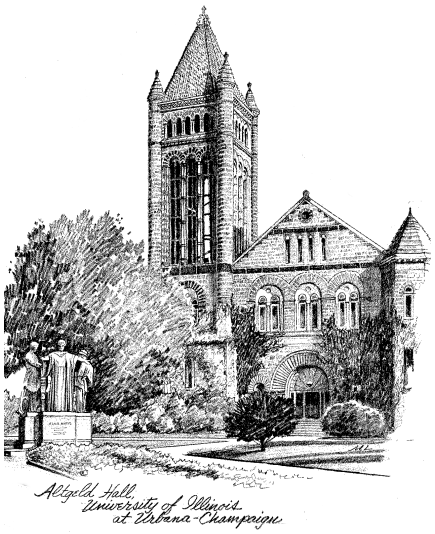
Math Times



Department of Mathematics *Spring 2001*

Letter from the Chair

This newsletter comes out at a time when we are all looking forward to the end of a long, and sometimes hard, winter. But during this time, the Department of Mathematics has been anything but dormant. This newsletter will give you some idea of the range of activity in the Department during this time, but it gives only a snapshot of the reality. There were classrooms full of undergraduate and graduate students busy with courses at all levels, computer laboratories in constant use, a great range of seminars every week, special talks like the Mathematics in Science and Society talks, and much more.

The NSF VIGRE grant has been having the type of impact on the department that we expected it would have. There have been improvements in the graduate program, increases in the number of postdoctoral faculty members, and more interactions between the faculty, graduate students, and undergraduate students. One of the more exciting developments of the VIGRE grant has yet to occur: the summer research experiences for undergraduates. Three 8 week long programs are planned for this summer, with about 24 participants. There were close to 70 applications for admission to the program and we anticipate that this will be an exciting experience for a number of our junior colleagues. See http://www.math.uiuc.edu/VIGRE/reu for more information about this new program.

This past summer and fall was also the time when a group of our faculty members collaborated on preparing a proposal to NSF for funding for a new mathematical sciences institute here at the University of Illinois. NSF has called for proposals for as many as four new institutes. The principal investigators for our proposal are Joseph Rosenblatt, John Sullivan, and Douglas West in the Department of Mathematics and Hassan Aref in the Department of Theoretical and Applied Mechanics. They have involved many other faculty members from around campus in this proposal for an institute that will promote both fundamental and interdisciplinary research. While there is no certainty that we will get a site visit, let alone get this proposal funded, the effort of putting the proposal together has had a positive impact. The process of preparing this proposal led to many new links with faculty members in engineering and the life and chemical sciences. It has raised possibilities for future collaborations through joint meetings, research programs, and teaching initiatives. No matter what the fate of this proposal, the discussions during its preparation have had a valuable impact on mathematical life at the University of Illinois.

The most time-consuming activity so far this spring has been the interviewing conducted by the department in its search for new faculty members. The hiring process is not yet complete, but at this point we have hired six new assistant professors. In addition, we have hired six new postdoctoral faculty members. These new faculty members will have a very noticeable effect on life in the Department this coming fall. Keep your eyes open for the fall issue of the *Math Times* for a complete wrap-up of the hiring process this year.

Let us hear from you! If you have news that we would be interested in knowing, send us a letter. Come to the next AMS meeting in San Diego in January 2002. We can meet at the reception that the Department of Mathematics will again sponsor at this upcoming meeting.

Joseph Rosenblatt

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

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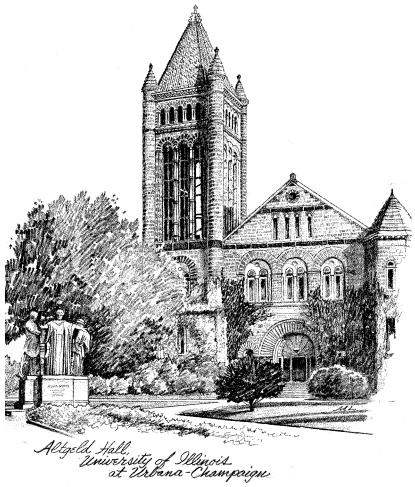


Monograph project, new Ph.D.s to bolster library's collection

The Library Monograph Dedication Project is now underway. The Department of Mathematics has generously offered to donate a book to the Mathematics Library for every Ph.D. awarded by the department. Librarian Tim Cole will maintain a list of monographs from which eligible students may choose. Each monograph will have a commemorative bookplate, enabling the student to dedicate the book to an appropriate person. To assist students in choosing an appropriate book, a website has been established (www.library.uiuc.edu/mtx/collectiondevelopment/Phd.asp) which includes a list of books the Mathematics Library would like to order.

