



Department of Mathematics
University of Wisconsin

Van Vleck Notes 2003



From the Editor...

In 1997 the UW-Madison Mathematics Department celebrated the 100th anniversary of the granting of the first PhD in Mathematics by the University of Wisconsin. Many of you were present at our PhD Centennial Conference held in Madison during May of 1997, some as former PhDs and some with PhDs still in progress. As many of you may recall from our 1997 newsletter, the first Wisconsin Mathematics PhD was awarded to Henry Freeman Stecker in 1897 with a thesis titled "On the roots of equations, particularly the imaginary roots of numerical equations." Stecker, a native of Sheboygan, Wisconsin, went on to have a successful career at Penn State University.

There were many highlights of our 1997 celebration, but none as thrilling as the festivities of the banquet in the Memorial Union when the many Wisconsin PhDs present were introduced. Among them were the "fifty or more years group" consisting of Lowell Paige [PhD, 1947, R.H. Bruck], William Leavitt [PhD 1947, R.E. Langer], Robert Lee Wilson [PhD 1947, C.C. MacDuffee], Robert Bartels [PhD 1938, I. Sokolnikoff], Margarete Caroline Wolf Hopkins [PhD 1935, M. Ingraham], and Elizabeth (Betty)

Thatcher Stafford Hirschfelder, [PhD 1930, M. Ingraham]. Betty's class contained the 18th, 19th, and 20th Wisconsin Mathematics PhD. Sadly, as reported elsewhere in this newsletter, Betty died this past year.

Those of you who participated in the celebration in May of 1997 may remember our "logo" representing the number of Mathematics PhDs awarded after 100 years:

$$\int_{1897}^{1997} \text{Math PhD } dt = 900 \pm \epsilon.$$

The ϵ reflected the uncertainty of how many graduate students would actually finish in 1997. Now our website contains a current list of all Wisconsin Math PhDs. You can find it at

<http://www.math.wisc.edu/directories/alumni.html>

The current Mathematics PhD count is 982 which means that sometime within the next year or so we are expected to reach the 1000 mark:

$$\int_{1897}^{200x} \text{Math PhD } dt = 1000.$$

The attainment of such a milestone, which could occur in any of the months May, August, or December, will be good reason for a local celebration, followed by a special Wisconsin Reunion at the annual AMS Meeting (Will it be Phoenix 2004 or Atlanta 2005?). We hope to see many of you there. Watch our website for when this milestone is reached.

Now read about what's been going on this past year in the UW-Madison Mathematics Department. And please stay in touch by letting us know what's been happening in your professional career. We have an alumni section in this newsletter for your news. And don't forget to update your addresses (see page 25 of this newsletter) if there has been a change. We want to make sure that this newsletter reaches you.

...RAB

From the Chair...

I am delighted to have this chance, 6 months into my first year as Chair, to share a few words with the UW Math community. My new job has a steep learning curve, especially in these challenging times, so first off I would like to thank the previous two chairs, Richard Brualdi and Alejandro Adem for their generous and ongoing support. Thanks to their guidance, and with the help of our superb faculty and staff, I am confident the department will continue its tradition of excellence.

Last year we had one of our best hiring seasons ever with the addition of 3 distinguished tenured professors: Nigel Boston, Xiuxiong Chen, and Alexander Kiselev. Nigel Boston joins our excellent applied math program as a cluster hire, joint with Electrical & Computer Engineering. Xiuxiong Chen, a speaker at the most recent International Congress of Mathematicians, augments our world-class geometry group. Alexander Kiselev is a talented young analyst with interest in applications who, like our other recent addition to the analysis group Alexandru Ionescu, has recently won a Sloan Fellowship. We are very excited about this influx of world-class talent.

As always, Madison is buzzing with math conferences, workshops and seminars this year. Here I will just mention some highlights. Last fall we hosted the AMS Central Section meeting. This spring Xiuxiong Chen is organizing the Great Lakes Geometry Conference, May 1-4, in honor of E. Calabi. Summer 2003 events include a Research Experience for Undergraduates hosted by Ken Ono and the annual Probability Intern Program hosted by Jim Kuelbs and Tom Kurtz.

Our faculty and staff also continue to garner an impressive array of honors and awards. For lack of space, let me single out Melinda Certain, who has just won the prestigious Chancellor's Hilldale Award for Excellence in Teaching. Sadly, Melinda is retiring at the end of the semester after nearly 15 years of outstanding service, highlighted by her role as Coordinator of our very successful Wisconsin Emerging Scholars program.

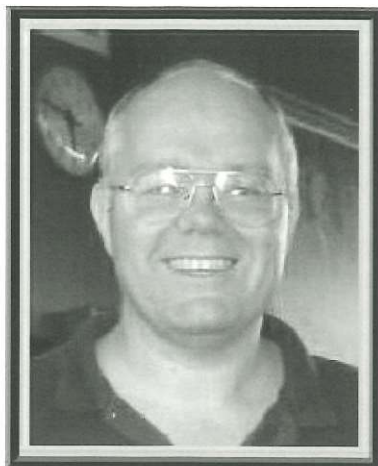
Many of you undoubtedly know that the State and University are now confronting a serious budget crisis. As a result, our department is being asked to make substantial cuts in all our operations. Hiring this year will be confined to cluster initiatives in Molecular Biometry and String Theory, as well as a few Van Vleck postdocs. So my current agenda for the department focuses on some major improvements to our building and office space, as well as our computing infrastructure. I hope to report back to you next year with good news in these areas. If I may be forgiven a modest solicitation, suffice it to say that even small donations are especially meaningful in times like this. Without your gifts it is more and more challenging to sustain our excellent research and teaching programs.

Finally, let me encourage everyone to stop by the department next time you're in Madison. Alternatively, consider visiting the Annual Wisconsin Reunion of Alumni and Friends next January in Phoenix at the Joint Mathematics Meetings. Either way, I look forward to meeting you.



Cheers,
David Griffeth, Chair
Department of Mathematics

New Faculty



Professor **Nigel Boston** was hired this past year as part of the UW-Madison's strategic hiring initiative. His appointment is 75% time in Mathematics and 25% time in Electrical & Computer Engineering (ECE). Nigel did his undergraduate work at Cambridge University (England), and received the PhD from Harvard University in 1987 where his advisor was Barry Mazur. The title of his thesis was "Deformation theory of Galois representations." After the PhD he spent one year at I.H.E.S. in France and two years as a Morrey Assistant Professor at the University of California-Berkeley. He had been at the University of Illinois since 1995. Nigel was an Alfred P. Sloan Foundation Fellow from 1994 to 1996. Nigel's research interests are varied: algebraic number theory, group theory, arithmetic geometry, computer algebra systems, and interdisciplinary mathematics in general. Nigel also has a 0%-time appointment in our Computer Sciences Department, which allows him to supervise theses of computer sciences students.

At Illinois, Nigel had 8 Math PhD students plus 4 Research Assistants from ECE. His most recent PhD student has gone to work for McKinsey Management Consultants. While Nigel arrived in Madison only about 6 months ago, he has already taken on one PhD student in Math and one in ECE. In the fall one of Nigel's former students, Doug Kuhlman, now at Motorola Labs, gave a talk on computer security in the department's VIGRE Brown Bag

seminar and in the CS computer security seminar.

Nigel's eclectic interests are reflected in his many recent and future activities. He gave an invited talk at the Chicago International Intellectual Property Conference at the InterContinental Hotel in Chicago organized by lawyers from US, UK, and Canada. At this meeting he was on a panel with both the deputy governor and homeland security director of Illinois, the past-president of the American Microbiology Society, and Lee Tien of the Electronic Freedom Foundation. The title of his invited talk was "Is Biometrics Measuring Up?" and it has been submitted to the *Journal of Law, Technology, and Policy*. Nigel also gave invited talks at John Thompson's 70th Birthday Conference, to MIT electrical engineers and to the Amherst Five Colleges Seminar on number theory. In May of this year he is off to Oberwolfach for the profinite groups meeting to be followed by a visit to number theorist Pink and electrical engineer Boelskei at ETH Zurich.

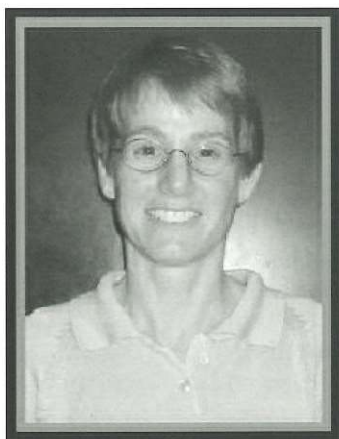
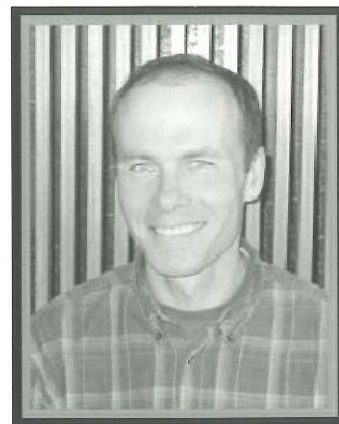
At Motorola Labs, Nigel organized the first meeting of MISC (Midwest Information Security Consortium) with faculty from both Wisconsin and Illinois. According to Nigel, "the idea is to be ready once the homeland security bill promising almost \$1 billion for computer and network security research centers, filters down to funding agencies like NSF." He was one of 20 algebra, number theory and combinatorics (ANTC) faculty invited to NSF for a weekend-long discussion of how funding could or should best support computation. The group has prepared an approximately 100-page report on what they see as the future of ANTC and computation.

This semester Nigel is offering a course on the proof of Fermat's Last Theorem. This is his third time giving such a course and he is under contract with Springer to produce a book. You can look for his paper "Strategies for the Weakest Link" in the *American Math Monthly* in April of this year.

And this is only some of what Nigel Boston has been doing recently. You can understand why we are so enthusiastic about having him in our department.

Sergey Bolotin, Leslie Smith and Fabian Waleffe Promoted to Professor

Professor **Sergey Bolotin** has been an associate professor at UW-Madison since the fall semester of the 2001-02 academic year. Sergey received the Doctor of Science degree in March 1998 from the Department of Mathematics and Mechanics of Moscow State University. His research interests include dynamical systems, variational methods, integrability of Hamiltonian systems, and celestial mechanics. In 2001 he was awarded the S. V. Kovalevskaya prize of the Russian Academy of Sciences for his series of papers on integrability and nonintegrability in Hamiltonian systems (with V. V. Kozlov). In 1994 Sergey was an invited lecturer at the International Congress of Mathematicians held in Zurich. He is a member of the editorial board of the journal *Regular and Chaotic Dynamics*. During the last couple of years, Sergey has given invited talks all over the world, including the conference on Dynamical Systems in honor of John Mather (Princeton), the University of Barcelona, the University of Rome, and conferences on dynamical systems and differential equations in Moscow and St. Petersburg. Professor Bolotin had five PhD students while he was on the faculty of Moscow State University.

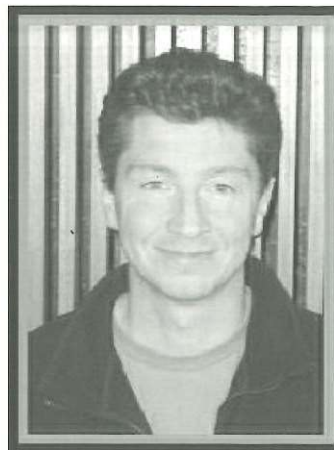


Professor **Leslie Smith** has been an associate professor of mathematics and mechanical engineering at UW-Madison since 1997. With the beginning of the 2002-03 academic year, she has moved her 25% time appointment in mechanical engineering to engineering physics. Leslie received the PhD in applied mathematics from MIT in 1988 and was in the Department of Mechanical Engineering at Yale University before coming to Madison. Her research interests include statistical physics, turbulence and turbulence modeling for engineering, geophysical and aerophysical applications, stability theory, and fluid dynamics. Professor Smith is on the editorial board of the journal *Communications in Mathematical Sciences*. In 2000 she was co-organizer of an AMS-IMS-SIAM Joint Summer Research Conference in Mathematical Sciences, *Dispersive Wave Equations* held at Mount Holyoke College in Massachusetts. Her many recent invited talks include those at the Oberwolfach conference on Mathematical Theory

and Modelling in Atmosphere-Ocean Sciences, the University of Maryland, and The Institute for Mathematics and its Applications in Minnesota. In May of this year Leslie is an invited speaker at the Utah Dynamical Systems Conference. Dr. Smith is PI on two large grants, one on Wave Turbulence in Atmospheric and Oceanic Flows (NSF) and the other on Investigation of Rayleigh-Taylor and Richtmyer-Meshkov Instabilities (Department of Energy).

This past semester Professor Smith taught the central course (Math 221 - first semester calculus) of a FIG (First-Year Interest Group). In addition to Math 221, the twenty students took together a chemistry course and a sociology course on problems of American racial and ethnic minorities, with the FIG students in the same lab and discussion sections. The FIG program is a new program at Madison, whose goals include helping new students adjust to university life and increased retention. To the extent possible, some of the content of the second and third courses of a FIG are integrated into the small central course. Leslie will be repeating the FIG next academic year.

Professor **Fabian Waleffe** joined UW-Madison as an assistant professor of mathematics and engineering physics in 1997. He received a civil engineering degree from the Université Liège in 1985. Fabian was promoted to associate professor in 1999. Fabian's PhD is in applied mathematics from MIT in 1989, and he was an assistant professor of applied mathematics at MIT before coming to Madison. His research interests include fluid dynamics, instabilities, self-sustaining dissipative structures, turbulence, and rotating flows. His other interests include aerospace and geophysics.



Recent invited talks include a plenary talk at the "International Symposium on Dynamics and Statistics of Coherent Structures in Turbulence" at the National Institute of Sciences in Tokyo, followed by a week-long visit at Kyoto University.

Fabian is a private pilot and got an airplane instrument rating last year which allows him to fly in clouds and bad weather; he took a week-long trip in a small airplane around the western US to complete the training. Last year he flew a small airplane to Michigan Tech to give an invited seminar and to Washington DC for an NSF panel review.

Eleny Ionel Promoted to Associate Professor



Eleny Ionel, who has been in the Mathematics Department since 1999, has been promoted to Associate Professor of Mathematics with tenure. Professor Ionel did her undergraduate work in Romania and received the PhD in mathematics from Michigan State University in 1996. In a recent delightful talk in the department's Brown Bag seminar, Eleny described how a sixth grade teacher in Romania (who was teaching in the elementary schools for three years prior to taking a position at a university) got her excited about mathematics in general and topology in particular. A consequence of his intervention and enthusiasm led to her participating in mathematical olympiads and eventually the PhD at Michigan State.

Before coming to Madison, Eleny was a Moore Instructor at MIT. She gave an invited lecture at the International Congress of Mathematicians in Beijing last summer as well as at the AMS regional meeting held in Madison in October, 2002. Other recent invited talks were given at the Gromov-Witten Invariants and Integrable Systems Conference at the Institute for Advanced Study in Princeton, the Ninth Gökova Geometry/Topology Conference in Gökova, Turkey, a conference on Advances in Complex, Contact, and Symplectic Geometry at the Scuola Normale Superiore in Pisa, Italy, and the Workshop on Frobenius Manifolds, Quantum Cohomology and Singularities at the Max Planck Institute for Mathematics in Bonn, Germany. Professor Ionel was an Alfred P. Sloan fellow in 2002; her research interests lie in symplectic topology and gauge theory, and Gromov-Witten, Seiberg-Witten and other related invariants.

Van Vleck Visiting Assistant Professors

We hired four new Van Vleck Assistant Professors this year, three of whom are supported partially by our NSF VIGRE grant.

Alfred Dolich received the PhD in 2002 from the University of Maryland. His thesis "On independence relations in model theory" was written under the supervision of M. C. Laskowski. Alfred has a BA in mathematics and chemistry from the University of Pennsylvania and a MA in mathematics from Columbia University. He lists his research interests as model theory, simple theories, and ω -minimal theories with secondary interests in algebraic geometry and set theory. Alfred is a VIGRE Van Vleck.



Natalia Rozhkovskaya received an MS (Diploma) from Moscow State University (Russia) and a PhD in 2002 from the University of Pennsylvania. Her thesis "Quantum family algebras" was supervised by A. A. Kirillov. Natalia lists her research interests as representation theory, combinatorics, Lie groups, and Li algebras.

John Vano received his PhD from the University of Texas at Austin in 2002. Earlier he received a BA in honors mathematics and honors physics from Gustavus Adolphus College in St. Paul, Minnesota. His PhD work was supervised by Rafael de la Llave; the title of his thesis was "Nash-Moser implicit function theorem with Whitney regularity and applications." John describes his research interests as investigation and exploration of real world problems and phenomena using the tools and techniques of dynamical systems, nonlinear control, geometry and partial differential equations. John is also a VIGRE and Project NEXT Fellow.



Jesenko Vukadinovic grew up in Bosnia-Herzegovina, studied in Sarajevu, received a *Diplom-Mathematiker* from Ludwig-Maximilians-Universität in Munich, Germany, and a PhD in Applied Mathematics from Indiana University in 2001. His thesis was supervised by Ciprian Foias and was titled "On the backward behavior of the solutions of the 2D periodic Kelvin filtered Navier-Stokes equations." Jesenko lists his research interests as partial differential equations, fluid dynamics, and kinetic theory. He is also a VIGRE fellow.

Visiting Faculty

Again in 2002-03 there are a number of visitors from other institutions who are teaching and collaborating in research with our permanent faculty. In addition, there are a number of honorary fellows here for extended periods to collaborate with faculty.

Fall Semester Teaching Visitors

Jaume Aguade from the Universitat Autònoma de Barcelona (Spain): algebraic topology.

Zoé Chatzidakis from UFR de Mathématiques (Paris): Logic.

István Juhász from the Alfréd Rényi Institute of Mathematics (Budapest): Logic.

Josu Sangroniz Gómez from the Universidad del País Vasco (Spain): character theory.

Boban Velickovic from UFR de Mathématiques (Paris): Logic.

Alex Wilkie from University of Oxford: Logic.

Professors Chatzidakis, Juhász, Velickovic, and Wilkie team-taught the logic course Math 975.

Spring Semester Teaching Visitors

James Wright [PhD 1990, S. Wainger] from the University of Edinburgh: harmonic analysis.

Other visitors in Madison for an extended period this year who are collaborating with faculty include:

Jong-Guk Bak, Pohang University (Korea)

Dongho Byeon, Seoul National University (Korea)

Yang Chen, Imperial College-London (England)

Nansook Cho, [PhD 1994, Kurtz], Hansung University (Korea)

Youngwoo Choi, Ajou University (Korea)

Jacob Christiansen, University of Copenhagen (Denmark)

Sylvie Corteel, Laboratoire PRISM, Université de Versailles (France)

Weiyue Ding, Academia Sinica (China)

Suk-Geun Hwang, [PhD 1985, R. Brualdi], Kyungpook National University (Korea)

Kyeonghoon Jeong, Yonsei University (Korea)

Rolando Jimenez-Benitez, Universidad Nacional Autónoma de México-Cuernavaca

Michael Kouritzin, University of Alberta (Canada)

Ki-Suk Lee, Korea National University

Peter Mayr, Johannes Kepler Universität Linz (Austria)

Alexander Moreto, Universidad del País Vasco (Spain)

Serge Randriambololona, Ecole Normale Supérieure de Lyons (France)

Liudmila Sabinina, Universidad Nacional Autónoma de México-Cuernavaca

Hiroaki Terao, Tokyo Metropolitan University (Japan)

Yoji Yoshii, University of Alberta (Canada)

Chunxiong Zheng, Tsinghua University (China)

Sabbaticals and Leaves

2002-03 Academic Year

Patrick Ahern on sabbatical all year, spent the fall semester working with mathematicians in Marseille, Barcelona and the Canary Islands. It wasn't all work however and certainly one of the highlights of the semester happened during the last week of September when Pat and his wife Kay met Melania Adem in northern Spain and walked for five days with her on the *Route of Saint James*. (Melania continued for approximately twenty-five more days and walked the entire Route, almost 800 kilometers). Pat is based in Madison for the spring semester.

Steffen Lempp is on sabbatical this year at the University of Heidelberg, Germany, partly supported by a Mercator guest professorship of the Deutsche Forschungsgemeinschaft. According to Steffen, there is a whole group of logicians who spend between a month and a year in Heidelberg, so it is a great place for him to be. He is teaching one advanced course (in English!) for the Mercator professorship. The students are in German schools and had some problems with the language at first, but now Steffen says they are much better. He gave an invited talk at the European Logic Colloquium in Muenster last August and will attend the next Eu-

ropean Logic Colloquium in Helsinki next August. While in Europe, he is giving seminar talks in Wuerzburg, Bonn and Leeds.

Arnold Miller is also on sabbatical this year. He spent the first semester at the Fields Institute (Toronto) for mathematical research. There was a four-month conference on Set Theory, including two workshops on Borel equivalence relations in descriptive set theory and applications of set theory to the theory of Banach spaces. He reports that it was an extremely productive and exciting semester. For the second semester he will be traveling across the country visiting various set theorists and attending Logic meetings at the University of Florida in Gainesville, Texas Tech in Lubbock, Boise State University in Idaho, and the University of Edmonton in Alberta.

Paul Rabinowitz was on sabbatical for the fall semester of 2002-03. He spent about half of his time in Madison. In addition he participated in a program in honor of John Mather's 60th birthday at Princeton for one month, gave several lectures in Taiwan, spent some time at Toyko University with a collaborator, and gave a series of lectures at a workshop in Kyoto.

2003-04 Academic Year

Three faculty members have been granted sabbaticals for the full academic year 2003-04.

Amir Assadi will spend the academic year in the Department of Neurobiology at Harvard University developing multi-scale theoretical modes of information processing in the human brain.

Georgia Benkart will be based in Madison during her sabbatical, finishing the writing of a book "Combinatorial Representation Theory" (with Arun Ram). In addition, she will be continuing her work on sev-

eral research projects, some of which involve co-authors in Korea and Spain, and will spend about a month in each of these countries.

Thomas Kurtz will lead a year-long program on *Probability and Statistics in Complex Systems: Genomics, Networks, and Financial Engineering* at the Institute for Mathematics and its Applications (IMA) at the University of Minnesota.

Other people on non-sabbatical leave this year are:

Anatole Beck (spring semester, 2002-03) at the London School of Economics (England). **Yongbin Ruan** (academic year, 2002-03) at Hong Kong University of Science and Technology (Hong Kong).

James Propp (academic year, 2002-03) at Harvard University. **Thanos Tzavaras** (academic year, 2002-03) at the University of Crete (Greece).

Honors and Awards

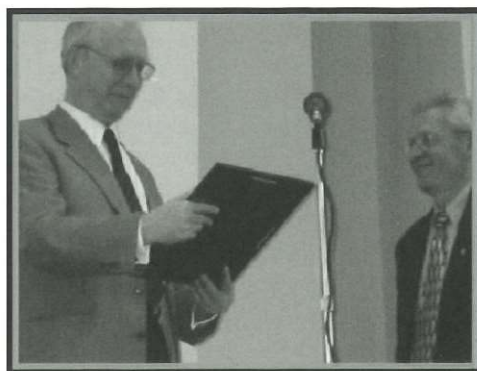
Carl de Boor receives Hildale Award and an Honorary Doctorate of Science from the Technion (Israel)

Carl de Boor, Chebyshev Professor of Mathematics and Computer Science and Steenbock Professor of Mathematical Sciences is the recipient of UW-Madison's Hildale Award in the Physical Sciences, given in recognition of distinguished contributions to teaching, research, and extension/outreach. Carl is a worldwide leader and authority in the theory and application of splines. Splines play a central role in computer-aided design and manufacturing, in the production of printers' typesets, in automated cartography, in applications of computer graphics (e.g., animation in movies), as well as in the general areas of signal and image processing.

Carl has written about 150 papers and five books. He is an excellent teacher and mentor, who has encouraged many young researchers during his 30-year career in Madison. He is a member of the National Academy of Sciences, a member of the American Academy of Arts and Sciences, the Leopoldina Academy in Germany, and a foreign member of the Polish Academy of Sciences.

In accepting the Hildale Award, he said: "I came to Madison almost thirty years ago, because this was the capital of splines, due to the fact that Iso Schoenberg had been active here since the early sixties. Iso Schoenberg is widely recognized as the father of splines; as he was kind enough to dub me his successor, this makes me, perhaps, the son of splines. I also came to Madison because of the superb and entirely unfettered working environment offered here at the Mathematics Research Center. True, that was barely two years after the bombing of MRC, but I join many other applied mathematicians, all over the world, in their gratitude, to this university and to the Army Research Office, for their strong support then of that first-rate center of research in applied mathematics. I am deeply honored by this Hildale award, and am very grateful for it, as I am for the many ways in which my departments, Mathematics and Computer Sciences, have helped me in my work, with special thanks to my colleagues in Computer Sciences for proposing, and my colleagues in Math for supporting, this award for me, and for many things besides."

Last summer Carl de Boor was awarded an Honorary Doctorate of Science from the Technion. The citation for this degree read in part: "In recognition of your outstanding contribution to approximation theory and numerical analysis and, in particular, for your developments in the theory of spline functions and their applications. Your work on spline theory produced essential mathematical ideas and algorithm tools used in a myriad of applications in science and technology." Carl had previously received an honorary doctorate from Purdue University.



Carl de Boor and Chancellor John Wiley

Alejandro Adem Wins Vilas Associates Award



Professor **Alejandro Adem**, who was our department chair from 1999 to 2002, has been named by the Graduate School as a Vilas Associate for 2003–05. This award provides summer salary support for two years and a flexible fund to be used for support of his research and other scholarly activities. Alejandro's research specialities are topology and algebra, and he is interested in such topics as cohomology of groups, sporadic simple groups, group actions, arithmetic groups, K-theory, and orbifolds.

Professor Adem joined our Mathematics Department in 1989, and previously received a NSF Young Investigator Award and a Romnes Faculty Fellowship from UW-Madison. In the last several years he has held visiting positions at the Hong Kong University of Science and Technology, University of Paris 13, and the Centre de Recerca Matematica in Barcelona, Spain. Alejandro has been the organizer of many meetings, most recently an ICM Satellite Conference on Stringy Manifolds, in Chengdu, China in August 2002, and an AMS-IMS-SIAM Joint Summer Research Conference on Groups, Representations and Cohomology in Mount Holyoke in June 2002. He was also the local organizer for the meeting of the AMS Central Section held in Madison last fall. With J. Aguade of the Universitat Autònoma de Barcelona and Eric Friedlander of Northwestern University, Alejandro is organizing a special session on Algebraic Topology at the first joint meeting between the American Mathematical Society and the Real Sociedad Matematica Española in Seville, Spain in the summer of this year.

Alejandro has given a great many invited lectures in the last ten years. A recent special lecture was one given on Finite Group Actions on Acyclic 2-complexes in the Bourbaki Seminar in Paris in 2001. He is coauthor (with R. J. Milgram) of the book *Cohomology of Finite Groups* published by Springer in 1994.

Alexandru Ionescu Wins Sloan Award

Professor **Alexandru Ionescu** has been named an Alfred P. Sloan Fellow for 2003–05. These extraordinarily competitive awards, which recognize past research accomplishments and future potential, are given only to the best young scientists in the country.

Alex studied as an undergraduate at MIT, and received the PhD from Princeton University in 1999. He was a member of the Institute for Advanced Study in Princeton and a C.L.E. Moore Instructor at MIT before joining our faculty as an assistant professor in 2000–01. In 1991, Alex was a gold medalist at the International Mathematics Olympiad.

Professor Ionescu's research interests lie in harmonic analysis, especially Carleman inequalities and unique continuation properties for Schrödinger operators with rough potentials. He is also interested in real-variable aspects of analysis on semisimple Lie groups and symmetric spaces, and in discrete methods applied in harmonic analysis. This past year Alex was an invited lecturer at the Oberwolfach meeting in Harmonic Analysis and the first joint international meeting between the American Mathematical Society and the Unione Matematica Italiana in Pisa, Italy. Also he was one of the organizers of the special section on harmonic analysis of the regional meeting of the American Mathematical Society held in Madison last year.



Faculty Dinner Honors Three Retirees



H. J. Keisler, D. Shea and
K. Strangman

Our annual faculty dinner was held on May 1, 2002 in the ninth floor lounge of Van Vleck Hall. Three recent retirees were recognized for their service to the department and the university. They are **Jerry Keisler**, **Dan Shea**, and **Kay Strangman**. Each of them has been awarded emeritus status, and from what we understand, is enjoying the independence that comes with retirement. Bob Turner also retired this past year but was out of the country at the time of the dinner. We hope to have an opportunity to honor Bob at the faculty dinner in May of this year. Also Steve Bauman has just retired (at the end of the fall semester of the 2002-03 academic year) and will also be honored this coming May. Read about Bob and Steve in next year's newsletter.

H. Jerome Keisler received the PhD from the University of California at Berkeley in 1961, where his advisor was Alfred Tarski. He spent 1961-62 at the Institute for Defense Analysis, and in 1962 came to Madison as an Assistant Professor. While at Wisconsin, he held visiting positions at the University of Colorado, the Institute for Advanced Study, the Institute for Defense Analysis, and the University of California at Los Angeles.

Jerry has been a prolific research mathematician writing over ninety research papers which contributed fundamental knowledge to model theory and related areas. His early papers from the 1960s are still widely cited as the seminal works in their subjects; his paper with Alfred Tarski has formed the basis for the modern theory of large cardinals.

His work from the 1970s to the present has made Jerry the world's leading authority on non-standard analysis. Jerry not only developed the theory but he also showed the importance of non-standard analysis to probability theory, mathematical economics, and stochastic differential equations. Jerry is also the author of a number of influential and acclaimed books on mathematics, with his graduate text in model theory and undergraduate text explaining calculus via infinitesimals, having been translated into a number of other languages.

There have been numerous recognitions of Jerry's research accomplishments: an Alfred P. Sloan Fellowship in 1966, a plenary lecture at the International Congress of Mathematicians in Nice in 1970, the AMS Colloquium Lecture Series in 1974, a Guggenheim Fellowship in 1976 and, on campus in 1982, the most prestigious professorship the university offers, a

William F. Vilas Professorship.

Mary Ellen Rudin and Ken Kunen recalled the central role that Jerry played for so many years within the logic group, teaching graduate courses and supervising doctoral dissertations. Jerry is the record-holder in the department with 34 mathematical children. It is expected that Jerry will hold this record for many years to come.

Daniel F. Shea received the PhD from Syracuse University in 1965 with a thesis in complex analysis supervised by Albert Edrei. He came to Madison right out of graduate school and spend his entire distinguished career here. Dan held visiting positions at a number of places including Purdue University (1970-71), California Institute of Technology (1974-75), University of Hawaii (1979), Technical University of Linköping (Sweden) (1981), and Universität Würzburg (Germany) (1991). Dan had 9 PhD students and over 50 publications on complex analysis, potential theory, and integral equations. Dan gave many invited talks during his career. He was invited and went to Oberwolfach five times, and he gave invited addresses at the annual meetings of the Swedish Mathematical Society three times.

In 1996 Dan volunteered to be the department's Undergraduate Advisor, a position he held until his retirement this past year. Dan worked very effectively in this demanding and very important position. His knowledge of the department and the university and his well-known and appreciated affability served him well in this position.

Knowing that Dan is an ardent opera fan and a leading figure in the international Jussi Bjoerling Society, Si Hellerstein, as part of his

speech about Dan, was moved to to write a synopsis for an "opera" to commemorate the occasion. He gave the title "Dan Sheaovanni" to this "opera." This scene captures Dan's joint love of mathematical analysis and opera. Here is the synopsis of one of the scenes:

Scene 2. In a lecture hall in Van Vlezzi sit some 200 instructees. Sheaovanni explains the strategy of integration. He pauses, stares at the blackboard, and begins the aria "Che bel integrale" – "What a beautiful integral." As he sings the aria, the instructees respond with the choral chant of "no comprendo, no capisco" – several times, rising in volume and drowning out Sheaovanni. A bell rings. The chorus rises and exits still chanting "no comprendo, no capisco." Sheaovanni remains. He gazes fondly at the board and again sings "Che bel integrale."

Kay Strangman studied at UW-Madison with majors in mathematics and mathematics education. She received a Masters degree in mathematics from the Illinois Institute of Technology. In 1967 Kay returned to Madison

to work at the UW-Madison R & D Center collaborating with Henry Van Engen on cognitive learning. According to Kay, it was during the two years she spent with Van Engen where she really learned to teach. Kay was a Lecturer in both the Mathematics and Computer Sciences Departments. From 1989 to 1999 she taught numerical analysis courses in the CS Department. She taught in the Mathematics Department from 1983 to 2002, primarily the three courses of our calculus sequence in the extended day program, but also our courses for future elementary teachers and our course on quantitative reasoning. In 2000, Ms. Strangman was awarded the title of Senior Lecturer. At the dinner, Claire Rider spoke of Kay's reputation as an excellent teacher who used computers and computer software (e.g., Mathematica and Excel) to advantage in the classroom. Kay has several interests outside of mathematics. She is the substitute organist at Bethel Lutheran Church and is an avid ice-skater. Currently, she is working on the silver testing level in ice-dancing.

Staff News

New Mathematics Librarian

Travis D. Warwick has been Head of the *Stephen Cole Kleene Mathematics Library* since December 2000. Travis received a B.S. in Mathematics from Albertyson College of Idaho in 1994, a Master of Science in Mathematics from the University of Idaho in 1997, and a Master of Library and Information Science from Louisiana State University in 1999. At the University of Idaho, he was a Teaching Assistant, then Lecturer, teaching precalculus, algebra, and finite mathematics. After graduating, his first job was as Science Reference Librarian - Assistant Professor at Illinois State University (ISU) where he taught a course in college algebra.



News From the Mathematics Library...

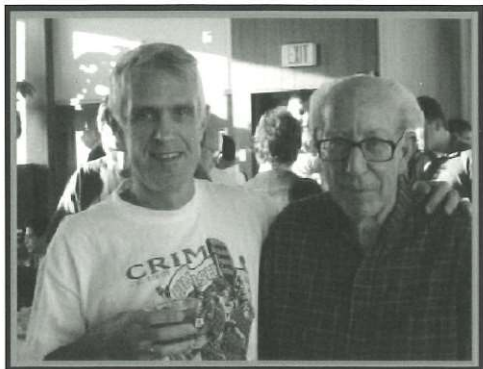
Despite our expected budget maladies, the General Library System continues to implement the new services that we've been working towards over the past few years. Most recently UW System Search, an extension of our campus-wide book retrieval service, is now active. UW System Search allows users to search and subsequently request books from any UW Institution. Since UW System Libraries already had their own mail system in place, these requests can be filled in 3-5 days, much faster than a typical interlibrary loan. A link to the new UW System Search database can be found on the menu bar at the top of a MadCat Search. Questions can be directed to any member of the library's staff.

Something to watch for in the Math Library, this May during intersession, the Library will close briefly for some minor remodeling. The Campus Space and Remodeling Policies Committee has approved a request for carpeting and some new paint. In addition to the new aesthetic appearance, we expect the carpet to go a long way towards creating a quieter environment for research. The exact dates for the library remodeling will be announced and posted as soon as they are known.

Contributed by Travis Warwick.

Special Lectures

7th Wolfgang Wasow Memorial Lecture



John Erik Fornaess and Walter Rudin

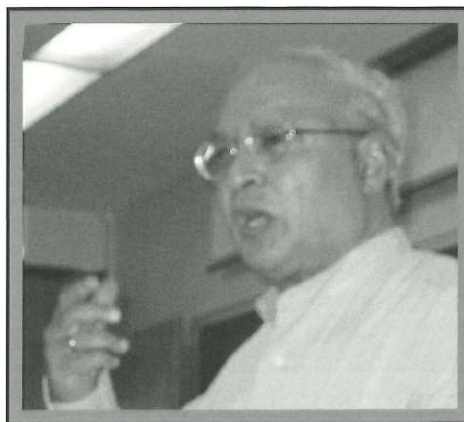
The 7th Wolfgang Wasow Memorial Lecture was given by **John Erik Fornaess** on October 11, 2002. Dr. Fornaess is Frederick W. Gehring Professor of Mathematics at the University of Michigan. He received the PhD from the University of Washington, Seattle, in 1974, under Lee Stout [PhD, 1964, W. Rudin] so he is a mathematical grandson of our Department. John Erik spent 16 years on the faculty at Princeton University before moving to the University of Michigan in 1991. The title of his talk was "The Nature of C^2 ." The abstract for his talk read as follows:

A simply connected domain in C is analytically equivalent to the unit disc, by the Riemann mapping theorem. The only exception is the whole plane. The situation in C^2 is much more complicated. It was already observed in the 1920s and 30s that there are subdomains of C^2 which are analytically equivalent to all of C^2 . These so-called Fatou Bieberbach domains are small enough that you can have two disjoint ones in C^2 . In fact, in the ground-breaking paper from 1988 by Rosay and Rudin they found infinitely many parallel ones. The space C^2 is thus more mysterious than one might think at first. This has become an interesting issue in complex dynamics. Stable manifolds of complex dimension two "ought to be" C^2 s. But are they?

Wolfgang Wasow was on our faculty for 23 years retiring as the Rudolf E. Langer Professor of Mathematics in 1980. A generous endowment established by his children is responsible for this series of Wolfgang Wasow Memorial Lectures.

7th Annual LAA Lecture

Professor **Thomas Kailath** of the Department of Electrical Engineering of Stanford University gave the *Seventh Annual LAA Lecture* on April 26, 2002. The title of his lecture was "Displacement Structure: From Theory to Application." Professor Kailath has worked in a number of areas including information theory, communications, computation, control, signal processing, VLSI design, statistics, linear algebra and operator theory; his recent interests include applications to problems in semiconductor manufacturing. He has held Guggenheim and Churchill fellowships, among others, and received outstanding paper prizes from the IEEE Information Theory Society, the American Control Council, the European Signal Processing Society, the IEEE Signal Processing Society and the IEEE Transactions on Semiconductor Manufacturing. He holds honorary doctorates from Linköping University, Sweden, Strathclyde University, Scotland, and the University of Carlos III, Madrid, Spain. He has had



over 70 PhD students at Stanford University and more than 40 postdocs and research scholars. Dr. Kailath is a member of the National Academies of Science and of Engineering, and the American Academy of Arts and Sciences.

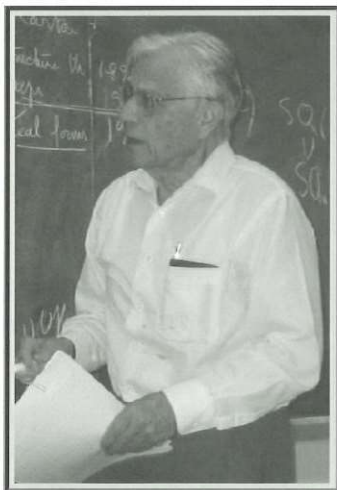
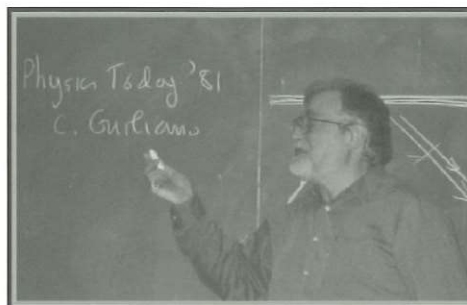
In his talk, Professor Kailath related how the presence of special structure, and its exploitation, occupies engineers and applied mathematicians in fields where standard algorithms (like Gaussian elimination) are well known. The concept of displacement structure is a uniform and powerful way of capturing and exploiting both explicit (like Toeplitz structure) and implicit structure in matrix and operator theory.

Distinguished Lecturers

Spring Series 2002

Professor **George Papanicolaou**, Robert Grimmer Professor of Mathematics at Stanford University, visited during the week of April 22, 2002. Professor Papanicolaou has had a great influence on applied mathematicians through his research, PhD students, and postdoctoral fellows. He has developed and applied stochastic techniques to significantly advance our understanding of physical, biological, economic and other phenomena. His contributions to science have been recognized by election to the National Academy of Sciences and the National Academy of Arts and Sciences.

While in Madison, Professor Papanicolaou gave three lectures with title: "Time Reversal, Imaging and Communications in Random Media." The first was to the Applied Math/PhD Seminar which had subtitle "Mathematical Analysis." The second was a general colloquium. The final talk was to the Graduate Seminar and it had subtitle "Communication Applications."



Professor **Armand Borel** of the Institute for Advanced Study in Princeton gave another series of distinguished lectures. He visited the department during the week of May 6, 2002 and gave two lectures. The first was to the Lie Theory Seminar on "Moduli Spaces for Flat Bundles over Two and Three Dimensional Tori." The second was a fascinating talk on "The Scientific Relations between Élie Cartan and Hermann Weyl, 1922-1930." Dr. Borel is the author of the book on the history of Lie groups *Essays in the History of Lie Groups and Algebraic Groups*, (History of Mathematics, 21. American Mathematical Society, Providence, RI; London Mathematical Society, Cambridge, 2001). A recent article by Borel on E. Cartan and H. Weyl is "Élie Cartan, Hermann Weyl et les connexions projectives" in *Essays on geometry and related topics*, Vol. 1, 2, 43-58, Monogr. Enseign. Math., 38, Enseignement Math., Geneva, 2001.

Professor Borel was born in Switzerland, and did his undergraduate work at the Federal School of Technology (ETH) in Zürich. He obtained his doctorate degree at the University of

Paris in 1952. He has been a professor at the Institute for Advanced Study since 1957.

Fall Series 2002

Our *Distinguished Lecturer* this past fall was **Alex Wilkie** from the Mathematical Institute of the University of Oxford. He visited the Mathematics Department during the week of September 30, 2002. Dr. Wilkie gave a series of three lectures on the topic of o -minimality and its applications. The titles of his lectures were: "Diophantine Properties of o -minimal Structures", " o -minimality", and "Vapnik-Cervonenkis classes and o -minimal structures." The middle lecture was a department colloquium. Dr. Wilkie put it this way: "Tarski's famous elimination theorem for the ordered field of real numbers is rather special to the algebraic structure on the reals and does not generalize easily when one wishes to consider further functions (e.g., analytic functions). However, one simple consequence of the elimination theorem, the o -minimality property, does generalize and seems to be sufficient to establish, on a formal axiomatic basis, most qualitative topological and geometrical finiteness properties enjoyed by the algebraic sets. I shall discuss this formal theory and give examples. I shall conclude with a result about algebraic sets that might not have been seen were it not for this more general viewpoint."



The Wasow Memorial and LAA Lectures for 2003 have now been chosen. *Peter Sarnak* (Princeton University and New York University) will give his LAA Lecture on October 17 of this year. *Nancy Kopell* (Boston University) will give her Wasow Memorial Lecture on November 12 of this year.

Conference News

Central Section of AMS Meets in Madison

The Department of Mathematics at the University of Wisconsin-Madison hosted the Fall Meeting of the Central Section of the American Mathematical Society on October 12 & 13, 2002. Approximately 400 mathematicians from 34 states and 16 countries gathered for this meeting.

Madison faculty were very active in organizing special sessions, and we hosted high quality sessions in the following areas:

Arithmetic Algebraic Geometry	Several Complex Variables
Partial Differential Equations and Geometry	Harmonic Analysis
Group Cohomology and Homotopy Theory	Arrangements of Hyperplanes
Lie Theory and Differential Equations	Ring Theory and Related Topics
Effectiveness Questions in Model Theory	Dynamical Systems
Lie Algebras and Related Topics	Probability
Hyperbolic Differential Equations and Kinetic Theory	Biological Computation and Learning in Intelligent Systems

There were also four plenary addresses, most notably our colleague Eleny Ionel delivered a beautiful lecture on the topic of 'Relations between Gromov-Witten Invariants'.

According to Susan Friedlander, AMS Associate Secretary, our meeting was extremely successful, with a level of participation rarely seen at a sectional meeting. Participants were particularly pleased with the reception offered at the Tripp Commons in the UW Memorial Union, on the first day of the conference.

As usual, Math Department staff provided crucial help in running this large meeting, in particular Peggy Conklin did a magnificent job as a local coordinator, receiving rave reviews from the folks at AMS. Vicky Whelan and Diane Reppert also provided much needed help.

Contributed by Alejandro Adem (local organizer).

Student and Instructional News

Talent Search Honors Day

This past year was the 38th anniversary of our statewide, high school Mathematics Talent Search. This program, which began in 1963, is supported by the College of Engineering, Tau Beta Pi Engineering Honor Society, the Cray Research Foundation, and the Van Vleck estate. The annual Honors Day was held on May 9, 2002. Seventeen students were honored for their achievement on the Talent Search Problems. Four of the students were from Madison West High School; three of the students were from Madison Memorial High School. Two of the students were sons of Michael Wage [PhD 1976, M. Rudin]. The \$24,000 Van Vleck Scholarships to attend UW-Madison this year went to Jesse Beder of Shorewood High School and Po-Ling Loh of Madison Memorial High School.

As usual there was a stimulating program for these talented students. Professor Ken Ono gave a talk on "Points on Curves" while Dr. Sanjay Limaye gave a presentation on "Quest for Life on Mars." After lunch and the presentations, the students, their parents, and their teachers were given a tour of the Space Sciences & Engineering Building.

Present at the festivities was Qi Su, who graduated this past summer in the Computer Engineering Program of the College of Engineering. Qi Su is the first Van Vleck scholarship winner graduate. He is now a graduate student at Stanford University having won an NSF Graduate Research Fellowship.

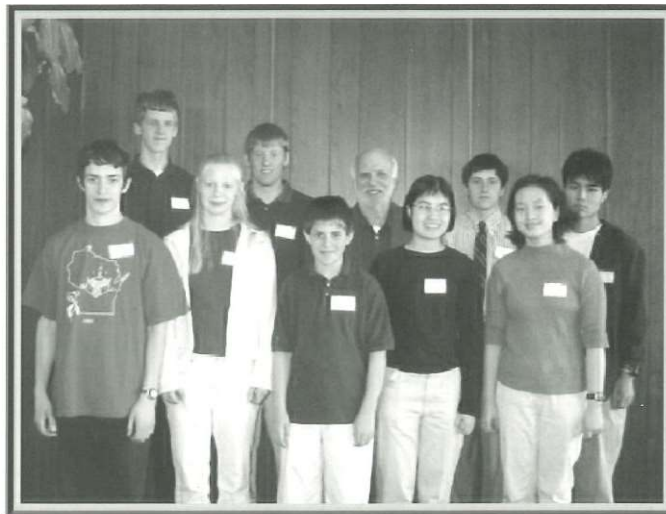
As usual the creative problem makers were Marty Isaacs and Don Passman. Three of the problems from this year's collection are:

1. For any positive integer n , let $S(n)$ denote the sum of its digits. Show the the equation $n + S(n) = 1,000,000$ has no solution. Then solve the equation for $n + S(n) = 1,000,000,000$.
2. Let x and y be nonzero real numbers satisfying the equation

$$x + \frac{6}{x} = 2y + \frac{3}{y}.$$

If $x/y \neq 2$, find the product xy .

3. (New Year's Problem) Find the number of nonnegative integers n such that $2003+n$ is a multiple of $n+1$.



Don Passman and Talented Students

Undergraduate

Two Madison High School Students Bring Home Gold

Daniel Kane, a student at Madison West High School, and **Po-Ru Loh**, a student at Madison Memorial High School were among 510 students who participated in the 43rd International Mathematical Olympiad in Glasgow, Scotland this past summer. There were 85 teams consisting of six students each. Remarkably, both Daniel and Po-Ru won gold medals, two of the four gold medals won by the U.S. team, which finished in third place beyond China and Russia. The gold medals were slipped over their heads by Princess Anne of Great Britain. Both Daniel and Po-Ru earned perfect scores at the U.S. Mathematics Olympiad in Boston last year; only five out of 326 participants did so.

Neither Daniel nor Po-Ru are strangers in the UW-Madison Mathematics Department, as they have taken many undergraduate mathematics courses here. Daniel is the son of mathematics professor Jonathan Kane [PhD 1980, A. Nagel] of UW-Whitewater and oncology professor Janet Mertz of UW-Madison. Po-Ru is the son of statistics professor Wei-Yin Loh of UW-Madison; his mother, Theresa Loh, has a mathematics degree from the University of Singapore.

Recently, Daniel has been conducting research with Ken Ono in Number Theory, and he has already written two research papers. The first paper on asymptotic formulas for partition functions has been accepted for publication in the Ramanujan Journal. His second paper is even far more impressive. Daniel proves a conjecture of George E. Andrews and Richard Lewis on crank inequalities. This second paper employs the theory of theta functions, the circle method for automorphic forms, and a wide variety of complicated combinatorial constructions. He has just submitted the paper for publication - and he is only 16 years old!

Undergraduate Scholarship Awards

Our annual student awards ceremony was held on May 7, 2002 in the ninth floor conference room of Van Vleck Hall. Awards were presented to several of our best undergraduate students:

Named Scholarship	Award Recipient
R. Creighton Buck Prize for Creativity in Mathematics	Geir T. Helleloid
Mark Ingraham Scholarship	Jonah B. Gaster Kendra Nelsen Anne J. Shudy
Frank D. Cady Scholarship	Adam T. Feldman William C. Hogg Abraham D. Smith
Irma L. Newman Scholarship	Scott M. Schneider
Prof. Linnaeus Wayland Dowland Scholarship	Sang-Hoon Cho Nathan Corwin James R. Diebel Mathew D. Felton

AMEP Program Receives Gifts from Alumnus Dan Koellen

The Applied Mathematics Engineering and Physics (AMEP) undergraduate program has received generous gifts from alumnus Dan Koellen. One gift is a "Leadership Fund" endowment, creating an award for AMEP students who excel academically and have a broader impact on the program. The second gift is earmarked for expenses related to attracting more students to the program, increasing the visibility of AMEP, and improving the cohesion of the program. To this end, Professor Paul Milewski, the current coordinator of AMEP, is organizing social get-togethers and a seminar course for AMEP students that will focus on in-depth discussion of various physically relevant problems.

Sidewalk Math

Need help studying for exams? That's how the flyer advertising Sidewalk Math began last spring. It went on to say: Friendly teaching assistants will be on hand to answer your questions in a relaxed atmosphere. It'll be like Math Lab – OUTDOORS.

Every spring many of our teaching assistants volunteer their time to help students prepare for mathematics exams. And many of our students in such courses as College Algebra and Calculus take advantage of the offered help. Afterwards the teaching assistants have the different, and not voluntary, task of grading all those exams with faculty members. This contrast is evident in the before and after pictures below.



Sidewalk Math in progress...



...Finally grading exams

Please visit our website for current events,
this newsletter and other information on our programs.

<http://www.math.wisc.edu>

Graduate

Twelve PhDs Awarded in 2002

There were twelve PhDs awarded in calendar year 2002. With their thesis advisor, current address, and thesis title, they are:

Gautam Bharali (Advisor, A. Nagel), Assistant Professor of Mathematics, University of Michigan, Ann Arbor, MI, *On smooth peak-interpolation sets for weakly pseudo-convex domains.*

Matthew M. Bloss (Advisor, G. Benkart), Mathematics Department, St. Olaf College, Northfield, MN, *Partition algebras and permutation representations of wreath products.*

Matthew G. Boylan (Advisor, K. Ono), VIGRE Postdoctoral Fellow, Department of Mathematics, University of Illinois, