 100 papers. Six students have completed their Ph.D.s under his direction.

■ Retirements, Continued

Emily Peck retired from the UIUC on March 1, 2002. From 1973–1979 she split her time one-third as an Assistant Professor of Mathematics and two-thirds as Assistant Dean in the College of Liberal Arts & Sciences Student Academic Affairs Office where she was responsible for student advising and for various college policy committees. From 1979–1986 she continued teaching each semester in the Department of Mathematics, but was full-time in LAS where she continued with additional policy committees such as curriculum committees, and policies for implementation of LAS general education requirements.

In 1986, she transferred to the Office of the Dean in LAS doing full-time policy, budgeting, and costing work, and was promoted to Associate Dean of LAS in 1988. She has continued teaching at least once each year as well as serving on a number of campus committees and task forces and college committees. She also worked on a number of curriculum projects in the Department of Mathematics.

Emily Peck

She is responsible for the funding of general education instruction and instruction not in departmental budgets and for technology in LAS Administration. She established and developed an information systems unit in the College and instituted a departmental management database system to assist departments and the college in understanding how instruction is carried out in departments. Major policy changes that Dean Peck worked significantly on include:

• revision of secondary teacher education programs on campus;

• campus general education policy (adopted in 1989);

• began first cost studies of how much it costs LAS to implement curriculum, general education changes;

• review of college financial state, departmental goals, and plan to increase out-of-state undergraduate LAS enrollment;

• what our campus policies should be for controlling size of the freshman class from the admission process through registration in the fall semester;

• chaired task force to develop campus-adopted mathematical models for estimating carefully the number of spaces in various freshman classes and groups of classes;

• campus planning for what our policies should be for graduate students holding assistantships and how we should handle various issues for the graduate assistants;

• campus and college planning for policies for temporary instructors, lecturers, and for long-term lecturers.

Upon her retirement in March, the college established the Emily Mann Peck Scholarships in Mathematics for freshmen in mathematics.

From the Graduate Office...

Phillip Griffith, Director of Graduate Studies, reports that 24 students will receive their Ph.D. for the 2001-02 academic year. Several of those graduating have been awarded postdoctoral positions.

Kevin and Natella O'Bryant have both been awarded post-doctoral fellowships. Kevin received an NSF Postdoctoral Fellowship at the University of California, San Diego, and Natella's has taken a postdoctoral position at the University of California at Irvine. Congratulations also go to the O'Bryants on the birth of their daughter, Sofia Valentine, on February 16, 2002.

James McLaughlin has received a 3-year Harold L. Doward Visiting Assistant Professor Postdoctoral position at Trinity College in Hartford, Connecticut. **Magdalena Musat** has been awarded a postdoctoral position at University of California at San Diego, and **Christopher Willet** has accepted a postdoctoral position at Indiana University. **James Tyne** has accepted a 3-year VIGRE Postdoctoral position at Ohio State University.

As was the case last year, the Department has been awarded three Illinois Distinguished Fellowships that have been awarded to **Alexander Sotirov** from Columbia University, **Amy Marinello** from Swarthmore University, and **Trevor Fast** from Kansas State University. In addition, **Kimberly Patti**, from St. Louis University, has received an offer for a Diffenbaugh Fellowship. The Diffenbaugh Fellowship is restricted to current or past residents of the State of Missouri.

New faculty and postdocs to join department in Fall 2003

The Department of Mathematics is pleased to announce the new faculty and postdocs that will be joining the department this coming fall. Further hiring is still in progress.

Assistant Professors

Igor Mineyev, currently an Assistant Professor at the University of South Alabama. Research interests: geometric group theory, hyperbolic groups, bounded cohomology, and Baum-Connes conjecture.

Dror Varolin, currently an Assistant Professor at the University of Michigan at Ann Arbor. Research interests: stable manifolds of holomorphic diffeomorphisms, and effective methods in algebraic geometry.

Jeremy Tyson, currently an NSF Postdoctoral Research Fellow at SUNY at Stony Brook. Research interests: geometric function theory, quasiconformal maps, and analysis on metric spaces.

Dirk Hundertmark, currently an Olga Taussky-John Todd instructor at the California Institute of Technology. Research interests: analytic, probabilistic problems in math physics; eigenvalue moments for Schrodinger operators; spectral theory of random Schrodinger operators and statistical mechanics.

Model Theory Postdocs

The Model Theory postdoctoral appointments are funded by a National Science Foundation Focused Research Grant to the department. Each appointment can be between one and three years. This year's appointees are:

Piotr Kowalski, an Assistant Professor at the University of Wroclaw, Poland, whose research interests are in groups definable in differential and difference fields, and model theory of compact complex spaces. Kowalski is currently a visiting assistant professor with the UIUC Department of Mathematics.

Tobias Kaiser, currently a graduate assistant at the Universitat Regensburg, is working with M. Knebusch in the area of 0-minimal geometry and PDEs.

Doob Postdocs

The J.L. Doob Research Assistant Professor appointments are named for Emeritus Professor Joseph L. Doob, a long-time member of the department who received the Presidential Medal of Science. Two to three new Doob postdoctoral appointments have been made each year since 1997. The 2002-2005 appointees are:

Alexander Berenstein, currently a graduate student the the University of Notre Dame working with Steven Buechler in geometric model theory of homogeneous models, simple stable homogeneous expantions of Hilbert spaces, and simple stable homogeneous C* algebras.

Alina Cojocaru, currently a graduate student at Queen's University, Canada, working with M. Ram Murty in the areas of analytic number theory, algebraic number theory, elliptic curvse, modular forms, Abelian varieties, Galois representations, and cryptography.

Janne Heittokangas, currently a senior assistant at the University of Joensuu, Finland, where he received his Ph.D. in 2000. His research interests are in differential and functional equations in a complex domain.

VIGRE Postdocs

Funding for the VIGRE Research Assistant Professor appointments began in Fall 2000 with a Vertical Integration of Research and Education (VIGRE) grant received from the National Science Foundation. Each appointment is for three years. The 2002-2005 appointees are:

Patrick Bahls, currently a graduate student at Vanderbilt University, Nashville. His research interests are in combinatorial and geometric group theory, algebraic topology, and lattices and ordered structures.

Matthew Boylan, currently a graduate student at the University of Wisconsin at Madison, working with Ken Ono in the area of elliptic curves, modular forms, partitions, and combinatorics

Donald Yau, currently a graduate student at MIT, is working with Haynes R. Miller in the area of localization genus and its relations with lambda-rings.

Department Awards

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

Undergraduate Awards

In 1996 the Department of Mathematics established prizes in the four undergraduate majors. A student may be selected once in his/her undergraduate career for such a prize.

Undergraduate Major Award in Actuarial Sciences

Jillian Strom has already passed two of the actuarial examinations which is as many as any undergraduate. She has taken an impressive collection of CS courses far beyond the requirements of the major.

Undergraduate Major Award in Mathematics

This year, the Major Award in Mathematics was split between two students, **Michael Baym** and **David Dueber.** Baym has taken an astounding nine 400 level course while an undergraduate. He has held several REUs from the department's VIGRE grant doing work in number theory. He went to the Park City mathematics conference last summer. Dueber is a Math/Chem E double degree major. Last year he was a co-winner of the UIUC Undergrad Math Contest and ranked 120th nationwide in the 2000 Putnam exam. One instructor said that he was the best student in his 400 level class even though he was an undergraduate. He has held an REU from the department's VIGRE grant.

Undergraduate Major Award in Math and Computer Science

Matthew R. Ahrens of Elmhurst is this year's winner of the Math/CS prize. Last year he won the John R. Pasta award for the best Junior in computer science based on academic merit.

Undergraduate Major Award in Teaching of Mathematics

Blaire Rose was one of the first TTUs from the department VIGRE grant adding life to a section of 119. She has been on the Dean's list every semester she has been here. One of her instructors says that her intelligence and enthusiasm for teaching makes her one of the best students in the teaching option in years.

H.R. Brahana Prize

David Smyth has a perfect 4.0 average over all courses while taking several 400 level mathematics courses. One of his instructors commented on his remarkably mature solutions of difficult problems. He is currently spending the semester doing mathematics in Budapest.

The Brahana Prize is awarded to a graduating senior in any discipline with a distinguished undergraduate career in mathematics. The fund was established to acknowledge the contributions of Professor H. Ray Brahana to the department and the university. Professor Brahana was a member of the mathematics faculty from 1920 to 1963. His work involved finite groups and related geometric structures.

Greenwood and Trjitzinsky Prize in Undergraduate Mathematics

Michael Baym is this year's recipient of the Greenwood and Trjitzinsky Prize which recognizes the best paper in mathematics written by an undergraduate. He received the prize for his work on the lonely runner conjecture, a deceptively simple conjecture in number theory/graph theory. He was also awarded the Undergraduate Major Award in Mathematics.

Salma Wanna Memorial Award

Rich Astudillo has held a TTU and several REUs from the department's VIGRE grant including work in number theory that will lead to publication. As a Junior he is already taking 400 level courses.

The Salma Wanna Award was established in 1985 in memory of Salma Wanna who received her Ph.D. in 1976. It is given for exceptional performance in mathematics to the most outstanding continuing student. The prize committee consults with mathematics instructors and bases its decisions on instructor comments as well as outstanding success in course work.

Graduate Awards

Bateman Prize in Number Theory

This year, the Bateman Prize was shared by **Kevin O'Bryant** and **Jimmy McLaughlin**. O'Bryant was an undergraduate at the Rose-Hulman Institute of Technology and a Fulbright scholar in Hungary before becoming a graduate student at UIUC. While here he has organized seminars during the summer, himself giving 20 seminar talks and 8 conference talks. He has published in number theory and graph theory, and has Erdos number 2. His thesis "Sidon Sets and Beatty Sequences" explores problems in additive number theory and the properties of almost-linear sequences of integers. His thesis advisor is Kenneth B. Stolarsky. Next year, O'Bryant will be working with Ron Graham at the University of California, San Diego, as an NSF Postdoctoral Research Fellow.

McLaughlin is a student of Doug Bowman. He entered graduate school in 1996, after having spent the first fifteen years of his professional life traveling the world while holding down a variety of jobs, from construction worker to high school math teacher. His primary research area is continued fractions, where he has settled a long-standing problem on the convergence of the famous Rogers-Ramanujan continued fraction. Jimmy is expected to receive his PhD degree later this year, and has accepted a postdoc position at Trinity College in Hartford, beginning Fall 2002.

The Bateman Prize is awarded in recognition of outstanding research in number theory.

Irving Reiner Memorial Award

Bogdan Petrenko is this year's winner of the Reiner Award. Before coming to the UIUC, Petrenko published papers on group theory. He just wrote two papers solving basic (but new) problems involving finite fields. He also works on applications of algebra to engineering, especially cryptography. Petrenko's advisor is Nigel Boston.

The Reiner Prize is awarded to one or more graduate students in recognition of outstanding scholastic achievement in the field of algebra.

Hohn-Nash Award

Michael Bush, this year's winner of the Hohn-Nash Award, has just submitted a paper to the *Journal of Number Theory* answering an old question of Stark by extensive use of clever computational ideas. He was the only graduate student to speak at the recent Midwest Algebraic Number Theory Day at Michigan. His advisor is Nigel Boston.

The Hohn-Nash Award was established by Gene Golub and named in honor of Professors F. Hohn (Mathematics) and J.P. Nash (Computer Science). It is given in recognition of outstanding scholarship and promise in applied mathematics.

Department TA Instructional Award

This year's recipients of the TA Instructional Award are **Mark Anderson, Parthena Avramidou**, and **Dominika Polkowska**. Anderson is an eighth year graduate student studying discrete dynamical systems with Professor Robert Muncaster. Avramidou is a fourth year graduate student studying ergodic theory under the direction of Professor Joseph Rosenblatt, and Polkowska is a third year graduate student studying model theory with Professor Anand Pillay.

A committee of faculty, graduate students, and undergraduate students determines the winners. Awards are based on classroom observation, comments from students, and a written report by the nominees describing their teaching goals.

Staff Award

Outstanding Department Non-Academic Staff Award

Tess Rannebarger, Business Office Secretary, is this year's recipient of the Staff Award. Tess has worked for the Department of Mathematics since 1995. She started as a Secretary II, and at the beginning divided her time between the main office and the Business Office. After several months she began working entirely for the Business Office, and has been there since. She was promoted to a Secretary III in 1996, then to a Secretary IV in 1999. She is very dependable and able to handle a myriad of responsibilities. She has developed a working relationship with many employees across campus, including employees in Operation & Maintenance, Student Employment and the Accounting Division.

This award recognizes outstanding staff contributions to the department and the university through leadership and work excellence. This is the third year that this award has been given.

Faculty News Notes

The Department of Mathematics will host the 22nd annual Illinois Council of Teachers of Mathematics (ICTM) State Finals to be held on the UIUC campus April 27, 2002. Over 200 high school students will participate in this contest. Site chair, **Karen Mortensen**, assisted by **Debra Woods**, are the coordinators of this annual event. More information about the ICTM contest can be found on the web at www.math.uiuc.edu/ictm/.

Bruce Berndt has been named an Associate of the Center for Advanced Study (CAS), and **Matthew Ando** has been named a Fellow of CAS for the 2002-2003 academic year. An appointment in CAS grants one semester of release time for creative work on self-initiated programs of scholarly research or professional activity.

Sean Sather-Wagstaff, VIGRE Research Assistant Professor and NSF Mathematical Sciences Research Postdoctoral Fellow, will participate in the MSRI program "Commutative Algebra" as a General Member for the spring semester of 2003.

In February, **Leon McCulloh** and **Marcin Mazur** attended a meeting, Orders in Arithmetic and Geometry, in Oberwolfach. Mazur gave a lecture about his recent joint work with Steve Ullom "Galois module structure of units in real biquadratic number fields." McCulloh gave a lecture on "From Galois module classes to Steinitz classes." McCulloh was also one of several friends of Ali Frohlich who gave short talks at the "Celebration of a Life" program for Frolich at Robinson College in Cambridge held in February.

Julian Palmore serves on the executive committee of ACDIS, the UIUC program in arms control, disarmament and international security. In February he was a member of the NSF panel in mathematical sciences for the graduate research fellowship program, meeting in Arlington VA. This high priority program awards almost 1000 fellowships yearly across fields of science and engineering research funded by NSF. Palmore has been invited to lecture at the University of Alaska at Anchorage in April on chaos, complexity, and computability as part of the 2002 Complex Systems Lecture Series there. He also served on a workshop panel sponsored by the European Union Center on April 3 on "The Coalition Against Terrorism: U.S.-E.U. Cooperation." This is part

West, Denne receive teaching awards

Professor Douglas B. West has been awarded the Campus Award for Excellence in Undergraduate Teaching. West is considered by the Department of Mathematics as one of their most demanding and most popular instructors. In recent years he has received essentially perfect ICES scores in challenging courses without sacrificing content or inflating grades.

West has also made outstanding contributions to instruction at the department, campus, and national levels. He has transformed Math 312-Graph Theory into one of the department's most popular and important advanced undergraduate courses. He has also written text books which are used throughout the country.

Elizabeth Denne has been awarded the College of Liberal Arts and Sciences Award for Excellence in Undergraduate Teaching for Graduate Teaching Assistants. Denne is a 4th year graduate student working under the direction of John Sullivan on a problem in geometric knot theory. Her work will prove the existence, for any knotted curve, of straight lines cutting it four times. This will have immediate applications, giving an alternate proof of a recent result about the second hull of a knotted curve. Elizabeth has been a very active participant in the mathematical life of the department, regularly attending and speaking in two RAP seminars, on Knot Theory and NonPositive Curvature, organizing the graduate seminar, and mentoring new graduate students. She received her BSc with honors from the University of Sydney, Australia, in 1998.

of the UI's European Unior Day activities. This past fall, he was interviewed, wrote and spoke on the events of September 11 and their aftermath and consequences.

Steve Bradlow is on leave this year at the University of California San Diego. While on leave he has been doing his part to spread the word about 'gauge theory moduli spaces and holomorphic vector bundles'. He has given talks at UC-San Diego, UC-Irvine, UC-Riverside, San Diego State University, and Stanford University.

Alumni After Math

Matthias Aschenbrenner has been awarded the Sacks Prize by the Association of Symbolic Logic for the best thesis world wide in logic for 2001. Aschenbrenner's thesis "Ideal Membership in Polynomial Rings Over the Integers," written under the supervison of UIUC Mathematics Professor Lou van den Dries, solves the long-standing problem concerning the complexity of the ideal membership problem over the integers. Aschenbrenner received his Ph.D. from the UIUC in 2001 and is currently a Charles B. Morrey Postdoc at the University of California at Berkeley.

Heng Huat Chan, an Associate Professor at the National University of Singapore, is currently on leave at the University of Sussex on a Commonwealth Fellowship. He received a university-wide award for teaching in 1998 from the National University of Singapore and was chosen as Young Scientist of the Year in 1999 for the country of the Republic of Singapore. The Young Scientist Award is presented to researchers aged 34 years or below who are actively engaged in research and development activities in Singapore and have shown great potential to be world-class researchers in their fields of expertise. He received his Ph.D. in 1995 from the UIUC Department of Mathematics under the direction of Bruce Berndt.
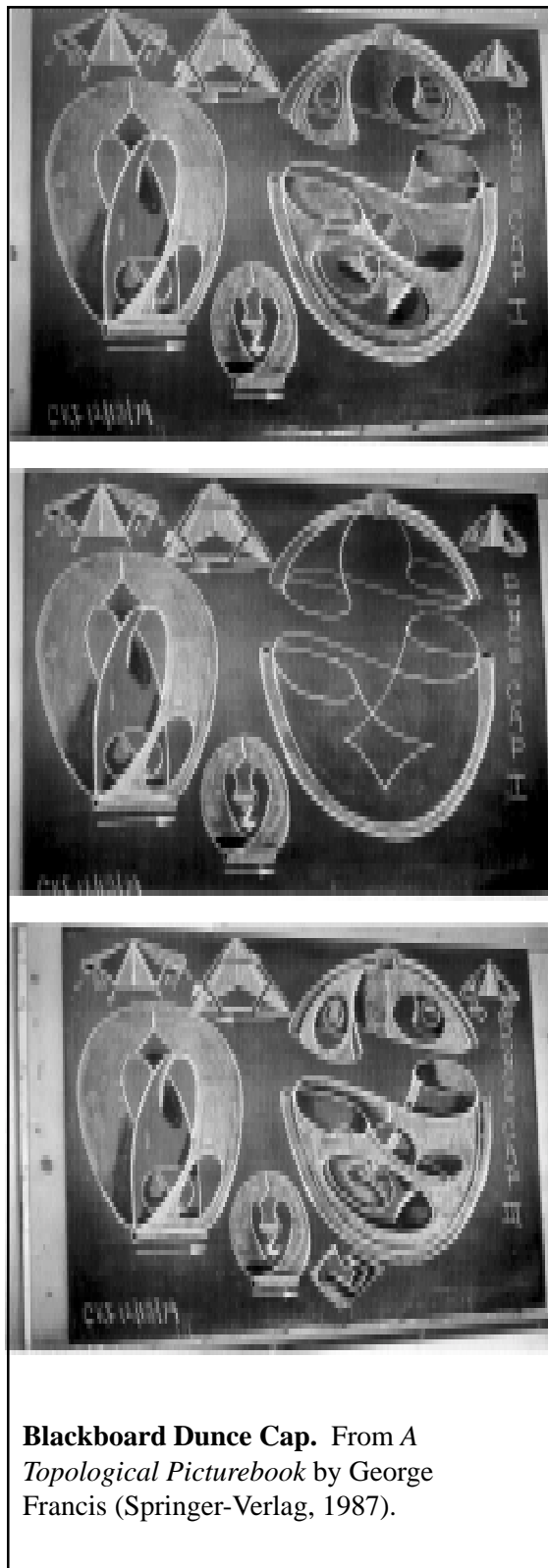
Robert E. Meggison, a professor of mathematics at the University of Michigan at Ann Arbor, will serve as Deputy Director of the Mathematical Sciences Research Institute, Berkeley, CA from July 1, 2002 through July 31, 2004. Professor Meggison received his Ph.D. from the UIUC Department of Mathematics in 1984 under the direction of Mahlon Day.

Jeff Meyer, currently an Assistant Professor at Syracuse University, has received the Meredith Recognition Award for Excellence in Teaching at Syracuse University. Meyer received his Ph.D. from the UIUC Department of Mathematics in 1997 under the direction of Bruce Berndt.

Dr. Lawrence E. Somer, a professor of mathematics at The Catholic University of America in Washington, D.C., has published a book entitled "17 Lectures on Fermat Numbers" (Springer). Dr. Somer received his Ph.D. from the UIUC Department of Mathematics in 1985 under the direction of E.T. Parker. Coauthors of the book are Michal Krizek, Czech Republic, and Florian Luca, UNAM, Morelia, Mexico.

If you have news to contribute to Alumni After Math, please send it to Tori Corkery, Editor, Math Times, 263 Altgeld Hall, 1409 W. Green St., Urbana, IL 61801, or e-mail: mathtimes@math.uiuc.edu.

Blackboard Dunce Cap. From *A Topological Picturebook* by George Francis (Springer-Verlag, 1987).

UIUC Team places 14th in Putnam Competition

The 62nd annual William Lowell Putnam Mathematical Competition was held December 1, 2001. Nearly 3000 students from the U.S. and Canada participated in this contest. The team contest was won by Harvard, followed by MIT and Duke. The UIUC team, coached by Professors Harold Diamond and A.J. Hildebrand, placed an excellent 14th out of the 453 participating colleges, a significant improvement over last year's 35th rank and the highest ranking of the past ten years. The top ranking individual UIUC participants were Kaushik Roy, who placed 109th, and David Dueber and Ken Scheiwe, who tied for 164th place.

Staff News

Kay Daly has been promoted to the rank of Staff Secretary in the Department of Mathematics Undergraduate Office where she assists the Director of Undergraduate Studies and the Freshman Academic Advisor in managing and overseeing the work flow of the office. Other duties include managing and maintaining the computerized department grading program currently used by approximately 50 instructors. She is also the coordinator of the Mathematics Commemencement Ceremony. Kay first joined the department in July 1990.

Pat Crawford, who has worked for the UIUC Department of Mathematics as extra help every year since 1992, was appointed to a permanent part-time position as the undergraduate advising secretary in the Office of Undergraduate Studies in May 2001. Some of her duties include maintaining student enrollment functions on UIDirect to assist students with scheduling problems and resolutions, assisting with commencement, helping the freshman academic advisor with Precalculus Summer Camp, and maintaining the records for the Research Experiences for Undergraduates which is held in the summer.

Julie Townsend joined the department as an academic hourly in Fall 2001 and was appointed to an academic professional position of Grants and Events Specialist in February 2002. Her job duties include coordinating grant submissions, providing support for department events and maintaining department databases.

Actuarial science professorship

In December 2001 the University received a $250,000 grant from the State Farm Companies Foundation of Bloomington, Illinois. Together with a similar grant expected in December 2002, this will be used to establish the State Farm Companies Foundation Professorship in Actuarial Science.

Named professorships are a very valuable tool in attracting and retaining highly qualified people for academic positions, by making up some of the difference between typical University salaries and those in the private sector. Monies are received and invested by the University of Illinois Foundation, and the income (but not the principal) is used to support the named professorship, through added salary and other expenses. It is expected that the person named to the State Farm Companies Foundation Professorship will have expertise and academic abilities within the field of Actuarial Science, in addition to other qualifications for a professorial appointment in the Mathematics Department.

A formal announcement of the professorship will take place at a reception on April 25, 2002.

Millennial conference proceedings goes to the printer

Work has been completed on *Number Theory for the Millennium*, the proceedings of the conference held at the University of Illinois Mathematics Department in May, 2000. The Millennial Conference on Number Theory was a six-day international meeting that, with 276 attendees from 30 countries and 160 talks, was the largest general number theory conference ever held. The Conference was supported in part by grants from the Number Theory Foundation, the National Science Foundation, the National Security Agency, the Institute of Mathematics and Applications, the UIUC College of Liberal Arts and Sciences, and the UIUC Department of Mathematics.

The proceedings of the Conference, edited by the organizers, Professors Michael Bennett, Bruce Berndt, Nigel Boston, Harold Diamond, and A. J. Hildebrand of the UIUC Math Department, and Walter Philipp of the UIUC Statistics Department, also shattered records. Consisting of 72 articles in 1400 pages in three volumes, it is a work of unprecedented proportions. The technical preparation of the volumes was carried out by A.J. Hildebrand. The proceedings is being published by A K Peters, who in addition is making a separate paperback book of the 14 articles that are of an expository nature.

Spring MSS lecture series

The Mathematics in Science and Society (MSS) lectures series continues to bring a variety of excellent speakers to campus. Richard Laugesen has served as the organizer of the MSS lecture series for the 2001-2002 academic year.

Lectures presented this spring included a talk entitled "The InterPlanetary Superhighway and the Development of Space," by Dr. Martin W. Lo, Navigation and Mission Design Section, Jet Propulsion Laboratory, California Institute of Technology. Dr. Muriel Scheinman, Adjunct Assistant Professor, Art History, UIUC, presented a lecture on "Altgeld Hall: Its History, Architecture, and Art." In March, Professor Grigory I. Barenblatt, University of California at Berkeley, presented a talk on the "Instances of Applied Mathematics."

Wrapping up the semester will be a talk on April 30th by Philippe Tondeur, Director of NSF's Division of Mathematical Sciences and a professor in the UIUC Department of Mathematics. He will present a talk entitled "The Mathematical Sciences - a perspective on the federal support role after serving three years as Director of NSF's Division of Mathematical Sciences." Professor Tondeur is retiring from the department this spring and will be giving the Remarks to the Graduates at the Department of Mathematics Commencement Ceremony on May 12, 2002.

Visit the MSS website for more details about these and upcoming lectures at www.math.uiuc.edu/MSS/.
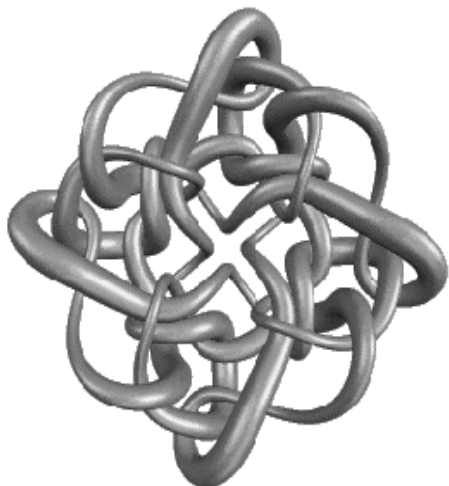
What's new in NetMath?

Are you aware that our very own department offers distance education courses (NetMath) all over the world? Did you know that we have offered them for nearly 10 years now and that we are one of the most successful distance education programs in the world?

A by-product of the award winning Calculus&Mathematica program is its natural capacity for use with technology and in distance learning. The lessons are written to allow students a chance to learn through hands-on experimentation. When students run into a roadblock or want to discuss what they are learning with someone, on-line mentors are there to help them with math questions and technology issues.