Reception hosted in New Orleans

The third annual University of Illinois reception at the Joint Mathematics Meetings was held January 12, 2001, in the St. Charles Suite of the New Orleans Marriott Hotel. Nearly 100 alumni, faculty, and friends enjoyed a lagniappe buffet as they met with old friends and new ones from Illinois. Department chair Joseph Rosenblatt welcomed guests to the special event and provided an update about mathematics at the University of Illinois. Various winners took home orange and blue themed door prizes, which included UI calendars, mouse pads, and photograph books. Robin Fossum, UI Foundation, and Carolyn Pribble, LAS Administration, helped host the event. Be sure to join us for the fourth annual reception in San Diego next year to renew acquaintances with your UI friends!

Jerrard retires as *Math Times* editor

Margot Jerrard retired this past fall as editor of the *Math Times*. Under former chair Ward Henson, she planned and started the *Math Times*, and wrote and edited every issue from the first one in Spring 1991. She has enjoyed working with the people in the department and is looking forward to doing feature articles about a number of UIUC mathematicians and their work. These articles will be published in the *Math Times*. The first of these appears in this issue (see page 3).

Now serving as editor of the Math Times is **Tori Corkery**. Tori, who joined the department in November 1998, is the department webmaster. She also designs and produces a variety of brochures, literature, and posters for the department. She has been serving as assistant editor of the *Math Times* for the past three issues and is looking forward to working with faculty, students, and alumni on future issues.

If you have ideas for articles or have alumni news, please send it via e-mail to mathtimes@math.uiuc.edu.

Correction

In the Fall 2000 issue of *Math Times*, we inadvertently left out one of the organizers of the Millennial Number Theory Conference. Nigel Boston was one of the organizers along with Professors A.J. Hildebrand, Bruce Berndt, Harold Diamond, Walter Philipp, and other local number theory faculty.

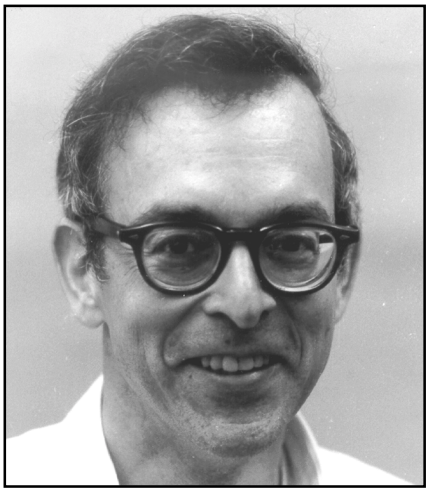
Diamond enjoys math problems and working with students

by Margot Jerrard

Calculus is a required course for many students, a gateway for those who are studying science, engineering, architecture, and business, as well as mathematics. But as Professor Harold Diamond observed a few years ago, many students just sit passively through calculus classes, not doing well, not doing badly, but not very interested, and some even get turned off completely. Since calculus is so important and because the students' responses are often so indifferent, he began to ask if there might be a better way to teach it.

Several years ago he volunteered to participate in the active learning style of calculus instruction developed at Harvard University. The goal of this teaching style is to instill in students a deeper understanding of calculus as a way of approaching mathematical problems rather than just a collection of formulas. To do this, an attempt is made to engage the students to a greater extent than in the traditional class. Students are expected to read and write somewhat more. Also, they work together in small groups in class on examples which, in regular classes, would simply be told to them in lectures. More of the class period is spent on the students' work and in discussing principles and less on listening to lectures. This kind of instruction does not have the efficiency of the classic lecture style because students generally do not find the right path to solve problems as rapidly as an experienced lecturer could present material. To insure adequate coverage of required material, participants in this program attend a two-hour lab session each week, without receiving additional course credit. Another feature of this course is that students make significant use of graphing calculators.

Finally, to insure technical competence, students in this program must demonstrate their ability to do expected calculations on a mastery exam. Those who do not score at least 85% take the examination again (in some cases repeatedly) until they pass it. For some students, the demands are too high and they go back to a traditional calculus class.



What is the response of this type of instruction? The department is assessing all of its different methods of teaching calculus, but the results will not be known for several years. To an observer walking past an active learning classroom, the scene appears pretty disorderly, with students moving around and talking with each other. Nearly all of the students like the close personal contact with the instructor and classmates and are interested in what they are doing. For a few, there is too much work required or they don't have the patience to work in small groups.

Diamond enjoys mathematical problems and working 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.

Each spring Professors Diamond and Hildebrand organize 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. This spring, Professors Diamond and Hildebrand are also offering a problem-solving seminar for a small group of talented undergraduates.

Diamond joined the department 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 is the first in a series of articles planned for the Math Times that will highlight the activities of current faculty in the department.

NetMath internet distance education at Illinois

by Jerry Uhl

In 1984, Jacob T. Schwartz wrote: "*Many conventional academic skills simply amount to the ability to select and apply algorithmic or near-algorithmic procedures rapidly and correctly... Courseware can concentrate on one skill at a time, in a manner impossible for a textbook and hardly available to the classroom teacher, namely by asking the student to handle only that part of a procedure on which pedagogical stress is to be laid, while other aspects of the same procedure are handled automatically by the computer.*"

In 1988, Horacio Porta and I got a chance to see the then new Mathematica system. It wasn't Mathematica's impressive calculational ability that caught our eye, but rather the ability to mix word-processed text and as many graphics as one would ever want between executable Mathematica code. Porta and I looked at each other and said, "This could lead to a great way of teaching mathematics in the spirit of Jack Schwartz."

With help from the NSF, soon Bill Davis from Ohio State and Bruce Carpenter of UIUC joined us and (between sessions for beer, brandy and wine) we began development of the *Calculus&Mathematica* series of courses that have now grown to include differential equations, matrix theory and probability theory. Each of these courses is based on the idea that: Calculation and plotting set up theory which in turn sets up more calculation and more plotting which in turn sets up more theory which .... The courses were (and are) taught on campus without formal lectures; the emphasis is on what the students actually do.

Jennifer Phillips used Mathematica to create this flower (rose plotted using spherical coordinates; stem plotted using normals and binormals).

In 1991, we met rural high school teachers, Shirley Treadway and Mark Calvert, who complained about the fact that their schools were too small to offer calculus and that they had nothing to offer their best students in the senior year. Treadway and Calvert saw the way campus students were learning and suggested that their students could learn the same way without leaving their schools. Soon, in cooperation with the University's Division of Academic Outreach, Office of Continuing Education, NetMath was born with twelve students mailing their computer work to Urbana on floppies in envelopes. Most of the students did fine and were pleased to obtain University of Illinois credit, thus being able to enroll at the University the next year with background on a par with that of their classmates from the suburban Chicago high schools.

My experience watching a son grow in mathematical abilities so rapidly by taking several computer-aided learning courses of such high quality has been amazing.

When the internet became available, NetMath jumped in and has been living on the internet ever since under the directorship of Debra Woods, who administers the program and supervises the team of UIUC undergraduate mentors who take personal responsibility for each NetMath distance student.

In the past five years, adult learners have formed a growing percentage of NetMath students. Some of them take NetMath courses through the university's Continuing Engineering Education Program. These students are fun to teach because, like the rural high school students, they really want the math.

On a personal level, the NetMath program has been very rewarding to me. For example, in 1970, Steven Lottes took Math 347 from me; today he has his Ph.D. and works at Argonne National Laboratory in petroleum refining and mathematical furnace modeling. Steven's son James exhausted his high school's supply of math courses when he was 14. Over the last two years James has taken Vector Calculus, Differential Equations, Matrix Theory, and

To learn more about NetMath, visit http://www-cm.math.uiuc.edu or http://netmath.math.uiuc.edu

Probability through NetMath. Last year Steven sent me his view of the NetMath courses:

"To say the least, I am very impressed with both the depth of understanding and the proficiency that this method of learning provides to students. My experience watching a son grow in mathematical abilities so rapidly by taking several computer-aided learning courses of such high quality has been amazing. James has gained abilities that took me several years of real world experience working in a research environment on difficult problems to gain (even though I was well prepared to enter that real world by the professors and courses I took at UIUC and elsewhere)."

To learn more about NetMath, visit www.cm.math.uiuc.edu or netmath.math.uiuc.edu. If you want to help out a potential NetMath student who cannot afford the steep University tuition, please email Professor Uhl at juhl@cm.math.uiuc.edu. The UI Foundation set up the Jerry Uhl NetMath fund in 2000 to provide financial assistance to students. If you would like to donate to the Jerry Uhl NetMath fund, please see the donation form on page 11.

Jerry Uhl is a professor of mathematics at the University of Illinois at Urbana-Champaign and is a member of the Mathematical Sciences Education Board of National Research Council.

MSS speakers link math, science and society

Steven Bradlow and **Richard Laugesen** organized the 2000-01 *Mathematics in Science & Society* lecture series.

This fall, Donald Saari, a mathematics professor in the Departments of Economics and Mathematics at the University of California at Irvine, spoke on mathematics and democracy. Saari used mathematical demonstrations to show that the results of an election depend on the procedure used at least as much as on voter preference.

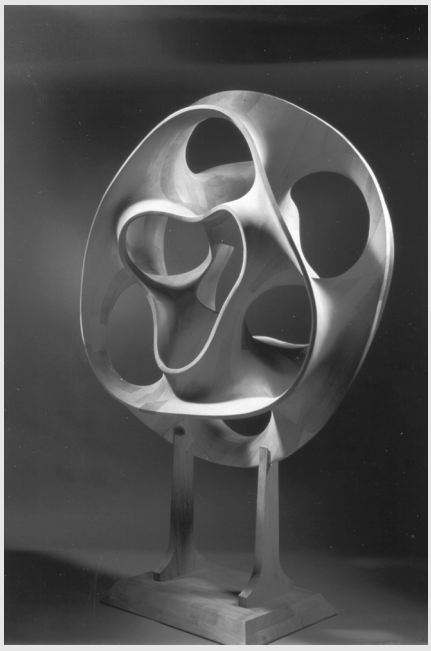
Brent Collins, a sculptor who brings mathematics and art together, presented a lecture in December. Collins described the way in which his bronze and wood sculptures—modeled after mathematical structures such as the Mobius strip—communicate mathematical concepts as well as human feelings. His artistic endeavors have inspired development of computer software designed to prototype images. The software was created by Carlo Sequin at the University of California at Berkeley. Collins' talk and sculptures were also admired by mathematicians from Wolfram Research.

In February, Richard Herman, a mathematician and Provost at UIUC, presented a lecture on mathematics and science funding and the political process.

Richard Stone, a senior consultant in Operations Research at Northwest Airlines, presented a lecture on airline planning problems. The list of things that need planning seems endless: crews, reservation agents, luggage, flights, through trips, maintenance, gates, inventory, and equipment purchases. He discussed how one might quantitatively approach problems so as to intelligently support the planning process.

In April, Mary Gray, American University, Washington, D.C., presented a lecture about statistics, sex and the law. She discussed how victories for sex equity are due, at least in part, to statistical evidence brought before the courts. Gray was the first president of the Association for Women in Mathematics.

Visit the MSS website for upcoming lectures (www.math.uiuc.edu/MSS).



Sculpture by Brent Collins.

2001 department achievement awards presented

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

H.R. Brahana Prize

This year's winner, **Michael Geline**, has taken a dazzling array of twelve mathematics courses beyond calculus, including the entire graduate preparatory option in mathematics and several upper level graduate courses, while being a major in nuclear engineering.

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-Trjitzinsky Prize

The Greenwood-Trjitzinsky Prize recognizes the best paper in mathematics written by an undergraduate. This year's first prize winner was **William Cuckler**, a senior majoring in math and minoring in computer science. His paper on "Reducibility of configurations in the pancake problem" was written under the supervision of Professor Doug West. Second prize was awarded to **Michael Baym**, a junior double major in math and physics, who wrote on "Cubic Thue equations" with the supervision of Professor Michael Bennett.

Salma Wanna Memorial Award

Michael Baym received the Salma Wanna Award. Although Baym is only a junior, he has already taken four 400-level mathematics courses and done significant research projects in number theory with Professors Michael Bennett and Nigel Boston.

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.

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

The actuarial award went to **Ramakrishna Duvvuri** from Bloomington, IL. Duvvuri will graduate in actuarial science with three of six professional examinations required for associate membership in the Society of Actuaries. After graduation he will work as an actuary, though he is considering returning to graduate school in a few years.

Undergraduate Major Award in Mathematics

This award was presented to **William Cuckler.** He will graduate with the highest distinction in mathematics, having taken the full honors program in mathematics and upper graduate level courses beyond the honors program.

Undergraduate Major Award in Math and Computer Science

Mark Hoemmen was awarded the Math/CS award. Hoemmen was the only Math/CS senior with a 4.0. He is a past winner of the Computer Science Department Snyder Award and the Department of Mathematics' Greenwood-Trjitzinsky Prize.

Undergraduate Major Award in Teaching of Mathematics

Mathew John Moran was awarded the Teaching Award. He has maintained an A average in mathematics courses while taking the honors level courses such as Math 296 and 347. He is currently assisting Professor Randy McCarthy doing a VIGRE teacher training for

undergraduates. Moran was one of the first winners of the Elizabeth R. Bennet Scholarship in mathematics.

Graduate Awards

Bateman Prize in Number Theory

Mark Bauer was this year's winner of the Bateman Prize. Bauer is a Ph.D. student of Nigel Boston, working on cryptography and Diophantine equations. He was the first person to solve the fifth of Koblitz's fundamental problems on hyperelliptic curve cryptography and has gone on to implement some cubic superelliptic cryptosystems. The Bateman Prize is awarded in recognition of outstanding research in number theory.

Irving Reiner Memorial Award

The Reiner Prize is awarded to one or more graduate students in recognition of outstanding scholastic achievement in the field of algebra. This year, the award was presented to two graduate students, **Donghi Lee** and **Donghoon Hyeon**. Lee is a sixth-year student studying with Professor Sergei Ivanov. In her thesis, Lee proved two remarkable results about free groups. She has written three articles with complete proofs of her results, two of which have been accepted for publication in international journals. Hyeon is a fifth-year student working in the area of algebraic geometry under the joint supervision of Professors Steven Bradlow and William Haboush.

Kuo-Tsai Chen Prize

This year, the Chen Prize was awarded to two graduate students, **Lia Petracovici** and **Donghoon Hyeon**. Petracovici is a fifth-year student studying complex dynamics under the direction of Professor Aimo Hinkkanen. Hyeon also received the Reiner Memorial Award this year. The Chen Prize was established by the family and friends of Professor K.-T. Chen and is awarded in alternate years in recognition of outstanding achievement by a graduate student whose research interests lie in the area of the relationship between geometry and analysis or the relationship between algebra and analysis.

Hohn-Nash Award

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. Two prizes are given each year. This year's winners are **Kwang Shin** and **Thomas Kuhnt.** Shin is a third-year Ph.D. student from Korea working on an intriguing Schrodinger problem from mathematical quantum mechanics. Kuhnt, interested in geometry and economics, has been working on a challenge from financial mathematics.

Recipients of the Department TA Instructional Award were not available in time for this publication.

Staff Award

Outstanding Department Non-Academic Staff Award

Tori Corkery was this year's recipient of the Staff Award. Corkery is the department webmaster and has been with the department for 2 1/2 years. This award recognizes outstanding staff contributions to the department and the university through leadership and work excellence. This is the second year that this award has been given.

Campus honors awarded to Baxter and Evans

Kristine Baxter has been awarded the College of LAS Award for Excellence in Undergraduate Teaching for Graduate Teaching Assistants and the Campus Award for Excellence in Undergraduate Teaching. Baxter is a sixth-year student studying topology with Professor Randy McCarthy.

Each year, one of the teaching assistants who received the department's teaching award in the previous year is nominated for the Campus Teaching Award. The campus recognizes five members of the faculty and five graduate teaching assistants for this recognition each year. Winners receive a significant one-time monetary award as well as a recurring increment to their annual salaries.

Professor E. Graham Evans Jr., Undergraduate Programs Director, has been awarded the Campus Award for Excellence in Advising Undergraduate Students. This award is designed to foster and reward excellence in undergraduate academic advising. The primary criteria for selection is evidence that the advisor has had a major and lasting impact on undergraduate students and on their intellectual development through sustained academic advising relationships.

Faculty Notes

Anand Pillay has been awarded a Humboldt Research Award. The Alexander von Humboldt Foundation awards up to 150 such awards annually to foreign scholars who have gained international eminence, of which around 80 are granted to U.S.-based scientists. These research awards are conferred in recognition of lifetime achievements in science. Pillay's research is in model theory, a branch of mathematical logic. He plans to use the research award to spend the second half of the year 2001 in Berlin, Germany, working with colleagues at the Humboldt University.

Jared Bronski has been awarded a Sloan Research Fellowship. Bronski received his degree from Princeton in applied math in 1994 and did postdocs at IMA and Stanford before coming to UIUC in 1998. His research interests are in nonlinear waves and fluid mechanics, primarily passive scalar transport. The Sloan Research Fellowships were established in 1955 to provide support and recognition to young scientists. Selection procedures are designed to identify those who show the most outstanding promise of making fundamental contributions to new knowledge.

Sergei Ivanov has been chosen as a 2000-01 University Scholar. The University Scholars Program is the premier recognition accorded to faculty at UIUC by their colleagues. Now in its 16th year, the program provides $10,000 to each scholar to use to enhance his/her career. Ivanov's work is in the theory of groups, particularly in the theory of infinite groups.

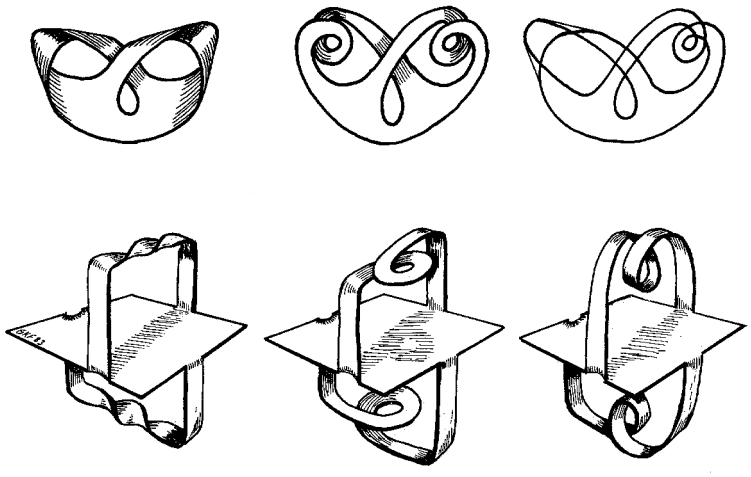
Sean Sather-Wagstaff was awarded an NSF Mathematical Sciences Postdoctoral Research Fellowship for 2001-04. Sather-Wagstaff, a VIGRE Research Assistant Professor who joined the department in Fall 2000, works on homological conjectures in commutative ring theory.

Julian Palmore was honored for his work as editor of PHALANX, the Bulletin of Military Operations Research, with a presentation of the Impact Award and Plaque at a board of directors' dinner of the Military Operations Research Society (MORS) in December 2000. He will serve as a member of a transition panel in Alexandria, VA, to select an editor-in-chief for *Military Operations Research Journal*.

In January, he participated in a MORS-sponsored workshop on Chemical-Biological Weapons of Mass Destruction in McLean, VA, and in March, he spoke at a symposium on Homeland Security at Johns Hopkins University Applied Physics Laboratory. Palmore will serve as chair of the AMS Menger Prize Committee at the INTEL-International Science and Engineering Fair (ISEF) in San Jose, CA, in May 2001.

This summer Professors **Palmore** and **Joseph Rosenblatt** will present invited talks at the conference on Non-Hyperbolic Dynamical Systems at Georg-August-Universitat in Gottingen, Germany. Only five speakers from the U.S. were invited to present lectures.

Nigel Boston recently gave colloquia at the University of Illinois at Chicago and Notre Dame, and spoke on group theory at the University of Utah, and number theory at Ohio State. Professor Boston gave a talk on coding theory in Paris at WCC 2001, and will speak on signal processing at their annual meeting in Salt Lake City in May.



The Owl and the Pussycat. One of Wolfgang Haken's six incompressible and boundary incompressible surfaces spanning the figure-eight knot is a Seifert surface which is embedded in space as a disc with two oppositely twisted ribbons attached to its circumference. The owl proceeds from the pussycat by a Seifert move that changes the twisting of ribbons into curling or writhing. From "A Topological Picturebook" by George Francis.

In Fall 2000, **John Sullivan** was invited to speak at three European conferences on art and mathematics. In September, he presented the sphere-eversion video "The Optiverse" at the colloquium "Arts et Mathematiques" in Maubeuge, France. In October, Sullivan spoke at the meeting "Matematica, Arte e Cultura" in Bologna, Italy, where some of his computer graphics were part of an exhibit consisting mainly of prints by M.C. Escher. In November, at the meeting on "Multimedia Tools for Communicating Mathematics" in Lisbon, Portugal, he demonstrated the interactive software behind "The Optiverse." Fine-art prints of three of Sullivan's mathematical images were included in the exhibit "Art and Mathematics 2000" at the Cooper Union in Manhattan in December, and have now moved to the Koussevitzky Art Gallery in Pittsfield, MA.

C. Ward Henson gave an invited talk entitled "Model theory in functional analysis" at the annual meeting of the Association for Symbolic Logic, held March 10-13 at the University of Pennsylvania.

Henson served as a member of the 2001 Committee of Visitors (COV), which evaluated the work of the Division of Mathematical Sciences (DMS) of the National Science Foundation during its meeting held February 7-9 at NSF. This evaluation is done every three years. Each COV prepares a report for the NSF Directorate giving its assessment of the DMS and its recommendations for the future. This year's COV paid special positive attention to the Mathematical Sciences Initiative which has been undertaken by the DMS with strong endorsement of the NSF Director, Rita Colwell.

ASL office leaves Urbana

The business office of the **Association for Symbolic Logic** (ASL) has left the UIUC Department of Mathematics after 19 years. The offices will now be housed at Vassar College. This reflects the fact that **C. Ward Henson** has ended his service as Secretary-Treasurer of the ASL. His successor is Professor Charles Steinhorn of Vassar. Henson will continue to serve the Association in the position of ASL Publisher, in which he will be responsible for the administration of all ASL publishing, including its journals (*The Journal of Symbolic Logic* and *The Bulletin of Symbolic Logic*, comprising 2500 pages per year currently) as well as its fledgling book publishing program.

2000 Putnam Competition

The 61st annual Putnam Competition was held December 2, 2000. Thirteen UIUC students participated in this contest, a record turnout in recent history. The UIUC team, coached by Professors H. Diamond and A.J. Hildebrand, placed 35th among 431 participating colleges. The top local scorers were **Kaushik Roy** and **David Dueber**, who received 33 and 31 points, respectively, out of 120 possible points, and placed 106th and 120th out of the more than 2,800 participating students nationwide.

The following statistics provide an indication of the difficulty of this contest: only 20 participants had a score of more than 60 points (50%); a score of 10 points, equivalent to getting one correct problem out of the 12 problems on the contest, was enough to place among the top 25% of participants; and more than half of the participants scored no points, so the median score on this contest was 0!

2001 UIUC Undergrad Contest

The 2001 UIUC Undergraduate Math Contest was held Saturday, April 21, 2001. Winners receive cash and book prizes and were recognized at the departmental awards ceremony. Names of the winners were not available in time for this publication, and will be announced in the fall issue of the *Math Times*.

A new activity this year is a problem-solving seminar, organized by Professors Diamond and Hildebrand. Six students are currently participating in this seminar. The students work individually, under the guidance of faculty members, on problems posed in mathematical journals. The work is then presented and discussed in biweekly group meetings. Students are encouraged to write up their solutions, submit these to the journal, and be recognized by having their name listed among those who solved the problem, and perhaps even have their solution published.

More information about contest-related activities can be found at the UIUC Math Contests webpage at http://www.math.uiuc.edu/contests.html.

Mathematical proofs, like diamonds, are hard as well as clear, and will be touched with nothing but strict reasoning. Proofs are out of the reach of topical arguments, and are not to be attacked by the equivocal use of words or declaration, that make so great a part of other discourses. **—John Locke**

Faculty and postdocs to join mathematics faculty in Fall 2001

The department is pleased to announce some of the faculty and postdocs that will be joining the department this fall. The hiring process is still on-going this spring. Watch for your fall issue of the *Math Times* for a complete listing and biographies of the new hires.

Assistant Professors

Robert Bauer received his Ph.D. in 1997 at UIUC under the supervision of Professor D. Burkholder. He is currently a visiting assistant professor at the Georgia Institute of Technology. His research interests include stochastic analysis on manifolds.

Rinat Kedem received her Ph.D. in mathematical physics in 1993 from SUNY-Stony Brook. She specializes in representations of affine algebras, quantum groups, and integrable models. Kedem is currently visiting at the University of California at Berkeley, and will be spending the fall term at IPAM at UCLA.

Florin Boca received his Ph.D. in 1993 while working with Sorin Popa at UCLA. He is currently a research fellow of EPSRC in the School of Mathematics at Cardiff University in England. He has wide ranging interests in operator algebras, number theory, and mathematical physics.

Scott Ahlgren has established himself as an extremely able mathematician since completing his Ph.D. studies under the supervision of Wolfgang Schmidt at the University of Colorado at Boulder. He has held a faculty position at several universities in the last several years, while publishing or submitting for publication 17 research articles in number theory.

Ilia Binder is currently a Benjamin Peirce Assistant Professor at Harvard University. He has been there the last couple of years since completing his Ph.D. degree under the supervision of Nikolai Makarov at the California Institute of Technology (Caltech). Dr. Binder's work is in complex analysis, particularly in the boundary behavior of the classical harmonic measure.

Kevin Ford received his Ph.D. at UIUC in 1994 under the direction of Professor H. Halberstam in the area of number theory. His thesis dealt with a variant of the classical Waring problem. Since receiving his degree, he has held positions at the University of Texas at Austin and the Institute for Advanced Study in Princeton, NJ. He is currently on the faculty at the University of South Carolina at Columbia.

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.

Jorge Rivera-Noriega will receive his Ph.D. from the University of Missouri-Columbia under the supervision of Dr. Steven Hofmann. His research interests are related to harmonic analysis and partial differential equations.

Evgueni Vassiliev will receive his Ph.D. from the University of Notre Dame under the direction of Professor Steven Buechler. His research field is mathematical logic, specifically model theory.

Bernhard Lamel received his Ph.D. in 2000 from the University of California at San Diego. His research is in the area of geometry and several complex variables, with his primary interest in properties of mappings of real submanifolds in complex spaces of different dimensions. He is currently on a European Union research fellowship in Stockholm.

VIGRE Postdocs

Funding for the VIGRE Research Assistant Professor appointments began in Fall 2000 with a grant received from the National Science Foundation. Each appointment is for three years.

Alica Miller will receive her Ph.D. from Michigan State University. Interested in compact minimal Abelian flows (restrictions, skew-products, skew-morphisms, regular almost periodicity), her thesis is titled "Some constructions with compact minimal Abelian flows."

Christopher French will receive his Ph.D. in algebraic topology from the University of Chicago. His thesis "The equivariant J-homomorphism" was completed under the direction of Professor J.P. May.

David Sherman will receive his Ph.D. from UCLA under the direction of Professor Masamichi Takesaki. His area of specialization is operator algebras, especially the modular theory of von Neumann algebras.

Professor Ranga Rao retires after 35 years with department

Professor Ranga Rao retired this spring after more than 35 years at UIUC. Rao did his graduate work at the Indian Statistical Institute in Calcutta, India, and received his Ph.D. from the University of Calcutta in 1961. He came to the University of Illinois in 1961 as an Assistant Professor and then returned to the Indian Statistical Institute in 1963. He returned to the University of Illinois in 1965, became an Associate Professor in 1967, and a full Professor in 1974. He has been a visiting Professor at the Institute for Advanced Study, Princeton (1968 and 1976), the University of California at Los Angeles (1971), Tata Institute of Fundamental Research, Bombay (1977 and 1992), Indian Statistical Institute, New Delhi (1978), ETH, Zurich (1978), and MIT, Cambridge, MA (1985).

He has worked and published in different areas, such as statistics (1959 with R.R. Bahadur), asymptotic expansions in the central limit theorem (1961, Ph.D. thesis), limit theorems on locally compact abelian groups (1963 with K.R. Parthasarathy and S.R.S. Varadhan). He then changed his field to Lie groups. He has published in representation theory of semi-simple Lie groups and Lie algebras (1965 with K.R. Parthasarathy and V.S. Varadarajan) nilpotent orbital integrals, and more recently in the theory of Weil representation.

Rango Rao

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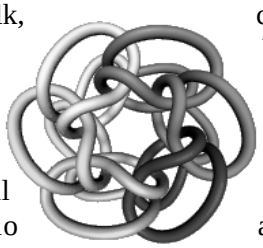
Cryptography: Here's what we *can* tell you

The highlight of spring semester at the Illinois Center for Cryptography and Information Protection (ICCIP) was a visit on April 6 by Dr. Simon Singh, best-selling author of "Fermat's Enigma" and "The Code Book" and TV presenter of the recent PBS series "The Science of Secrecy." This event was cosponsored by ICCIP, the Coordinated Science Laboratory, and the Department of Mathematics. Before Singh's talk, Professor John Lawrence of the University of Waterloo spoke on the breaking of the German Enigma machine by group theory; he even brought his own Enigma machine with him. Also during his visit, Singh met with local schoolchildren and appeared on the radio program Focus 580 with Nigel Boston, Director of ICCIP.



In early January, three mathematics department faculty and ICCIP members, Nigel Boston, Iwan Duursma, and Andreas Stein, travelled to Paris to attend WCC 2001 and to collaborate with Francois Morain's group at Ecole Polytechnique. This is part of a new UIUC-CNRS collaboration and will bring several visitors from France to UIUC. They are also planning similar cooperative agreements with Gerhard Frey's group in Essen, Germany, and with CACR in Canada.

There is now a large group of graduates (from mathematics, computer science, and electrical and computer engineering) and undergraduates working on cryptography. Currently, their projects include building a replica German Enigma machine, which is complicated since no blueprints exist, and a chip for hyperelliptic curve cryptography.

Professors Richard Blahut and Boston are currently team-teaching cryptography to a packed audience. Professors Stein and Boston are continuing the Information Protection Seminar, and Professors Pierre Moulin and Ralf Koetter, of the Department of Electrical and Computer Engineering, have started up a new seminar in watermarking at the Beckman Institute. Their work was recently featured in the Chicago Sun Times. Visit the ICCIP website for upcoming events (www.iccip.csl.uiuc.edu).

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