VAN VLECK NOTES

Department of Mathematics ✳ University of Wisconsin - Madison ✳ Fall 1996

http://www.math.wisc.edu

From the Editor ...

The 1996-97 academic year opened with a remarkable, not-to-be-believed social event. On September 28 in Tripp Commons of the Memorial Union, the Mathematics Department had its first annual (well, that remains to be seen!) CONTRADANCE. With music provided by Mike Briggs on piano, Joe Laurence on fiddle, Barbara Laurence on guitar, and the incomparable Norma Briggs as teacher and caller, the evening will remain a memorable one for those who were game enough to participate. Contradances, line dances, square dances, polkas, waltzes, you name it and we were doing it. Because of my personal experience with how well mathematics and social work go together, the faculty of the School of Social Work was also invited.

There was essentially full participation in every dance and according to Norma Briggs (who plays at dances regularly with her group) this was very unusual; she never saw such a lively and willing group and she was very impressed. As Rod Smart said to me the Monday after the dance (and after I had badgered the faculty for several weeks to sign up), "almost everyone came to the dance to please me and almost everyone had a good time." (I must admit that I did a clever thing. Rather than distributing the announcements in mailboxes, as is usually done for things of this sort, I mailed them to homes so that they wouldn't possibly end up in the 'circular file' and escape the notice of spouses.) Rumor has it that one of the social work participants (no it wasn't my wife) told her faculty, in a meeting of their Executive Committee no less, that the Math Department really knows how to socialize and have a good time and they could learn a lot from them.

The all-star cast (from the Math Department) consisted of: Walter and Mary Ellen Rudin, Hans and Miriam Schneider, Don and Mary Crowe, Steffen and Brenda Lempp, Bob and Rosine Turner, Carl deBoor, Joel Robbin, Diane Mutz, Ken and Anne Kunen, Arnie and Man Li Miller, Peter and Artie Orlik, Dan and Gail Shea, Rod and Pat Smart, Mike and Jane Voichick, Dottie and Ed Churchwell, Howard and Shirley Conner, Seymour and Ruth Parter, Melinda and Phil Certain, Terry and Susan Millar, Marshall and Sonia Slemrod, David and Maria Fremlin, Louis and Elsbeth Solomon, Paul Terwilliger, and yours truly and my wife Mona.

At the beginning, when everyone was still trying to tell their left foot from their right foot and were still bumping into one another, there was a little 'accident' with a few people falling on one another. Mary Ellen Rudin felt some pain for the remainder of the evening, but not to be intimidated, kept on dancing. The next day she discovered that she had fractured a couple of ribs. Not wanting me to think that dances in the Math Department maybe should be discontinued or that we might have to qualify them with the Dance General's warning "Dancing may be dangerous to your physical health," Mary Ellen later told me that "the Math Department has eaten together for many years and we do need to do something physical together." I believe that Mary Ellen would have come to a dance the following weekend, fractured ribs and all!

Our newsletter now has a new look and is packed with more information that we hope you will find interesting. Let us know how you like it. (RAB)

Coming Attractions...

ANNUAL WISCONSIN REUNION IN SAN DIEGO

The Seventh Annual Reunion of Wisconsin Alumni and Friends will take place at the annual AMS and MAA meetings in San Diego on Friday, January 10 from 5 to 7 p.m. The location will be the CARDIFF Room in the San Diego Marriot and Marina. As in the past there will be hors d'oeuvres, a cash bar, and lots of good talk. As usual we are requesting a contribution of $5 to help defray the costs. See you in San Diego!

PhD CENTENNIAL CONFERENCE

The big news this year is the Centennial Conference. On May 22-24, 1997 the Department of Mathematics of the University of Wisconsin - Madison will celebrate the 100th anniversary of the awarding of the first PhD in Mathematics by the University of Wisconsin in 1897. All current and former Wisconsin faculty, students, visitors, fellows, and other 'Wisconsin friends' are cordially invited to participate in the conference. A flyer on the conference was mailed recently to everyone on our mailing list. If you didn't get one and are interested, let us know and we will mail you one.

Our first PhD was awarded to Henry Freeman Stecker whose dissertation was entitled "On the roots of equations, particularly the imaginary roots of numerical equations." After a brief stay at Cornell University, Dr. Stecker joined the faculty of the Pennsylvania State University where he remained until his death on October 29, 1923. The second PhD in Mathematics went to Theodore Running in 1899 with a thesis entitled "On systems of circles derived from three and four base circles." The third was awarded to Charlotte Elvira Pengra in 1901 with thesis title "On the conformal representation of plane curves, particularly for cases p=4, 5, and 6." The next PhD, not awarded until 1907, went to Florence Eliza Allen whose thesis was entitled "The cycle involutions of third order determined by nets of curves of deficiency 0, 1, and 2." Dr. Allen's thesis advisor was

Edward Burr Van Vleck after whom the Mathematics Building at Wisconsin is named. It is perhaps surprising that half (2 out of 4) of the PhDs in Mathematics in the first ten years (1897-1907) were awarded to women.

Invited speakers, who are being asked to discuss early work at Wisconsin and more recent work of former and current Wisconsin students and faculty, include: Richard Arratia, Richard Askey, Carl de Boor, Robert Brown, Joshua Chover, Michael Crandall, George Glauberman, William Jaco, Yiannis Moschavakis, John Nohel, Louis Solomon, and Walter Rudin. A banquet/ celebration evening will be held on Friday, May 23, 1997 in Great Hall of the Memorial Union. Mary Ellen Rudin will be the banquet speaker. Other participants will offer reminiscences. Many mini-symposia are being organized by former Wisconsin students with the advice and help of a current UW faculty member. There will be a reception to welcome all participants on Wednesday evening, May 21, 1997 from 7:30 to 9:30 pm in the ninth floor conference room of Van Vleck Hall.

A preliminary program will be mailed in March of 1997 to all those who have expressed interest in participating in the conference.

Comings and Goings...

There have been considerable change in the administrative & supervisory staff in the department. Marshall Osborn has been the Associate Chair since the fall of 1995. Dan Rider stepped down as TA Coordinator this past year and that position is now held by Dietrich Uhlenbrock. You may recall that Dietrich was Associate Chair before his sabbatical in 1995-96. Dan Rider is enjoying a sabbatical this semester. With Mike Voichick's retirement, Dan Shea is now the new Undergraduate Coordinator. Bob Turner is the new Graduate Coordinator, having taken over from David Griffeath who is on sabbatical this year. Each of these people is facing new challenges with their assignments, but physical and creative energy abounds and they are off and running.

Marshall Slemrod is now the Director of the Center for Mathematical Sciences. Marshall has taken over from Tom Kurtz who is on sabbatical this year.

In continuing assignments, Alex Nagel is Associate Dean for Natural Sciences in the College of Letters and Science, and Terry Millar is Associate Dean for the Physical Sciences in the Graduate School. Terry is also Acting co-Director of the NSF-sponsored National Institute for Science Education on campus. (So Terry now holds two half-time positions, and even though we are mathematicians we all know that in cases like this 1/2 + 1/2 does not equal 1.) Richard Brualdi continues as Chair of the Department for a fourth year.

NEW FACULTY

Although we didn't hire any tenure-track or tenured faculty this past year, **Yongbin Ruan**, who was hired as a new Associate Professor in the preceding year, joined us here in Madison for the first time this year. Yongbin's field of interests are symplectic topology and mathematical physics. He was awarded a Sloan Fellowship for the years 1995-97. A description of some of Yongbin's research is contained in last year's newsletter.

We have two new Van Vleck Visiting Assistant Professors this year. They are **David Moulton** and **Jiye (Jay) Yu**. David

received a PhD from the University of California - Berkeley in 1995. His thesis "Number theory and groups" was written under the supervision of Professor Hedrick Lenstra. As the title indicates, David is interested in number theory and groups, but he also has interests in combinatorics and graph theory, and is a regular participant in the Combinatorics seminar. As a graduate student at Berkeley, he did volunteer work to improve the teaching of science in San Francisco public schools.

Jay received a PhD from Washington University (St. Louis) in 1993. His research interests are in complex analysis and geometry in several variables. His thesis was written under the supervision of Professor Steven Krantz and was titled "Geometric analysis on weakly pseudoconvex domains. Jay spent three years as a Visiting Assistant Professor at Texas A&M University before coming to Madison.

Also **Mariko Arisawa** is a new Research Associate working with Takis Souganidis. Mariko received a PhD in 1996 from CEREMADE Universite de Paris - Dauphine. Her thesis "Ergodic problem for the Hamilton-Jacobi-Bellman equation" was written under the supervision of frequent Madison visitor (and Fields medalist) Professor Pierre-Louis Lions. Mariko lists her research interests as partial differential equations and control & dynamical systems. In 1997-98 Mariko will be a Van Vleck Visiting Assistant Professor.

We are excited about the new knowledge, ideas and energy that our new Van Vlecks and Research Associates bring to the department. With the continuing Van Vlecks, **Mirna Dzamonja, Dikran Karagueuzian** (also an NSF postdoc), and **Gloria Mari-Beffa**, and Research Associate **Tom Roby**, we have a wonderfully talented and vibrant group of young people in the department.

VISITING FACULTY

We have several distinguished visiting teaching faculty this year.

John V. Baxley is visiting this semester from Wake Forest University and is working with R. Wayne Dickey on problems in applied mathematics. John received a PhD from UW-Madison in 1966. His thesis

"Asymptotic behavior of the eigenvalues of generalized Toeplitz matrices associated with Jacobi polynomials" was written under the direction of Seymour Parter. After leaving Madison, John spent two years at Duke University before going to Wake Forest. We are happy that John's sabbatical from Wake Forest and our need for visitors came together this year. He hadn't been back to Madison since 1975 and as he wrote "It is almost like coming home." Well, welcome home, John!

Sergey V. Bolotin is also visiting this semester from Lomonosov Moscow State University and is working with Paul Rabinowitz on dynamical systems. Sergey received a PhD in 1982 from Moscow State University and his thesis was entitled "Libration orbits of reversible Hamiltonian systems." He was an invited lecturer (section on ordinary differential equations and dynamical systems) at the International Congress of Mathematicians in Zurich in 1994.

In the spring semester (of course, here in Madison, most of the spring semester takes place in winter) , we will see the arrival of three more visitors.

Mehrdad Shahshahani received a PhD from the University of California - Berkeley in 1970. He has an eclectic background having held positions at Harvard, Brandeis, Stanford, Virginia, Berkeley, Boeing Aerospace, and the Jet Propulsion Laboratory in California. His research interests include probability, symmetric spaces, and image and data compression.

Songmu Zheng received a PhD in 1965 from Fudan University and is currently a faculty member of that university. His research interests are nonlinear PDE with applications to physics, mechanics and biology, and infinite-dimensional dynamical systems. He previously was a visitor at Purdue University, University of Minnesota, and University of Utah. Songmu is a collaborator of Marshall Slemrod.

Ian Dinwoodie from Tulane University received a PhD from Northwestern University in 1990. His thesis "Large deviations of censored data" was written under the supervision of Professor S.L. Zabell. Ian is a collaborator of Peter Ney.

HONORARY FELLOWS

Madison continues to attract a large number of talented mathematicians who want to come to work with our faculty as Honorary Fellows. Appointed Honorary Fellows this year, with their home institution and sponsoring faculty member, are:

- Erik Anderson, Lund Institute of Technology, Sweden (Franc Forstneric)
- Maxim Burke, University of Prince Edward Island, Canada (Arnold Miller)
- David Fremlin, University of Essex, England (Arnold Miller)
- Olle Haggstrom, Chalmers University of Technology, Sweden (Robin Pemantle)
- Jose Maria Perez Izquierdo, University of Zaragoza, Spain (Georgia Benkart)
- Renling Jin, University of Illinois (H. Jerome Keisler)
- Thomas Keller, Ohio University (I. Martin Isaacs)
- Anmin Li, Sichuan University (Yongbin Ruan)
- Yiming Long, Nankai University, China (Yongbin Ruan)
- Arlene Pascasio, De La Salle University, Phillipines, (Paul Terwilliger)
- Andrea Previtali, University of Padua, Italy (Martin Isaacs)
- Jeffrey Steif, Chalmers University of Technology, Sweden (Robin Pemantle)
- Kenichiro Tanabe, Kyushu University, Japan (Paul Terwilliger)
- Moon-Ok Wang, Hanyang University, Korea (Donald Passman)
- Kaiming Zhao, Institute of System Science, Academia Sinica, China (Marshall Osborn).

SABBATICALS AND LEAVES

Six faculty members are on sabbatical leave during all or part of this academic year. Georgia Benkart has a year-long sabbatical and is spending the first part at the Institute for Advanced Study (Princeton) and the second part at the Mathematical Sciences Research Institute (Berkeley). Tom Kurtz also has a year-long sabbatical and is making extended visits to the institutions of many of his collaborators around the world, including the Australian National University, the University of London, the University of Strasbourg, Stanford University, and the University of Utah. David Griffeath is based in Madison for his year-long sabbatical but is taking extended visits to work with collaborators at Cornell University, MIT, Princeton University, UC-Davis, and Woodshole. Anthanasios Tzavaras is spending his year-long sabbatical at the Ecole Polytechnique and the Laboratoire d'Analyse Numerique in Paris. After five years as TA Supervisor, Dan Rider is on sabbatical in the fall semester and is stationed in Madison. Jim Kuelbs has a spring semester sabbatical, and will be working with collaborators at Indiana University and the University of Delaware, and in France.

Other faculty members are currently on leave. Maury Bramson and Claudia Neuhauser are on leave this year at the University of Minnesota. Hiroaki Terao is also on leave for the whole year at Hokkaido University in Sapporo, Japan. Larry Levy is on leave in the fall semester and is devoting his efforts to his research and writing. In the spring semester, Anatole Beck will be on leave at the London School of Economics.

RETIREMENTS

Another big news item is that this past year, eight long time faculty retired from full-time service at UW-Madison. They are, with the year they joined the Mathematics Department in parenthesis: Mike Bleicher (1962), Fred Brauer (1960), Simon Hellerstein (1963), Peter Ney (1965), Seymour Parter (1963), Mei-Chang Shen (1965) Louis Solomon (1969), and Michael Voichick (1964). Each of them has a post-retirement teaching agreement that will keep them teaching in the department for several years. Seymour Parter has a three year agreement to teach one course in mathematics and one in computer science for three years. Michael Voichick chose a four year agreement to teach one course each year for the four years beginning with the 1997-98 academic year. The six others each have agreements to teach two courses each year for the next five years. All the retirees have been awarded emeritus status at UW-Madison.

In addition, Jake Levin (1963) is retiring at the end of the fall semester of the current academic year, and the department has voted to award Jake emeritus status. Rod Smart (1962) has already let it be known that he will retire at the end of the current academic year. He has already arranged post-retirement teaching for four years, teaching two courses per year.

Post-retirement teaching is a relatively new program of the College of Letters and Science that is need-driven. There are advantages all around: it allows a faculty member a transition into (full) retirement and it allows the department and college to retain the services of experienced faculty members on a part-time basis.

Dedications, Honors, and Awards...

MARK H. INGRAHAM HALL DEDICATED

A dedication ceremony was held on October 25, 1996 to rename the Commerce Building as the Mark H. Ingraham Hall. The Commerce Building, located directly northwest of the tower of Van Vleck Hall, was built in the mid-1950s and housed the School of Business from 1955 to 1993.

Mark Hoyt Ingraham was born in Brooklyn in 1896 and first came to the University of Wisconsin in 1919 as an instructor in Mathematics. He earned an M.S. in Mathematics from Wisconsin in 1922 and a PhD from the University of Chicago in 1924. He was appointed a Professor of Mathematics at the University of Wisconsin in 1927 and was a member of the faculty until his retirement in 1966. Ingraham's research interests were primarily in matrices and linear algebra and he published a number of mathematical papers. He supervised 17 Ph.D. students and in 1930 established at Wisconsin the first academic computing center in the United States. Professor Ingraham was chair of the Department of Mathematics from 1932 to 1942. Ingraham became the third dean of the College of Letters and Science in 1942 and served in that capacity until 1961. He died at the age of 86 on November 14, 1982. He was recognized as a national expert on teachers retirement issues. In 1973 the University of Wisconsin made a rare exception and awarded one of its own an honorary degree.

The dedication ceremony was a very moving and interesting event. There were remarks by the current Dean of L&S, Phillip R. Certain, Provost John Wiley, Dean David M. Trubeck of International Studies and Programs, and former L&S Dean David Cronon. A highlight were remarks by Mark Ingraham's son Edward Ingraham, who is Professor of Mathematics at Michigan State University. One of the quotes of Mark Ingraham read at the ceremony was this particularly poignant one on his regrets: " I would have liked to be a better dean, a better mathematician, but this is not my poignant regret. I greatly wish I had drunk deeper from the font of literature - both English, and those treasures kept from me by the bolted gates of language. I wish I had an ear for music. I wish I could have traveled to more lands, studied their monuments of art, seen rhododendrons in bloom in the Himalayas. But let me be candid. There are lots of things of which I am not proud - but I AM proud of my list of regrets."

Ingraham Hall has been designated as a home for interdisciplinary and international programs associated with L&S and the Office of International Studies and Programs.

TOM KURTZ IS NAMED PAUL LEVY PROFESSOR OF MATHEMATICS AND STATISTICS

Thomas Gordon Kurtz has been awarded a WARF-University Houses Professorship by the Graduate School and has chosen to identify the professorship as the Paul Levy Professorship of Mathematics and Statistics. Tom received his PhD from Stanford University in 1967 and joined our Department in the fall of that year. He received a joint appointment in the Department of Statistics in 1985. He served as Chair of the Department of Mathematics from 1985 to 1988 and was Director of the Center for the Mathematical Sciences from 1990 to 1996. Tom has also served on many Letters & Science and Campus committees and was the Chair of the important University Committee. At the national and international level, he has been chair of the NSF Mathematical Sciences Advisory Committee and has served on numerous professional society boards. The award is supported by $75,000 in flexible research funds.

Tom Kurtz is an internationally recognized expert on Markov processes, stochastic analysis, and related approximation problems. He is in great demand as a lecturer and has lectured in more than 15 foreign countries (that number has likely increased this year while Tom is on a well-deserved sabbatical). The author of two books and more than 70 research papers, Tom has had more than 15 PhD students. His book "Markov Processes: Characterization and Convergence" with Wisconsin native and former PhD student Stewart Ethier has become a standard reference in the advanced theory of Markov processes. In announcing this award, the Dean of the Graduate School Virginia Hinshaw congratulated the Departments of Mathematics and Statistics on having such an "outstanding faculty member." We couldn't agree more with Dean Hinshaw. Tom has been a very important member of our department, and indeed of the university, for nearly 30 years.

Tom chose the name Paul Levy (1886-1971) because Levy was one of the founders of the modern theory of probability. Born in Paris, he was the son and grandson of mathematicians. He was already an established mathematician when in 1919 he was asked to lecture on "the role of the Gaussian law in the theory of errors," a subject now well known to every student of elementary statistics. These lectures initiated an outpouring of work that not only helped place much of probability theory on rigorous foundations, but also defined many of the problems and research directions that engage probabilists today. Limit theorems, independent increment processes, martingales, Brownian motion are all ideas familiar to even casual observers of probability and critical to applications ranging from engineering to finance. Paul Levy played a central role in their formulation and development.

GEORGIA BENKART RECEIVES A WARF MID-CAREER AWARD

The WARF Mid-Career Award is a new award given by the Graduate School that is intended to recognize and support mid-career faculty at a critical stage of their careers. In only the second year of competition for this award, George Benkart was recognized for her "proven potential." The award "provides an opportunity for critical judgment by the winner on the best strategies for continued development of their outstanding research program." In announcing the award to the Department of Mathematics, Dean Hinshaw of the Graduate School said that "the University shares your pride in having such an outstanding faculty member." Indeed we are very proud of Georgia! The award is supported by $60,000 in flexible research funds.

Georgia received a PhD from Yale University in 1974 and her first appointment at Wisconsin was as C.C. MacDuffee Instructor. She quickly rose through the ranks becoming Professor of Mathematics in 1983. Georgia is a world authority in the theory of Lie Algebras

and her work uses a wide variety of techniques from algebra and combinatorics. She is in constant demand as a speaker, worldwide, at universities and conferences. In 1994 Georgia gave an invited AMS-MAA hour address at the annual AMS and MAA annual meeting in Cincinatti. This year she has given more than a dozen invited addresses. Georgia is an inspiring teacher and in 1987 received a UW-Madison Distinguished teaching award. Her former and current PhD students number sixteen.

SIGURD ANGENENT AND PANAGIOTIS (TAKIS) SOUGANIDIS WIN VILAS ASSOCIATE AWARDS

This past year saw the Graduate School extend their Vilas Associate Awards to the Division of Physical Sciences. The Department's two nominees, Sigurd Angenent and Takis Souganidis, were both named Vilas Associates. This highly competitive award is supported by two years of summer salary support and $10,000 in flexible research funds to further their research and scholarly activity. In announcing the award, Provost John Wiley said that "this recognition is clear evidence of the respect and confidence in your work felt by your colleagues."

Sigurd received a PhD from the University of Leiden in 1986, and came to Wisconsin in 1987 after spending a NATO postdoctoral year at the California Institute of Technology. He was quickly promoted and in 1994 he became Professor of Mathematics. His research interests lie in partial differential equations and dynamical systems. Among his major achievements is his highly original proof of the analyticity of the free boundary for the porous medium equations, thereby culminating a sustained effort by the main researchers in the field to settle this question. Sigurd was a Sloan Fellow in 1990-92 and an NSF-Presidential Young Investigator in 1990-95.

Takis received a PhD here in Madison in 1983 with a thesis written under the supervision of Mike Crandall (now at UC- Santa Barbara). He immediately joined the faculty of Brown University. In 1991 he was appointed Professor of Mathematics at Madison. His research interests are in nonlinear partial differential equations and nonlinear analysis. His recent fundamental work in the macroscopic behavior of interacting particle systems and the related partial differential equations has advanced this field in a dramatic way. Takis was a Sloan Fellow in 1989-91 and an NSF-Presidential Young Investigator in 1987-92. In 1994 he was honored by an invitation to address the International Congress of Mathematicians in Zurich.

Takis is also to be congratulated for receiving this year's "Science: Applied Mathematics Academic Prize" given by the Bodossaki Foundation (Athens, Greece). This prize is awarded for distinctive contributions to someone who is not over 40 years of age and who is of Greek nationality, parentage or descent. Takis was nominated for this prize for which there is strong competition by the Department.

STEVEN BAUMAN RECEIVES WISCONSIN-MAA AWARD

At the meeting at UW-Platteville in spring of this year, Steve Bauman received the 1995-96 Distinguished Teaching Award given by the Wisconsin section of the Mathematical Association of America. Steve received a PhD from the University of Illinois in 1962 with a thesis on finite groups. He came to Madison in 1964 and was promoted to Professor of Mathematics in 1976. For over thirty years Steve has been devoted to UW-Madison and its undergraduate and graduate students, and his contributions to education on this campus have been enormous. They have included an innovative summer program for new international TAs, a summer minority undergraduate research program in 1991-92, development (with others) of the Wisconsin Emerging Scholars Program, a Faculty Fellow in the Bradley Learning Community, chair of the campus Quantitative Assessment Committee, participant in the Chancellor's Mentor Program, and Fellow in the UW-Madison Teaching Academy. Steve has also served on many campus committees such as the L&S Appeals Committee, Faculty Rights and Responsibilities Committee, and the University Committee on Graduate Assistants. You now know why the chair, in his letter to the Wisconsin Section, wrote "That Steve has managed to do so well so many things and remain the creative, warm, energetic, compassionate person he is, I find remarkable. And that is what Steve is: a remarkable candidate for the MAA Award."

CARL DEBOOR IS JOHN VON NEUMANN LECTURE

Carl deBoor gave the prestigious John Von Neumann Lecture at the annual SIAM meeting in Kansas City (July 22-26, 1996). The title of his lecture was "Polynomial Interpretation." Piecewise polynomial interpolation is of crucial importance in computer aided geometric design, analysis and manufacturing (e.g. in the aircraft and automotive industries). In their early application two fundamental questions arose: (1) Is there a relatively easy way to control behavior where two polynomial pieces meet? and (2) How can the polynomial pieces between interpolation points be efficiently evaluated? In 1946 I.J. Schoenberg (who later became a faculty member of UW-Madison) introduced a basis for piecewise polynomials, the so-called B-splines. It was Carl who in 1972 described a recursion formula for the stable evaluation of B-splines (and so for the stable evaluation of piecewise polynomials). Carl's book "A practical guide to splines" (Springer-Verlag, 1978) created a "B-spline revolution in geometric design." For more details, see the article "B-splines and geometric design" written by Paul Davis in the June, 1996 issue of SIAM News.

Carl is a member of the National Academy of Engineering and is P.L. Chebyshev Professor of Mathematics and Computer Science and Steenbock Professor of the Mathematical Sciences.

RICHARD ASKEY IS MAA HEDRICK LECTURE

At the summer meetings of the American Mathematical Society and Mathematical Association of America in Seattle (August 10-12, 1996) Richard Askey was invited to give the Earle Raymond Hedrick Lectures. There were three expository lectures: (1) Some of the history of the binomial theorem and its extensions, (2) Refined counting and a noncommutative version of the binomial theorem (3) Integral analogues of the binomial theorem, orthogonal polynomials and education. Dick is well-known for his encyclopedic knowledge of mathematics and mathematics history, and for his efforts on improving K-12 education, and was recently featured in the article "Who is Dick Askey and why is he so upset about the Standards?" written by Susan Addington and Judy

Roitman (The Mathematics Teacher, vol. 89, November 1996, 626-627). He also gave a lecture at the New Jersey section of the MAA in November, 1996 on "Texts, Tests, and Articles."

Dick, who holds the John Bascom Professorship in Mathematics, was also recently named a fellow of the American Association for the Advancement of Science (AAAS), the world's largest federation of scientists. The award recognizes people for their efforts toward advancing science or fostering applications that are deemed scientifically or socially distinguished. Dick was recognized for his work on special functions and for his work on educationally reform efforts. This year 283 scientists were named fellows of the AAAS.

TWO NEW PRIZES ESTABLISHED

With a generous contribution from Creighton and Ellen Buck, the R. Creighton Buck Undergraduate Prize for Creativity in Mathematics has now been established. This prize will be awarded every year in which a worth candidate has been identified.

In connection with the Model Theory Conference held March 12-13, 1996 in honor of Jerry Keisler on the occasion of his 60th (see last year's newsletter), former students of Jerry have established the H. Jerome Keisler Prize for a Logic thesis written at the University of Wisconsin. The plan is to award this prize every few years. Jerry's 60th birthday was on December 3, 1996. Prior to the Logic Colloquium that day, he was surprised with a birthday cake and (alcohol-free!) champagne.

PROMOTIONS TO FULL PROFESSORS

Three members of the Department were promoted to Professor of Mathematics this past year. They are: **Alejandro Adem, Steffen Lempp, and Thanos Tzavaras.**

Alejandro, whose research interests are in algebraic topology (group cohomology), received a PhD from Princeton University in 1986. He was appointed an Assistant Professor at Wisconsin in 1989 after having been a Szego Assistant Professor at Stanford University for three years.

Steffen's research interests are in logic (computability theory), and he received a PhD in 1986 from the University of Chicago. He was a Gibbs Instructor at Yale University for two years and then came to Wisconsin in 1988 as an Assistant Professor.

Thanos is an applied mathematician who received a PhD from Brown University in 1985. After two years at Purdue University, he came to Wisconsin as a Van Vleck Visiting Assistant Professor in 1987. He was then appointed Assistant Professor in 1989.

$$ FUNDS AND CONTRIBUTIONS $$

We hope that you will consider giving to the Departmental General Fund at the UW Foundation, or one of the special funds also held at the Foundation. The special funds are: Wolfgang Wasow Memorial Lecture Fund, Stephen Cole Kleene Memorial Fund for Logic Students, Department of Mathematics - Elizabeth Hirschfelder Fund for Graduate Women in Mathematics, Chemistry & Physics, H. Jerome Keisler Prize for a Logic Thesis, R. Creighton Buck Undergraduate Prize for Creativity in Mathematics. If your employer matches contributions, then you are effectively doubling your contribution.

Donations can be earmarked for the Mathematics Department or one of the named funds and sent to:

UW Foundation, 1848 University Ave., Madison, WI 53705.

HONORARY DEGREE TO ETTA FALCONER

Professor Etta Falconer of Spelman College was awarded an honorary degree at commencement exercises on May 17, 1996. Professor Falconer received a B.S. degree from Fisk University in 1953, an M.S. degree in Mathematics from the University of Wisconsin-Madison in 1954, and a Ph.D. from Emory University in 1969. Dr. Falconer also received an M.S. degree in Computer Science from Atlanta University in 1982. She has been on the faculty of Spelman College since 1965, having served as chair of the Department of Mathematics, 1972-82, and Chair of the Division of Natural Sciences, 1982-90. Since 1991 she has been Associate Provost for Science Programs and Policy and Fuller E. Calloway Professor of Mathematics. in 1995 the Association for Women in Mathematics presented Dr. Falconer with their Louise Hay Award for Contributions to Mathematics Education, acknowledging her "efforts to enhance the movement of minorities and women into scientific careers."

Professor Falconer spoke in the ninth floor conference room on the day of commencement on the subject "The challenge of diversity for the mathematical community." The talk was preceded by a reception. After the commencement, there was a dinner in honor of all honorary degree recipients at the home of Chancellor David Ward.

Etta Falconer

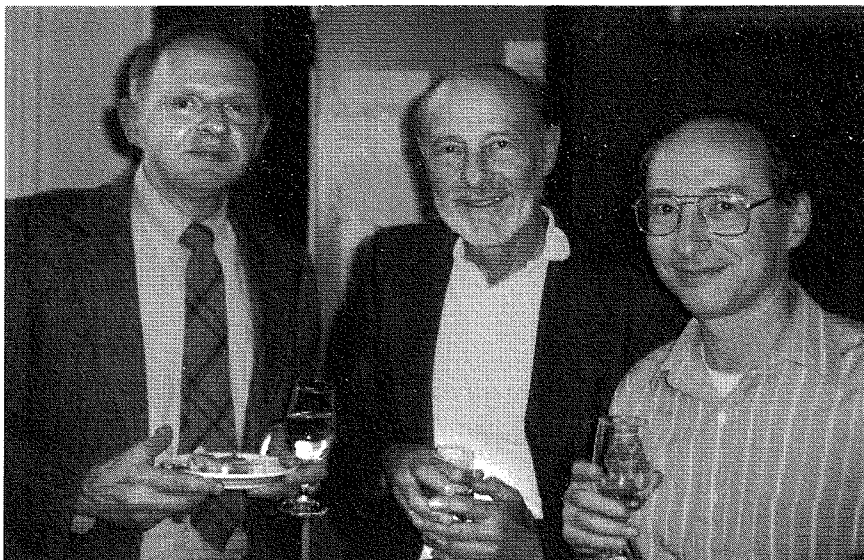## ED FADELL HONORED ON HIS 70TH BIRTHDAY
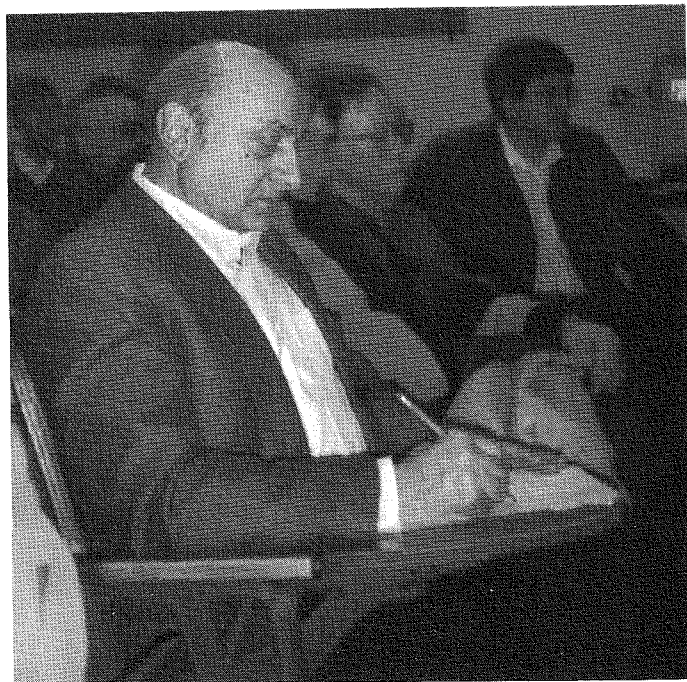
A conference was held in Madison on April 12-13, 1996 in recognition of Ed Fadell's 70th birthday (March 8, 1926). As reported in last year's newsletter, the invited speakers were A. Dold, F. Cohen, R. Brown, K. Millett, and S. Husseini. At the beginning of the conference, the chair Richard Brualdi spoke these words about Ed:

"Ed Fadell has had and continues to have a remarkable career as a mathematician and educator: PhD in 1952 from Ohio State University; Three years as Pierce Instructor at Harvard; Thirty eight years of full-time service at UW-Madison followed by five years of part-time service (1993-98); Twenty two PhD students; Approximately 60 papers in distinguished journals; A distinguished teaching award with accolades still continuing (Just last year I received a letter from a student of his in an undergraduate topology course who wanted to inform me of Ed's 'exceptional teaching ability'. This, of course, only confirmed what we already knew.); 'Adopted' by universities in Heidelberg and Pisa, and maybe Milano as well. Ed has even had a singing career in Madison (I recall a small role he had in a performance of La Traviata in Madison a number of years ago).

Ed Fadell

It's hard to believe that we are celebrating Ed's 70th birthday this weekend. He looks much the same as he did twenty years ago, and his energy (mental and physical) does not seem to have diminished. But we are celebrating more than Ed's 70th birthday. We are also celebrating his impressive mathematical legacy. Those of you who have come from out of town to be here this weekend are here to honor Ed as both a friend and a mathematician. I know that Ed appreciates it, but so do all of his colleagues here in the Wisconsin Mathematics Department. By honoring Ed you are indirectly honoring us all. So thank you for coming, enjoy the meeting and our facilities here, and thank you Ed for coming to Madison and staying with us all these years."

Special Lectures...

The second Wolfgang Wasow Memorial Lecture was given on April 24, 1996 by Professor Joe Keller of Stanford University. Professor Keller is a member of the National Academy of Sciences and a winner of SIAM's von Neumann Prize. The title of his lecture was "Wave Propagation." A reception in the ninth floor conference room followed the lecture. Professor Louis Nirenberg of the Courant Institute (NYU) has been chosen as the third Wasow Lecturer. Professor Nirenberg, who is a recent National Medal of Science winner, will visit the Department on April 2-4, 1997.

Thanks to contributions by Elsevier Science Inc., which publishes the journal "Linear Algebra and its Applications (LAA)", edited by Richard Brualdi and Hans Schneider, a new special lecture, the "LAA Lecture" was initiated this past year. The first LAA Lecture was given on May 1, 1996 by Professor Chandler Davis of the University of Toronto. The title of his lecture was "The true measure of a matrix. A reception in the ninth floor conference room followed the lecture. The second LAA Lecturer is Professor Ludwig Elsner of the University of Bielefeld. His lecture will be given on May 9, 1997.

Bob Turner, Joseph Keller, and Paul Rabinowitz

The Department has had, as usual, a lively and informative colloquium series featuring many distinguished speakers -too numerous to mention here. A number of other special talks in the ninth floor conference room were given this past year. They include:

January 17, 1996, Barry Cipra (a free lance writer who covers mathematics for "Science", writes regularly for SIAM NEWS, and has done much of the writing of the American Mathematical Society's annual publication about what has happened in mathematics recently), "What's Happening in the Mathematical Sciences: A Volume 3 Sampler."

May 8, 1996, James Stewart (McMaster University and author of a well-known calculus book), "How to enliven the calculus classroom."

October 4, 1996, Lance Small (UC-San Diego and NSF), "What's happening at NSF and what's on the horizon."

NEW DISTINGUISHED LECTURE SERIES

This year the Department also initiated a Distinguished Lecture Series. We were especially pleased to have Professor Gang Tian of MIT as the fall Distinguished Lecturer. Professor Tian received a PhD from Harvard in 1988 and has since held positions at Princeton, Stony Brook, Courant Institute, and now MIT. He also hold Professorships at the Mathematics Institute of the Academia Scinica and at Peking University. In 1990 he gave an invited address at the International Congress of Mathematicians in Kyoto. He was the recipient in 1994 of the 19th Waterman Award from the National Science Foundation and the 1996 Oswald Veblen Prize (jointly with Richard Hamilton) given by the American Mathematical Society for his contributions to geometric analysis. The title of his series was "Recent developments in differential geometry". He presented three lectures: (1) The Riemann mapping theorem in differential geometry, (2) Compactifying the moduli space of harmonic maps, and (3) The Einstein equation in complex geometry.

Professor Carl Pomerance of the University of Georgia has been chosen as the spring Distinguished Lecturer. He will deliver a series of lectures on modern number theory and its applications when he visits Madison on April 14-17, 1997.
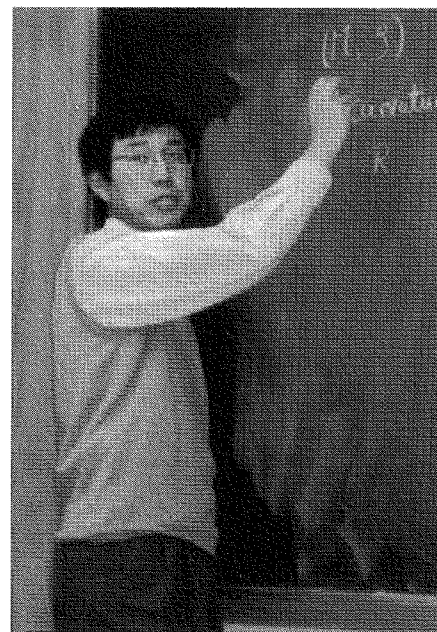
Student News...
Undergraduate

UNDERGRADUATE SCHOLARSHIPS

Our Scholarship Committee this year selected the following
students for undergraduate Math scholarships:

**Professor Linnaeus Wayland
Dowling Scholarship**   George M. Conard

Irma L. Newman Scholarship   David P. Mandelin

Mark Ingraham Scholarship   William S. Retert
                                          Turi E. Swan

Frank D. Cady Scholarship   Jeffrey R. Ylvisaker

CONGRATULATIONS!

MATH AWARENESS WEEK OBSERVED

The theme of Math Awareness Week this spring (April 21-26,
1996) was "Mathematics and Decision Making." The Math
Department observed the week with three special lectures:
Professor Phil Straffin of the Department of Mathematics and
Computer Science of Beloit College spoke on "Spatial models
of voting power and voting outcomes"; Professor Thaelia
Zariphopoulou (Departments of Finance and Mathematics)
gave a talk on "Applications of differential equations and
stochastic processes in derivative markets"; and Professor
Anatole Beck spoke on "Proxy representation and random
elections." All talks were given in the ninth floor conference
room. The theme of Math Awareness Week this year (April
20-26, 1997) is "Mathematics and the Internet."

MAJOR CHANGES IN THE HONORS PROGRAM

Under the energetic leadership of Professor William Cronon of
the History Department, the L&S honors Program is
undergoing a major revision. The present Honors Program is
being replaced by two programs, each of which would lead to a
designation of Honors on the student's transcript. The
programs are: "Honors in the Liberal Arts" and "Honors in the
Major."

The honors in the liberal arts program will require the student
to earn 24 Honors credits in introductory and intermediate
courses chosen from disciplines "distributed across the
curriculum in the best tradition of a liberal education."

Each L&S department has been asked to plan its new "Honors
in the Major" program without any reference to an L&S honors
program. The "freestanding" department program is to define
the best possible training for our strongest undergraduates,

preparing them to be competitive applicants to the best graduate
programs.

Recruiting for the Mathematics Honors Program will begin
when we recruit high school students for our special calculus
sequence Math 275-6. Some of the students will choose majors
other than mathematics but it is hoped that many of them will
take the honors course Math 223 (third semester calculus) and
will choose a mathematics honors major. Here is a summary of
our new basic program as it would work for the typical honors
student starting with Math 275.

Semester	Course(s)
1	275
2	276
3	223H
4	340H (linear algebra)
5	521H (advanced calculus I and
	541H (modern algebra I
6	522 (advanced calculus II) and
	542 (modern algebra II)
7 and 8	681/682 (senior thesis) or
	700 sequence (graduate level)

Other recommended courses include Math 551 (topology) and
Math 490 (undergraduate seminar).

MAJOR REMODELING EFFORTS

Two classrooms in Van Vleck Hall are undergoing major
remodeling this year. Room B-107 will become an "electronic
classroom" in the spring semester and will be equipped with 20
computer stations (up to 40 students) for hands-on use by
students. With an additional computer station for an instructor,
we anticipate that many courses that can benefit from active use
of computers by students during class will make use of this
room. These include courses such as Math 340 and 443
(elementary and applied linear algebra), Math 431
(probability), Math 132 (mathematical modeling for elementary
education credential candidates), Math 571 (mathematical
logic), and some calculus courses.

Beginning in January, the large lecture room B-130 in Van
Vleck Hall will literally be torn apart in order to become a
state-of-the-art lecture hall equipped with all sorts of
technological and other modern equipment. Rod Smart and
Bob Wilson have been involved with the designers and
architects in making sure that the room will meet the needs of
those teaching mathematics (especially calculus) in this room.

Graduate
EIGHTEEN PHDS AWARDED

Eighteen graduate students were awarded PhDs this past year. They are listed below along with their advisors, title of thesis, and new location (if known):

Berkove, Ethan J., A. Adem, "Cohomology of the Bianchi groups", West Point Military Academy

Choi, Youngwoo, S. Wainger, "L^p-L^q mapping properties of convolution operators with affine arclength measures on curves in R^n"

Collamore, Jeffrey F., P. Ney, "Large deviation techniques for the study of hitting probabilities of rare sets", Dept. Statistics, U. Ill-Urbana-Champaign

Collins, Benjamin V.C., P. Terwilliger, "Some problems in the theory of distance-regular graphs", Dept.Math & Comp Sci, Midland Lutheran Coll., Fremont NE

Curtin, Brian W., P. Terwilliger, "Bipartite distance-regular graphs", Grad Sch of Math, Kyushu U., Japan

Doree, Suzanne I., I.M. Isaacs, "Subgroups with the character restriction property and normal complements", Augsburg College, Minneapolis MN

Eng, Oliver D., G. Benkart, "Fixed points of involutions on Littelmann's path basis, cosets, and tableaux", Epic Systems, Madison WI;

Ettinger, John Mark, H.J. Keisler, "Topics in combinatorial games", Los Alamos National Lab., Los Alamos NM

Evans, Kellie M., D. Griffeath, "Larger than life; it's so nonlinear", York College of PA, York PA

Forsythe, Robert C., J. Robbin, "Dynamical systems and temporal-modal logic"

Godbey, Kevin S., D. Shea, "Some results in function theory"

Guner, Necdet, S. Husseini, "Borsuk-Ulam type theorems for Heisenberg Lie group action"

Hart, Joan E., K. Kunen, "Some results in set theory", Fellow, Dept.Math., Union College, Schenectady NY

Hogan, Thomas A., Amos Ron, "Characterizing stable and independent shifts of refinable functions", Vanderbilt U., Nashville TN

Raw, Matthew J., T. Millar, "Complexity of automorphisms of recursive linear orders", Management Info. Spec., State of Wis., Madison WI

Shayya, Bassam H., S. Wainger, "A class of strongly singular integral operators", Amer. U. of Beirut

Villaveces, Andres, K. Kunen, "Extensions of models of set theory: height and large cardinals", Math. Inst., Hebrew U. of Jerusalem

Yi, Jeong Seon, P. Ahern, "A characterization of the functions fixed by a class of integral operators", Taegu Hyosung Catholic U., Kyungpook, Korea

NEW GRADUATE STUDENTS

Thirty new graduate students enrolled in the Mathematics Department this fall. Their names and previous institutions are:

Kurt Berger (Case Western Reserve and MIT)
Bohui Chen (Sichuan University)
Cheoi-hyun Cho (KAIST)
Andrew Christleib (U. of Michigan-Dearborn)
Sergei Chumakov (Novosibirsk U.)
Andrew Evenson (Brigham Young U.)
Gordon Goldthorpe (U. of Toronto)
Jennifer Halfpap (Ripon College)
Michael Hall (UW-Madison)
Olga Holtz (Cheyabinsk Tech. U.)
Patrick Honner (Wayne State U.)
Marie Huedepohl (Lawrence U.)
Seok Hwang (Yeungnam U.)
Alexandra Ivanshina (Rochester Inst. Tech. and Kazan U.)
Asim Jalis (Utah State U.)
Liang Jie (Nankai U.)

Thomas Kent (NE Missouri State U.)
Youngsuk Lee (KAIST)
Yugang Liang (Nankai U. and Ohio State U.)
Hongju Liu (Beijing U.)
Chuan Long (Beijing U.)
Mainak Poddar (Indian Statistical Inst.)
Adam Resnick (U. of Pennsylvania)
Theodore Ridgway (Amherst College)
Leona Sparaco (Siena College)
Jonathan Todd (Williams College)
Taras Vovkivsky (Rochester Inst. Tech. and U. of Chernivsti)
Wei-Shun Wang (National Central U. of Taiwan)
Dejia Wang (Academia Sinica)
Nengwu Zhu (Peking U.).

GRADUATE STUDENTS AWARDED FELLOWSHIPS

The Department has a grant from the Graduate Assistance in Areas of National Need Program of the U.S. Department of Education and has awarded fellowships for the spring semester to a number of current graduate students so that they can concentrate on completing their dissertations. Receiving awards this year are: Heather Ames Lewis, Cheryl Grood, Stephanie Edwards, Nancy Neudauer, John Caughman, Jeffrey Strom, Mark Logan, Paul Hermann, Aaron Montgomery, Christopher Kribs, Evelyn Torres-Gallardo, Darren Parker, Douglas Lepro, and Jeffrey Riedl.

In addition, Susan Hollingsworth is the recipient of a fellowship for the spring semester from the Elizabeth Hirschfelder Fund for Graduate Women in Mathematics, Chemistry, and Physics.

TEACHING AWARDS FOR TAS

The Teaching Assistant Evaluation Committee last year selected the following TAs to receive Excellence in Teaching Awards: **John Brown, Stephanie Edwards, Cheryl Grood, Nancy Neudauer, Berit Nelson, Bassam Shayya, Lei Shen**. Each was given a $75 gift certificate and a certificate of the award suitable for framing.
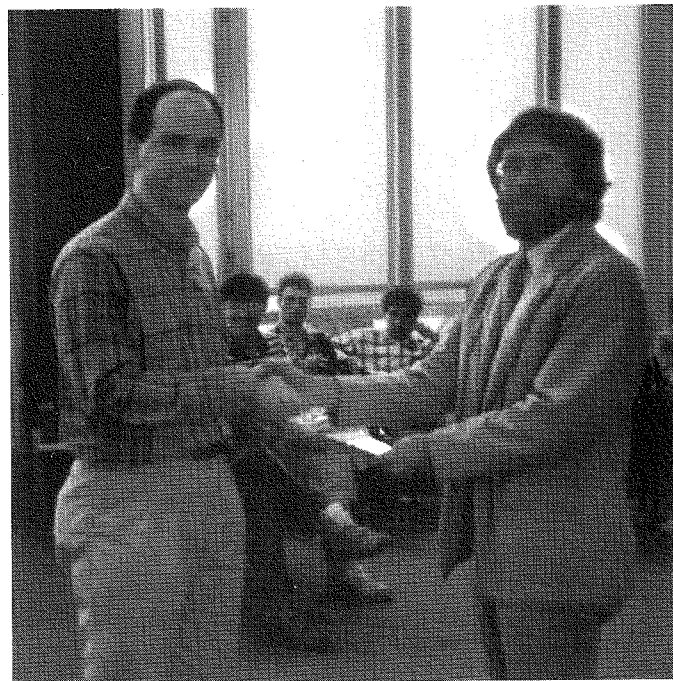
In addition, a new award, *Sustained Excellence in Teaching Award*, was awarded to two TAs: **Ben Collins** was recognized for his teaching and his work as placement coordinator and his work hosting potential graduate students and organizing of Sidewalk Math. **Christopher Kribs** was recognized for his work on the Graduate Program Committee the hosting of potential graduate students, and the Summer International TA program. Ben and Christopher were each given a $75 gift certificate and a certificate of the award suitable for framing.

Two of our TAs were selected as L&S Teaching Fellows in recognition of the high quality of their performance as a TA. They were **Susan Hollingsworth** and **Christopher Kribs**. The award consisted of a check for $500 and they were given the honor of leading a workshop for new TAs during Welcome Week for 1996-97.

Ethan Berkove was given a campus-wide 1995-96 Graduate Student Excellence in Teaching Awards. He was honored for his ability and creativity as teacher, for quality of graduate work, and contributions to instruction. A check of $700 was presented to him.

Christopher Kribs and Richard Brualdi

QUANTITATIVE REASONING AND TEACHING EVALUATIONS

The entering class at UW-Madison this year is the first class for which the new general education requirements apply. Among these requirements are two courses in quantitative reasoning: part (A), a course in quantitative reasoning in mathematics, computer science, statistics, or formal logic, and part (B) a second course in quantitative reasoning in any discipline. A student can be exempted from part (A) by high enough placement scores. This semester the Mathematics Department is experimenting with a new course that is being designed specifically for part (A). This course is a challenge for those of us teaching it this year (Steve Bauman, Mike Bleicher, Richard Brualdi, and Phil Miles). Almost all students taking this course would in the past not have taken any mathematics course for their undergraduate degree and most likely would have avoided all courses with a substantial quantitative component. This is no longer possible. The following story demonstrates quite clearly why UW-Madison's new general education requirement in quantitative reasoning is a good thing.

Since records of teaching evaluations of faculty have recently been judged to be public information, the Associated Students of Madison (ASM) has been compiling a booklet of "Professor Evaluations." Each semester ASM publishes overall ratings in a booklet that is widely distributed all over campus. The Department of Mathematics computes overall ratings on a 0-4 scale. We send to ASM the number of responses giving each of the ratings 0 (Very Bad), 1 (Poor), 2 (Fair), 3 (Good), and 4 (Very Good) as well as the average (the overall rating). Since ASM uses a 1-5 scale, they adjusted our averages by multiplying by 5/4 thinking that this would properly rescale our computation to one based on a 1-5 scale. Unfortunately as you have no doubt already observed, this is not correct. Multiplying by 5/4 rescales to 0-5 with ratings: 0, 1.25, 2.50, 3.75, and 5.00. The result is that the overall ratings in Math appear lower than they actually are. The correct way, of course, for ASM to rescale is to add 1 to our overall rating.

The WES calculus program began its fourth academic year this fall with two sections of Math 221, and one each of Math 222 and Math 223, enrolling a total of 73 students. The WES program is modeled on one begun at UC-Berkeley in the 1970s by Uri Treisman. Its goal is to foster success in calculus for students who are talented mathematically, but who might be intellectually isolated on a large campus. Such students can come from minority groups, or from rural backgrounds, or they can be women not used to talking about mathematics. They might be any of a number of UW students!

WES calculus is a special discussion section attached to a large calculus lecture. Students in this section meet for two hours, three times a week. During these two hours the students work in small groups on non-routine problems created by the Teaching Assistant in charge of the class. The class is very active and lively, and the students learn about the frustrations and joys of working on good, hard math problems.

The excellent performance of the WES classes has attracted attention recently. In the Fall semester of '95-'96, the two

Local Chapter of Noetherian Ring Formed

The Noetherian Ring is a group of women in mathematics with chapters throughout the nation (e.g. UC-Berkeley, U. of Florida, MIT). Here at Madison, the Ring meets every two to three weeks to hear talks given by women mathematicians. These talks are open to the entire mathematical community.

The current officers are Cheryl Grood, Heather Lewis, and Jennifer Ziebarth. Speakers so far this year have been:

Dr. Gloria Mari-Beffa (UW-Madison)
"Normal Forms for Differential Equations and the Geometry of Infinite Dimensional Manifolds"

Stephanie Edwards (UW-Madison)
"Really Cool Real Entire Functions and Extraordinary Zeroes"

Olga Holtz (UW-Madison)
"Classification of Normal Matrices in Complex Spaces with Indefinite Scalar Product"

Maria Basterra (U. of Chicago)
"An Introduction to Stable Homotopy Theory"

Members of the Ring will be volunteering to mentor women majors. Stephanie Edwards and Cheryl Grood are hosting a "kick-off" for this mentoring program which will give all a chance to get to know each other. The Ring is also working with the Undergraduate Math Club to help staff final exam "help sessions" for upper-level courses. Katie Thompson is organizing the Math Club this year.

Next semester's speakers will include talks by Arlene Pascasio and Jennifer Ziebarth.

223 sections had the top GPAs of any section in their lecture; the 222 section and one of the 221 sections also ranked first; and the other 221 sections ranked third and fourth. In the Spring semester three of the four WES sections ranked first in their lecture. Also important for the program's goals is the fact that none of the 222 WES students dropped out of calculus during the semester.

There are other WES success stories! If you want to know more about the WES program, contact its Coordinator Melinda Certain, or anyone on the WES Faculty Committee: Professors Steve Bauman, Mike Bleicher, and Terry Millar.

OTHER COURSE DEVELOPMENTS

Math 130-131-132: a sequence for Elementary Education Credential Candidates. The clients for this course are tomorrow's teachers. In order to reverse the spiral of decline in mathematics education, it is important that they learn some basic (high school level and below) math that they have somehow failed to learn on their first several tries. Faculty who teach 130-131-132 have to be able to get into these students' minds and unblock them. This is done by replacing the usual problem sets for this material with a set of challenging problems whose solution requires the students to invent ideas they haven't been shown. Small-group cooperative learning is used extensively, with instructors helping the students to pinpoint where they are stuck and facilitate their solving the problem on their own. The 130-131-132 sequence also calls for a significant amount of written work from the students. Homework solutions must be fully explained, for instance, what variable is used for what quantity, whether any extra assumptions were

necessary, and so on.

A training program for first time instructors of this course is already in place. This involves an ongoing sequence of classroom visits, demonstrations and peer critiques. A good curriculum is of course essential, but that is the easy part. The crucial classroom handling skills are what cannot be learned long-distance. These involve how to give students enough room to develop their own ideas without losing mathematical focus and degenerating into a mathematical version of non-directional therapy. For more information, contact Robin Pemantle *(pemantle@ math.wisc.edu)*.

Math 112: College Algebra/Precalculus. Teaching is still done in stand-alone small sections but now teaching has new meaning in the once-a-week class devoted to small- group problem solving. The problems are totally new to the students, and the teachers role is to encourage groups to make their own approach, not to lead to a predetermined solution. It's challenging for all, fun for some, and a demonstration that one doesn't need a worked example if one uses

one's powers of reasoning. The course also satisfies part A of the new quantitative reasoning requirement. Other changes in Math 112 include a pruned syllabus and a more conscious effort to move students toward meeting college-level expectations. For more information, contact Phil Miles (*miles@math.wisc.edu*).

Math 721-722: Graduate Analysis. These two basic courses in Analysis have now become three: Math 721-722-725. Math 721 is now "A first course in real analysis" (Measure and Integral, An introduction to Hilbert Space, ...), Math 722 is "Complex Analysis" and Math 725 is "A second course in real analysis" (An Introduction to Banach Spaces, An Introduction to Fourier Transforms, Elements of distribution theory, Applications). Math 721 is offered in the fall semester and is to be taken by all students in Analysis. Both Math 722 and Math 725 are offered in the spring semester. The qualifying exam in analysis is being modified and will have two parts to it. Part A is based on Math 721. Part B will have two parts and students will have to choose the "722 part" or the "725 part."

Math/CS 712: Finite Difference Methods. Formerly a course only in computer science, this course is now cross-listed with the Department of Mathematics. In the spring, it will be co-taught by two faculty in the Mathematics Department. Paul Milewski and Jean-Marc Vanden-broeck. Paul and Jean-Marc will also be co-teaching Math 704: Methods of Applied Mathematics II.

Alumni News

Bruce Berndt (PhD 1966, J.R. Smart) won the 1996 Steele Prize for Exposition for his four volumes on Ramanajuan's Notebooks. The prize was shared with J. Fulton.

Chuck Hampton (PhD 1972, D. Passman) writes that he has been at The College of Wooster since he got his PhD and recommends the small liberal arts college to those who love teaching. This year Chuck was named to the Johnson Professor of Mathematics (curiously just as Don Passman was named the Richard Brauer Professor at the UW).

Hy Pitt (BS 1948 & MS 1949) writes that his favorite math prof was the late Cyrus Colton MacDuffee, as was Steve Kleene. Last year his book: SPC FOR THE REST OF US: A PERSONAL PATH TO STATISTICAL PROCESS CONTROL (Addison-Wesley) was published. He says that he has taught the material for 30 years, mostly as an independent consultant in industry, and retired in 1994. Hy is a Fellow and former director of education and training of the American Society for Quality Control (ASQC), a professional organization of 140,000 members, headquartered in Milwaukee. He developed the ASQC Certified Quality Engineer (CQE) exam program in 1968 that has since become world famous.

John D. Prange (PhD 1976, J. Chover) is currently the Technical Director for the Language Processing Advanced Technology Center within the Department of Defense. After graduating from UW, he taught mathematics computer science, and statistics in the Mathematical Sciences Department of Capital University in Columbus, OH (Aug 1975 - May 1984). He has been with the Department of Defense since 1984 and has held a variety of technical and managerial positions within the fields of artificial intelligence, natural language processing, and text processing.

George Robinson (MS 1969, J.B. Rosser) writes that although the U.S. Army is not a "growth industry" (that's VERY good!), he's still working for them in Rock Island, Illinois, as an Operations Research Analyst. Mathematical games and puzzles are continuing interests of George, as are foreign languages and historical war gaming.

Harry C. Mullikin (PhD 1968, S. Gudder) writes that for the fifth time in his teaching career at Pomona College, he was granted this year the Wig Distinguished Teaching Award. This award is given annually to outstanding professors selected by their students on the basis of their teaching, concern for students involvement in student-faculty research, and other special services rendered to the College and the community. Harry is the William Polk Russell Professor of Mathematics at Pomona College.

Lowell Tonnessen (PhD 1980, J. Harvey) has been working at the Institute for Defense Analyses (IDA) since 1984. His work is in support of the Pentagon's chief testing office (Director, Operational Test and Evaluation). Basically, he says that he writes reports assessing the performance of weapons systems and that these reports support decision makers in the Pentagon, and they also are sent to the Congress. There is very little mathematics in his work, but some sort of technical background is needed.

Ahmad Muchlis (PhD 1991, H. Schneider) has been appointed department head at the Institut Teknologi Bandung in Bandung 40132 Indonesia.

(Send your news to: brualdi@math.wisc.edu)

The Rest of the News...

The annual Math Dept potluck dinner was held in the ninth floor conference room on May 4, 1996. There were nearly 100 people in attendance. While Madison now has a lot of very good restaurants, none can compare in quality and variety provided by our own cooks. The food was absolutely delicious. The occasion also gave us an opportunity to congratulate Walter Rudin on his 75th birthday. Walter's sister Vera was here for the occasion. You never heard Happy Birthday sung so well, and a birthday cake with "blow-out proof" candles on it stumped Walter for several minutes!

- **Donald Crowe** gave the invited talk: "Mathematics Everywhere: Ethnomathematics and Symmetry" at the banquet of the MAA Wisconsin Section at UW-Platteville on April 12, 1996.

- **John Nohel** is co-editor with David Sattinger (U. of Minnesota) of the SELECTED WORKS OF NORMAN LEVINSON (two volumes, Birkahuser, 1997) in 1997 in two volumes. Both co-editors were PhD students as well as Fred Brauer, Howard Conner and Jake Levin are among Levinson's 34 PhD's. Volume 1 (John's chief concern) will be devoted to Levinson's papers in differential & integral equations, while Vol. 2 will contain selected papers in harmonic, complex, & stochastic analysis and number theory.

- **Steffen Lempp** spent the spring semester 1996 at the University of Leeds, England, where he enjoyed the company of even more logic faculty than at UW. Besides research, he was busy learning the ropes of a managing editor and of negotiating with publishers on translations of Eastern European books into English. The summer involved quite a bit of traveling, including invited talks in Beijing and San Sebastian, Spain.

- **Franc Forstneric** gave an invited plenary lecture at the AMS Central Section Meeting in March 1996. The title of his talk was "Holomorphic automorphisms of C^{n}."

- **Alejandro Adem** gave an invited plenary lecture at the AMS Central Section Meeting in November 1996. The title of his lecture was "Recent Developments in the Cohomology of Finite Groups."

V AN
LECK
NOTES

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