NetMath boasts a student pass rate (students who don't drop and receive grades of C or better) of somewhere between 69% and 85% depending on the class. This is significantly higher than the less than 50% retention rate of many distance-learning programs. Most students who drop do so for technology reasons.

The flexibility of the program allows students to take their class around their work schedules. For example, one student did the coursework while traveling between the U.S. and South Africa while working for Exxon, and still in many other cases, campus students take the courses during the summer while working at internships. Some of the students are disabled. One student is a college student who is homebound but is working on a degree from home. He is also now an employee of the program.

The students we have worked with live all over the world including England, Pakistan, Italy, Japan, China, Korea, Columbia, India, Taiwan, Puerto Rico, Canada, Bermuda, Philippines, and Singapore. The individual mentors who work with the students report that they build a personal relationship with the students even though they usually never meet. Students send Valentine e-cards and birthday cards to their mentors on occasion. The mentor/student relationship is such that the mentors are very proud of their students accomplishments. Student comments upon finishing a course are favorable toward their mentors as well as the format and courseware. As one student put it, This was my first Internet/Mathematica based class. I found the format and content excellent.

Currently underway is a new course in pre-calculus. The test site for the course is the Technology Center of DuPage, a vocational training center for high school students in DuPage County. Math 116 is being taught for college credit to the students there using the newly developed lessons. Math 116 is targeted to become a regular NetMath offering beginning in Fall 2002.

Anyone who is interested in finding out more about NetMath is invited to stop by the computer lab in 239 Altgeld Hall or contact Debra Woods. There are on-line mentors working in the lab all day long! You can also visit the NetMath website at http://netmath.math.uiuc.edu.

New education software, Iode, under development

By Peter Brinkmann, Robert Jerrard, and Richard Laugesen

Iode is an educational software package at the heart of an on-going effort to modernize the syllabus of Math 285, the first course on differential equations and Fourier series at UIUC. The department already offers fully computer-based sections of the course, using Mathematica, but the traditional sections of the course have not until now used computers. In the modernized syllabus, we want to retain traditional blackboard exposition wherever reasonable, with the computer being used only for topics that are awkward or impossible to present by hand. Examples of such topics include direction fields, numerical methods for solving differential equations, and Fourier series of complicated functions.

Our basic principles are:
• We want the implementation to be open and accessible to students, so that they can read, understand, and modify the code. In particular, we believe students in Math 285 ought to gain a rough understanding of how to implement numerical methods.

• We want the software and all supporting materials to be in the public domain, available at no cost to anyone who is interested. The code must run on a wide range of platforms.

Although many educational software packages exist already, we know of none that comes close to satisfying the above conditions, and so we have implemented our own package, Iode (for "Illinois Ordinary Differential Equations").

Iode runs equally well under either Matlab or Octave (a numerical software package that is mostly compatible with Matlab). Both Iode and Octave are free software, governed by the GNU General Public License. Iode is highly modular, with well-documented interfaces to encourage students to study and modify the code. It comes with a self-explanatory, menu-driven user interface.

By now, we have created a fairly extensive suite of supporting materials, including a website (www.math.uiuc.edu/iode/), manuals and tutorials, technical documentation, labs and homework projects, as well as an automatic evaluation tool that allows students to send us anonymous feedback.

We are currently using Iode in three sections of Math 285 with encouraging results. Most students appreciate the new material, and it appears that working with Iode has improved their understanding of a number of topics, numerical methods in particular.

Everyone is welcome to use or contribute to Iode. If you have any questions, or ideas for additional projects or modules to add to Iode, or anything else, please let us know at iode@math.uiuc.edu!
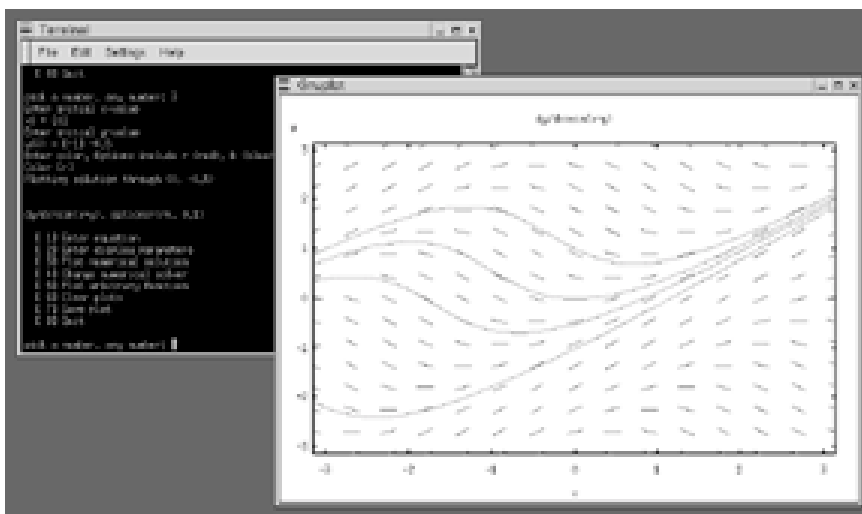
Department of Mathematics Contribution Form

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.

I want to support the Department of Mathematics with a gift of $_____ to the fund(s) checked:

❑ Actuarial Science Fund (#3030225)

❑ Allstate Foundation Actuary (#3030342)

❑ Allstate Minority Actuary§ (#3040110)

❑ Altgeld Hall Restoration   (#3030316)

❑ Bateman Fellowship† (#3071248)

❑ Bateman Prize* (#3071254)

❑ Benzinger Memorial (#3071466)

❑ Bourgin Fellowship† (#3071526)

❑ Brahana and Math Instructor Award* (#3075500)

❑ Kuo Tsai Chen Award* (#3071574)

❑ Coble Memorial Lectureship (#3075820)

❑ Cogdal Math Library (#3071546)

❑ Elizabeth R. Bennett§ (#0062778)

❑ Goldberg Memorial Math Fund (#3031593)

❑ Greenwood and Trjitzinsky Prize* (#3041392)

❑ Healy Jr. Fund (#3072182)

❑ Hogan Scholarship§ (#3072301)

❑ Hohn-Nash Scholarship§ (#3072826)

❑ Mathematics Fellowships† (#3042439)

❑ Mathematics Library Fund (#3032384)

❑ Mathematics Unrestricted Funds (#3032346)

❑ Nancy Anderson Library Endowment Fund (#3071042)

❑ Number Theory Fund (#3032964)

❑ Parker Memorial* (#3073141)

❑ Reiner Memorial Award* (#3073289)

❑ Schark Student Aid† (#3073396)

❑ Suzuki Memorial (#3034081)

❑ Trjitzinsky Memorial Lectureship (#3073810)

❑ Jerry Uhl NetMath Fund§ (#3043558)

❑ Barbara J. Waldemar† (#0062266)

†*support for fellowships*   §*support for scholarships/student aid*   **support for prizes/awards*

Name _____   Telephone _____

Street Address _____

City _____   State _____   Country _____   Zip Code _____

❑ Enclosed is my check for $_____ made payable to UIF/Department of Mathematics.

❑ I authorize the U of I Foundation to collect my gift of $_____ through the credit card checked.

  ❑ Visa   ❑ MasterCard   ❑ Discover   ❑ American Express

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This is a joint gift. Please also credit: _____

May we add your name to our published list of donors?   ❑ yes   ❑ no

Contributions should be sent to:
The University of Illinois Foundation, Harker Hall, 1305 W. Green Street (MC-386), Urbana, IL 61801; (217) 333-0810.
5M 5TJ

First Bateman Fellowship in Number Theory to be awarded

The first Paul T. Bateman Fellowship in Number Theory will be announced in May 2002. The Fellowship will be awarded to a graduate student actively working on research and writing his/her thesis in number theory at the University of Illinois at Urbana-Champaign.

The idea for a number theory fellowship originated with Bruce Berndt to honor Professor Bateman and his many contributions to number theory and the department. The first major gift was given by former faculty member John T. Selfridge. With the support of gifts from Professor Selfridge and many friends and colleagues, Paul and Felice Bateman completed this permanent endowment this year.

Professor Bateman (faculty emeritus) received his Ph.D. from the University of Pennsylvania in 1946, under Hans Rademacher. Following two years at both Yale and the Institute for Advanced Study, Bateman joined the department at UIUC in 1950. During his tenure he has supervised twenty doctoral dissertations in number theory, nineteen at Illinois. His research has covered a wide range of topics including sums of squares, the distribution of prime numbers, Beurling's generalized prime numbers, modular forms, geometric extrema, the coefficients of the cyclotomic polynomials, and arithmetic functions. He has written joint papers with more than 20 different co-authors.

Several members of the current number theory faculty were appointed during Professor Bateman's tenure, namely Professors Berndt, Diamond, Janusz, Philipp, Reznick, Stolarsky and Ullom. Bateman has also served on the Board of Trustees of the American Mathematical Society and was Associate Secretary of the AMS Central Section.

The Paul T. Bateman Fellowship in Number Theory is a permanent endowment that will continue to grow through the years through earned interest and added gifts. We thank all who have participated in the creation of this award, which will benefit many students in the years to come.