

# Math



# Times

Department of Mathematics

Fall 1999

## Letter from the Chair

Dear Colleagues and Friends of the Department,

This summer Philippe Tondeur the former chair of the department, left Urbana to go to Washington, DC, where he is now the National Science Foundation's Director of the Division of Mathematical Sciences. At the same time I became the department chair.

My Ph.D. is from the University of Washington, and my research is in the field of harmonic analysis. I joined the department in 1994, after being at Ohio State for 20 years. I look forward to working with the colleagues and friends I have made in the five years that I have been here at UIUC.

It is a challenging job to chair a first rate mathematics department with its excellent and productive faculty. My mission will be to do all that I can to facilitate the research of the faculty, in order that they can continue to discover new mathematics and to disseminate

it. Also I will be responsible for promoting the best education of students, at all levels, from their first mathematics courses, even before calculus, through the Ph.D. These two missions, research and teaching, belong together.

We teach students from all over the world. This is a great responsibility. In addition to the Americans, students come to the department from 32 countries. We want our mathematics majors and master's degree students to be well educated mathematically, and able to take

their places in this technological society. We want the doctoral students, directed by their mentors, to learn how to do research and to discover new theorems. Most of these graduate students also contribute to our mission as teaching assistants.

After they earn their degrees, most of our students stay in the United States, but many go to other countries. All of them rely on the education they have received here. Our teaching and research have a world wide impact, and we want them to be of the highest quality.

I look forward to continuing to work with my colleagues, the students and the College of Liberal Arts and Sciences at UIUC. Have a productive and happy year!

Yours,

Joseph Rosenblatt



## MWPDE Seminar

On October 23-24, the Department of Mathematics was host to the Fall 1999 Midwest Partial Differential Equations Seminar. Nine visiting mathematicians spoke on their research.

The conference was organized by Jared Bronski, Robert Jerrard, and Richard Laugesen. For more information about the conference, see the website at [www.math.uiuc.edu/~laugesen/mwpde.html](http://www.math.uiuc.edu/~laugesen/mwpde.html)

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## High School Math Course to be Developed

Emeritus Professor Anthony Peressini is working with other mathematicians on the University of Chicago School Mathematics Project to develop a new course, "High School Mathematics from an Advanced Standpoint." This course, which is intended for future and current secondary school mathematics teachers, will be based on the pre-calculus mathematical content of high school courses, but from an advanced standpoint. It will provide an opportunity for the students to study the subjects they will be teaching from a broad and mathematically sophisticated point of view and will include abstracting, generalizing, applying and otherwise extending mathematics. The materials will examine concepts from the perspective of the undergraduate mathematical sciences curriculum, from a historical perspective, and from a broader curricular perspective with the idea of comparing and contrasting approaches to the mathematics. The writing, production and field testing of these materials will take place over the next three years.

## Visiting Appointments

Among appointments to the faculty this academic year are the following: Visiting scholars for this academic year include **Evgenii Gordon** and **Margaret Symington**. Professor Gordon, from Nizhnii Novgorod State University, Russia, has research interests in model theory and its applications in analysis. Professor Symington, on leave from the Georgia Institute of Technology, and most recently a postdoc at the University of Texas at Austin, works in symplectic topology, in particular on methods of constructing symplectic 4-manifolds.

**Margit Messmer** and **Karen Mortensen** have been appointed as visiting lecturers, and **Debra Woods** has been appointed as lecturer. **Alejandra Folguera** and **Erik Talvila** are each in the second year of visiting appointments as assistant professors.

## Mathematics Colloquium

Jennifer Chayes and Christian Borg, co-heads of the Theory Group at Microsoft in Redmond, WA, will visit the UIUC Department of Mathematics in October. They are both mathematical physicists. Christian Borg has published 45 papers in field theory, statistical physics and mathematical physics. Jennifer Chayes has published more than 50 papers in mathematical physics, principally in probability theory and statistical physics.

## Mathematics from Physics

Last May the Department of Mathematics and the Physics Department jointly sponsored a workshop on "Mathematics from Physics: Recent Trends and New Developments."

Funded by the Campus Research Initiative program, the workshop was designed to promote interaction between mathematicians and theoretical physicists on campus and was organized by mathematicians **Steven Bradlow**, **John D'Angelo** and **Maarten Bergvelt**, together with Robert Leigh, Michael Stone and Shau-Jin Chang from Physics.

Four principal speakers, two mathematicians and two theoretical physicists, each gave a series of three lectures. The mathematicians were Daniel S. Freed from the University of Texas who spoke on "Anomalies and Index Theory" and Duong H. Phong, Columbia University, whose topic was "Supersymmetric Gauge Theories and Integrable Models." The physicists were David Thouless, University of Washington, who spoke on "Topological Quantum Numbers and Physical Measurement" and Cumrun Vafa of Harvard University. His topic was "D-branes and Geometry."

Fifty-six people attended the workshop, including five visitors from other countries. Twenty-five were mathematicians, 23 physicists and eight did not specify. Twenty-three of the participants were graduate students or postdocs.

A record of the workshop can be found at the website [www.physics.uiuc.edu/mathphys99/](http://www.physics.uiuc.edu/mathphys99/). The website contains abstracts of the talks and references.

## You are invited

All present and past math faculty, students, UIUC visitors, and any other friends, are invited to the second annual **University of Illinois gathering** at the American Mathematical Society (AMS) Joint Mathematics Meeting on Friday, January 21, 2000, in Washington, DC. The time will be from 5:00 p.m. to 7:30 p.m.; the place will be announced soon. Visit the AMS website at [www.ams.org](http://www.ams.org) for more information about the Joint Mathematics Meeting.

## New Director

**Graham Evans** is the new director of undergraduate studies. He succeeds Elliot Weinberg who retired this summer. This past academic year undergraduate students from all the colleges took 10,000 mathematics classes on the UIUC campus.

Be sure to visit the undergraduate section of the department's website that was updated this fall. It contains a wealth of information for students.

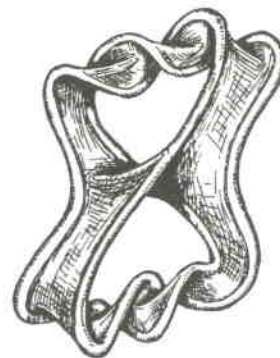
## Graduate Program

"I am very proud of the department's record in educating women," Graduate Studies Director John Gray says. "We now have 60 female students, 21 of them new this fall. Thirty-five percent of the new students are women, and they total 31% of our graduate students."

Professor Gray has announced that 60 students started their graduate studies with the department this fall, a higher number than at many other major universities. Of those, half are American and half are international students. With those who are already here, they bring the total number of graduate students to 195.

The American students represent 26 states, while the international graduate students, new and old, represent 32 countries, including Europe, Asia and Africa.

Forty-three of the new graduate students are teaching assistants; six of these, in addition, have partial fellowships; two teaching assistants also have research assistantships.





## Three New Faculty Join the Department

Chair Joseph Rosenblatt has announced with great pleasure that three excellent mathematicians, **Matthew Ando**, **Richard Gorvett**, and **Marius Junge**, have joined the department this fall as new assistant professors.



*Matthew Ando*

**Matthew Ando** has given invited lectures at many universities in the United States, Canada and Germany, where he was an invited lecturer in homotopy theory at the Max Planck Institut in Bonn. Before joining our department this fall he visited Urbana when he came in April 1988 to lecture on "Elliptic curves and homotopy theory."

Ando received his A.B. in 1988 from Princeton, and his Ph.D. in 1992 from the Massachusetts Institute of Technology. In September 1992 he became an assistant professor at the University of Virginia. He was awarded an NSF postdoctoral research fellowship three year grant in 1993 and in 1996 another NSF postdoctoral fellowship. Most recently he has

been at Johns Hopkins, and before that at M.I.T. He likes to teach and says it can be quite challenging to teach undergraduates successfully.

**Richard Gorvett** was awarded his Ph.D. in finance at the University of Illinois in Urbana in 1998 where he was a visiting lecturer in the Department of Finance. He received his B.S. in mathematics in 1982 and his MBA, specializing in statistics, finance and econometrics, in



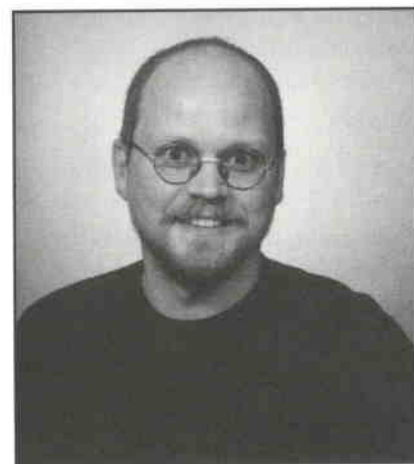
*Rick Gorvett*

1990, both from the University of Chicago. After receiving his Ph.D. he went to New York City, where he was an assistant professor at the College of Insurance. There, among other courses, he taught classes on risk and insurance and financial analysis of multinational insurance institutions and markets.

A Fellow of the Casualty Actuarial Society, Gorvett has received fellowships for his research in actuarial science and for the excellence of his teaching. His papers on risk,

insurance and actuarial science, on credibility theory, and on financial analysis have been heavily mathematical. His recent research involves dynamic financial analysis, the effective duration of liabilities for property-liability insurers, and interest rate models.

While **Marius Junge** has been in the United States for short visits before, this is his first American teaching experience, although he has taught at Kiel, Germany, and Odense University in Denmark. He received both his Ph.D. and the higher degree, the Habilitation, in 1996 from the faculty of mathematics and natural science of Christian Albrechts-Universität, Kiel.



*Marius Junge*

This past year he was invited to Texas A&M and UCLA to talk on his work, and this summer was asked to lecture at the Northern British Functional Analysis Seminar at Edinburgh. Earlier he was invited to Hebrew University in

—continued on page 5

## J.L. Doob Postdoctoral Appointments

**Marcin Mazur** joined our department as a J. L. Doob Assistant Professor this fall. This past June he received his Ph.D. from the University of Chicago; he earned an M.S. there in 1995



*Marcin Mazur*

and an earlier one from Warsaw University. While a student in Poland he was awarded a stipend from the Foundation for Polish Science and a scholarship from the Ministry of Education and became a teaching assistant and coach of the Polish National Teams for IMO. He has been a lecturer at University of Chicago and has participated in workshops in arithmetic geometry, algebraic geometry,

and group theory in Egypt, Italy and France.

**Wai Yan Pong** is also a new J.L. Doob Assistant Professor. His research interests are in model theory, particularly in the model theory of fields, differential algebra, and algebraic geometry. He was awarded his Ph.D. from the University of Illinois at Chicago in May 1999. He received a B.Sc. from the Chinese



*Wai Yan Pong*

University of Hong Kong in 1993 and an M.Sc. from UIC in fall 1997, where he was awarded both a University Fellowship and a Sloan Dissertation Fellowship.

## Fossum Steps Down

**P**rofessor Robert Fossum, who retired from his position as secretary of the American Mathematical Society, was honored at the AMS Banquet held during the Joint Mathematics Meeting in San Antonio last winter. He was lauded for the time and hard work he put in during the ten years he was secretary. A speaker said, "he took charge, he took risks and he delivered."

This was a period of great change in the Society's traditional fiscal base of scholarly publishing, and a time when expectations rose about what the AMS should do for its members and for the broader mathematical community.

During the past ten years that saw the rise of electronic publishing and the world wide web, Fossum was deeply involved in a wide range of AMS activities. Among other duties, he handled appointments for the Society's more than 100 committees, oversaw the selection process for prizes, prepared agenda and minutes for the Council meetings, and served on the Notices Editorial Board.

## New Faculty, continued

Jerusalem where he learned English. He has been working in operator theory. One of his recent papers is on integral mappings and the principle of local reflexivity for non-commutative  $L^1$ -spaces.

*Then, my noble friend, geometry will draw the soul towards truth, and create the mind of philosophy, and raise up that which is now unhappily allowed to fall down.*

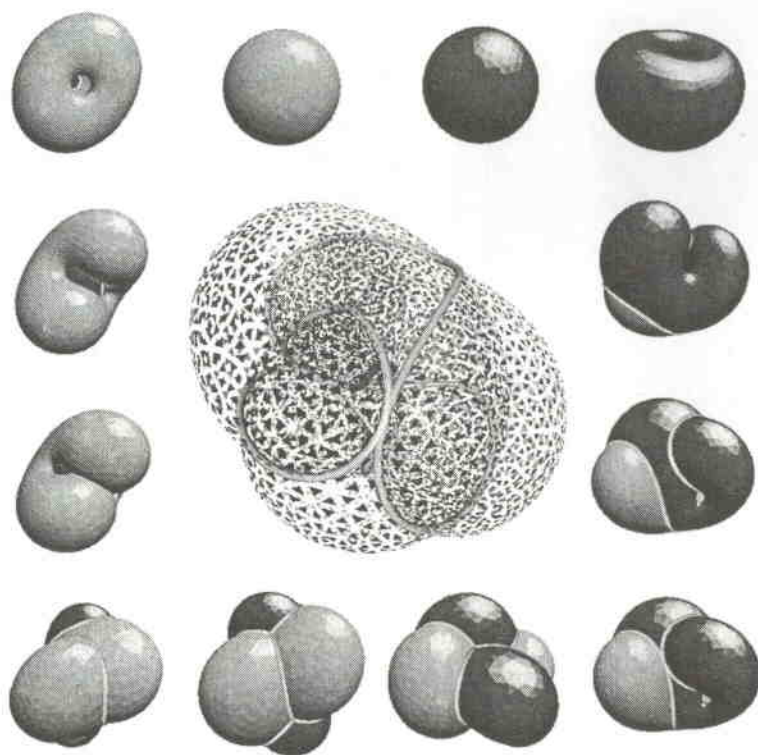
— Plato

## Sullivan's Optiverse

This past summer, John Sullivan was invited to present his mathematical video "The Optiverse," at two conferences on art and mathematics, one in San Sebastian, Spain, and the other in Kansas. "The Optiverse," a joint project with George Francis, Mathematics, and Stuart Levy of NCSA, premiered in 1998 at the ICM in Berlin and at SIGGRAPH in Orlando. It depicts the minimax sphere eversion, a geometrically optimal way to turn a sphere inside out, allowing it to pass through itself, but without ripping or pinching.

Sullivan has often made use of mathematical visualization in his research, creating computer simulations and graphics to study intricate geometric shapes and to suggest theorems to be proven. He has found that it is often possible to present these visualizations in a way that brings out artistic beauty as well as mathematical beauty.

This summer, Sullivan and Francis produced some high-quality prints of images from "The Optiverse" and other visualizations. NSF Mathematics Division Director Philippe Tondeur (see page 11) has had several of these prints sent to Washington, DC, where they are now on the walls of his office, showing people the beauty and complexity of mathematics.

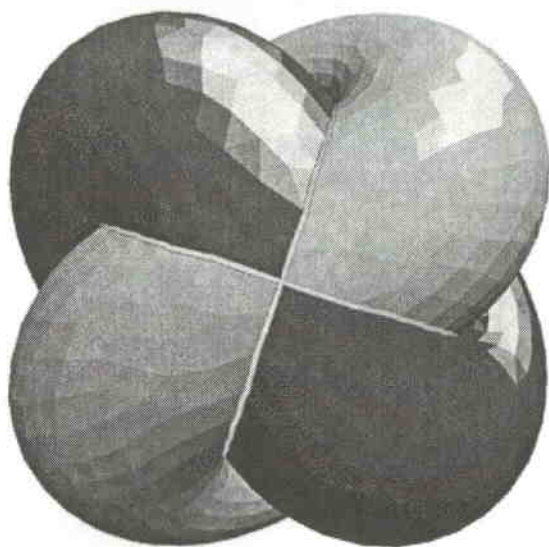


This minimax sphere eversion from "The Optiverse" turns a sphere inside out with the least possible bending energy. We start at the top with a round sphere, and proceed clockwise. Down the right-hand side we see the creation first of two double-curves, and then of a pair of triple points. (Another pair is created at the same time in back; the eversion always has two-fold rotational symmetry.) Across the bottom, we go through the halfway-model, interchanging the roles of the dark and light sides of the surface. Up the left column, we see the double-curves disappear one after the other. In the center, we examine the double locus just when pairs of triple points are being created, by shrinking each triangle of the surface to a quarter of its normal size.

*The reasoning of mathematicians is founded on certain and infallible principles. Every word they use conveys a determinate idea, and by accurate definitions that excite the same ideas in the mind of the reader that were in the mind of the writer ... and from these plain, simple principles they have raised most astonishing speculations, and proved the extent of the human mind to be more spacious and capacious than any other science.*

—John Adams





These are the halfway-models for the first two minimax sphere eversions. The Boy's surface (top), an immersed projective plane with three-fold symmetry and a single triple point, minimizes Willmore's elastic bending energy. The figure actually shows an immersed sphere, double covering Boy's surface, with the two (oppositely-oriented) sheets pulled apart slightly. The Morin surface shown (bottom) also minimizes Willmore energy; it has a four-fold rotational symmetry which reverses orientation, exchanging the lighter and darker sides of the surface.

## Fellowships Awarded

The Department of Mathematics has three sources of fellowship funds: GAANN fellowships from the Department of Education (which are restricted to U.S. citizens), University fellowships from the UIUC Graduate College, and Named fellowships that are established by family, students and friends of former faculty members in mathematics which include: the Waldemar J., Barbara G., and Juliette Alexandra Trjitzinsky Memorial Fund; the UIF Bourgin Fund; the UIF Schark Graduate Student Aid Fund; the UIF J.D. Hogan Scholarship Fund; and the UIF E.T. Parker Memorial Fund (which provides summer fellowships). This year's fellowship recipients are:

### ◆GAANN

New students: Jim Brown, Daniel Cranston, John Maki, Joseph Milet, and Jennifer Paulhus  
Continuing students: Mark Bauer, Kristine Baxter, Jerry Gagelman, Douglas Kuhlman, Andrew Mauer-Oats, Kevin O'Bryant, Benjamin Richert, and Christopher Willett

### ◆University Fellows

Edith Adan-Bante, Michael Bush, Ciprian Demeter, Donghoon Hyeon, Katarina Jegdic, Anoush Najarian, and Jiyeon Suh

### ◆Trjitzinsky Fellows

Linda Lawton, Xiaosheng Li, James McLaughlin, and Vahagn Minasian

### ◆Bourgin Fellow

Jennifer Steichen

### ◆Schark Fellow

Hui Li and Magdalena Musat

### ◆Hogan Fellow

Dominika Polkowska (her fellowship is one-third funding each from Bourgin, Schark, and Hogan funds)

### ◆Parker Summer Fellows

Madhav Chandrasekher, Thomas Kuhnt, and Alison Miller

**P**rofessor Emeritus **Heini Halberstam**, former head of the department, gave a colloquium talk at the University of York, England, last November. In July he gave an invited lecture on "Erdos and Brun's Sieve" at the international conference *Paul Erdos and his Mathematics* in Budapest, Hungary. The text will be published in a proceedings volume. Professor Halberstam will speak at a conference at Nottingham University, England in early February 2000 in honor of the 65th birthday of D. A. Burgess.

In May **Anand Pillay** gave an invited talk at the Quebec Graduate Student Colloquium at UQAM and also an invited talk at the Model Theory of Valued Fields meeting in Edinburgh. In June he gave an invited talk at the Model Theory Day meeting at Universite Paris VII. He spent two weeks in Paris in June as part of the official UIUC-CNRS collaboration agreement and in August was in Utrecht to give a

tutorial on "Geometric Model Theory" at the Association of Symbolic Logic Annual European Meeting.

**Esther Portnoy** gave a paper, "The Puzzle of Human Aging and Longevity", at the Actuarial Research Conference in Des Moines, Iowa, August 10. She is serving on a task force to oversee preparation of new mortality tables for insurance purposes, requested by the National Association of Insurance Commissioners.

During May and June **Derek Robinson** visited the University of Warwick under a grant from the U.K. Engineering and Physical Sciences Research Council. While in England he lectured at the University of Birmingham.

**Doug West** was a co-organizer of a conference *Kleitman and Combinatorics: A Celebration* in honor of Kleitman's 65th birthday. This was held August 16-18 at MIT.

**Graham Evans** gave a talk at a conference in Oberwolfach on commutative ring theory and algebraic geometry. He was at Oberwolfach during the solar eclipse and in the path but missed seeing it as it was raining at the time. Evans also spoke at the University of Osnabruck on algebraic geometry.

Emeritus Professor **Peter Braunfeld** gave two invited lectures in Europe about what is going on in mathematics education in the United States. He spoke at the University of Giessen in Germany and the University of Klagenfurt in Austria. To make the talks accessible not only to university faculty but to local school teachers, Braunfeld gave the talks in German.

**Richard Laugesen** has been awarded a fellowship in the Center for Advanced Study here on campus, tenable in Spring 2000, during which time he will concentrate on research in nonlinear partial differential equations. In July, Laugesen spoke at a conference on "The Dynamics of Thin Fluid Films" in Edinburgh, during what was a spell of unusually hot weather for Scotland (75 degrees or so).

On **Bruce Reznick's** web page ([www.math.uiuc.edu/~reznick](http://www.math.uiuc.edu/~reznick)) he has posted his "Resources for Research (an always preliminary list)" and also the third edition of "Chalking It Up: Advice to a New T.A." Both are very useful for graduate students.

**Nigel Boston** has been appointed to CSL and the Beckman Institute, where he now has offices. In April, he spoke at Harvard.

*What science can there be  
more noble, more excellent,  
more useful for men, more  
admirably high and  
demonstrative, than this of  
mathematics?*

—Benjamin Franklin



## Special Year in Number Theory 1999-2000

The department is sponsoring a Special Year in Number Theory 1999/2000, ending in a major international meeting here May 21-26, 2000, "The Millennial Conference on Number Theory." At this conference, 18 plenary lectures will be delivered by leading international experts, complemented by about 100 shorter talks. The major achievements in number theory during the century will be reviewed and some directions for number theory in the next century will be discussed.

The conference will honor **Emeritus Professor P. T. Bateman**, who recently celebrated his 80th birthday. Professor Bateman, department head for 15 years, did more than anyone else to build the UIUC department into one of the world's leading centers in number theory. In recent evaluations of U.S. graduate programs, the UIUC number theory program was ranked fourth in the country.



*Paul T. Bateman*

Number theorists who will be on campus for at least a semester during the special year include visiting professors Robert Tichy of the Technische Universität in Graz, Austria, and Helmut Koch of Humbolt University in Berlin; visiting scholars Mary Armon of Knox College, James Carter of the College of Charleston, Anupam Srivastav of SUNY at Albany, Jeff Thunder of Northern Illinois University, and Wen-Bin Zhang of the University of the West Indies, Jamaica. There will also be many short term visitors.

The Arithmetic, Geometry, and Cryptography Workshop, in November, will bring together academic and industrial experts with basic mathematical backgrounds in group theory and number theory to discuss the role that mathematics plays in modern cryptography. Featured speakers are Neal Koblitz, Joe Silverman and Nigel Smart. **Nigel Boston**, Mathematics, and Richard Blahut, Electrical and Computer Engineering, are the organizers.

Also in November a workshop on number theory and model theory is being organized by **Alexander Buium** and **Anand Pillay**. In May, before the Millennial Conference, a workshop on the interface of number theory and probability is being organized by **A.J. Hildebrand** and **Walter Philipp**, and after the conference **Michael Bennett** is organizing a workshop on

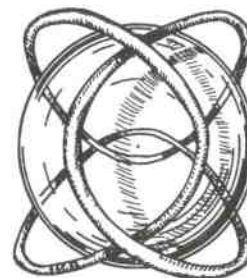
topics in transcendence and diophantine approximation.

In the spring, there will also be a conference by and for graduate students, and in the summer a camp for undergraduates, and a two-week instructional conference on algebraic number theory related to Fermat's Last Theorem. In the fall, a small conference on  $q$ -series, theta-functions, and partitions will be held.

The proceedings of the Millennial Conference will be published. Principal organizers of the conference are department faculty members **Bruce Berndt**, chair, **Nigel Boston**, **Harold Diamond**, **A.J. Hildebrand**, and **Walter Philipp** of Statistics. They are being assisted by **Betsy Gillies**, conference coordinator.

Grant support has been provided by the NSF, the Number Theory Foundation, the National Security Agency, the Institute for Mathematics and its Applications, The University of Illinois, the College of Liberal Arts and Sciences and the Department of Mathematics. For additional information see the website at:

[www.math.uiuc.edu/nt2000](http://www.math.uiuc.edu/nt2000).



## Retirements

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A retirement reception was held May 2 at Levis Faculty Center to honor four faculty members, **Earl Berkson**, **Mary-Elizabeth Hamstrom**, **Elliot Weinberg** and **John Wetzel** and for **Joann Hower**, assistant to the chair.

**Professor Berkson** received his Ph.D. from the University of Chicago in 1960 where he was funded by a National Science Foundation post-graduate fellowship. After receiving his Ph.D. he was an assistant professor at the University of California, first at Los Angeles, later at Berkeley, before coming to the University of Illinois in 1966. He became a professor in 1973. He has been a Research Council Visiting Fellow in Edinburgh and Glasgow, Scotland, and a visiting professor in France at the University of Paris and the Institut des Hautes Etudes Scientifiques, as well as an associate at the UIUC Center for Advanced Study.

Among his other professional services, Berkson served two terms as editor of the Illinois Journal of Mathematics and two terms as associate editor of the Journal of Geometric Analysis. He has given many invited talks at colloquia and conferences, in the United States, Europe, and Israel. His recent publications have been on Fourier analysis for operators.

**Professor Mary-Elizabeth Hamstrom**, received her B.A.

degree from the University of Pennsylvania in 1948 and her Ph.D. from the University of Texas in 1952, where she served as a special instructor. In 1952 she went to Goucher College and in 1956-57 to the Institute for Advanced Study in Princeton. In 1961 she joined the University of Illinois as an associate professor and became a professor in 1966.

She has been a visiting faculty member at the University of Warwick, England, and a visiting professor at the University of North Carolina. Her many publications have focused on her principal mathematical interest — geometric topology, in particular, spaces of homomorphisms of manifolds.

**Elliot Weinberg** who received both his bachelor's and his Ph.D. from Purdue University, joined the UIUC mathematics department in the fall of 1960. His dissertation, identities of lattices in continuous functions, served as a starting point for his publications in ordered algebraic structures. He visited Padua University in Italy, supported by a grant from the Italian government, spent a year at the University of Bonn and two half sabbaticals at Hebrew University in Jerusalem.

Since 1987 Professor Weinberg has been the director of undergraduate programs for the department and put into effect many innovations. One of the most important has been strengthening the teacher educa-

tion program. He has been active in curriculum development, serving on committees in the department, the college, and the Council of Teacher Education.

**Professor Wetzel** was awarded his Ph.D. in 1964 from Stanford University at which time he became an assistant professor at UIUC. His graduate work at Stanford was in complex analysis and his dissertation concerned compactification of open Riemann surfaces. In recent years Wetzel has been interested in classical combinatorial geometry. Among his publications are papers on dissection problems, curve-covering problems, and on various aspects of the theory of arrangements in Euclidean and projective spaces, including simplicial arrangements associated with regular polytopes in real projective  $d$ -space. He has resurrected the Geometric Potpourri Seminar at which colleagues from nearby universities and from our department speak of their latest research and then join in the popular Geometers' Lunch.

**Joann Hower** has been with the department since 1982 and has served with one department head and three chairs. Last year she was awarded the LAS Academic Professional Award, a prize which honors individuals who have made outstanding contributions to the college.

## Tondeur Goes to NSF

In July, shortly before he moved from Urbana to become the National Science Foundation's Director of the Division of Mathematical Sciences in Washington, DC, Professor Philippe Tondeur, chair of the department for the past three years, spoke about what he saw as the work of NSF's mathematics division.

At NSF, he says, his agenda for the mathematical sciences will not be terribly different from being the chair of a first class mathematics department. The NSF's mathematical division works to promote the discovery, integration, dissemination, and employment of new mathematical knowledge, and to do this through excellent education at all levels.

Mathematicians play an essential role in serving society, he feels. Mathematics is both an intellectual endeavor and the foundation of other disciplines, a gateway, necessary for science, engineering, economics. To show the strengths of mathematics, Tondeur wants to encourage mathematicians to interact with users of math from other areas, to connect with men and women in other sciences.

As mathematics is so important for the economic well being of the nation, mathematics must remain healthy. This requires investing in people, he says, which means supporting top research mathematicians, as well as graduate students and postdocs, by seeing to it that they are paid enough so that mathematics is an attractive field, and they are not lured away from mathematical research.


Full time graduate students in mathematics should receive support comparable to what graduate students in other sciences receive. Tondeur will still be working for the welfare of faculty and students. What will be different in his new position is the support he will have to mobilize in order to keep the discipline vital so that it remains an attractive profession. He will work to gain the support of a large array of decision makers, including administrators, politicians, congressmen and the Office of Management and Budget. Working with him at NSF are 20 program directors, all research mathematicians with support staff, heading such areas as algebra and analysis, each trying to promote the welfare of their specialties. Professor Tondeur sees the task facing him as exciting and challenging, and of great interest for someone who thinks mathematics is one of the greatest manifestations of the human spirit.

*Mathematics stands forth as that which unites, mediates between man and nature, inner and outer world, thought and perception, as no other subject does.*

—Froebel

## Library Funding

The **Mathematics Library** is hurting! Our wonderful library, ranked third worldwide in an American Mathematical Society study, is facing an uncertain future in its ability to offer the collections and services mathematicians need to keep abreast of research developments. Inadequate state funding and double digit price increases are the cause of much of the misery. The cost of our journal subscriptions has risen on an average of 9.2% in the last 5 years while the allocation has risen only 5%.



**For your convenience, a contribution form and envelope are enclosed in this newsletter.**

Did you know that last year the average cost of a mathematics book was \$85? That the average cost of a mathematics journal was \$740? It was only a decade ago when we were able to use funds from "library friends" to buy the extras which made us such a unique research library. But this year we must consider cancelling \$11,000 worth of journals needed for research just to bring our projected expenditures in line with our budget. Our only other option is to come to you for support.



## Kuwait Mathematics Ph.D. Program Reviewed

In February **John Gray** was invited to Kuwait University by the authorities who wanted to consult him about their plans to establish a Ph.D. program in mathematics. Kuwait has a rule that before a new program is established two outside authorities have to be consulted. The Associate Dean reviewed different graduate program websites and found the UIUC the most informative and, because of that, invited Professor Gray.

While there he talked to faculty and students and then wrote a report. He found Kuwait interesting and said that it is farther along in establishing a Ph.D. program than other countries in that area.

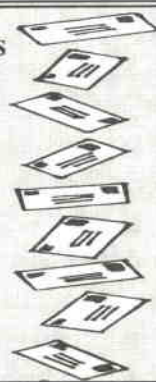
While there is some thought to limiting the program to Kuwaiti citizens, Professor Gray told the authorities that if they establish a Ph.D. program they will need students from other countries in addition to those from Kuwait. The mathematics

faculty there is only 10 percent Kuwaiti. It includes one American and several Eastern Europeans; the main person Gray talked to was from India.

The students he met who were prospective Ph.D. students were nearly all women. Many Kuwaiti men go abroad to study mathematics, but a woman cannot leave Kuwait unless she is accompanied by a male relative.

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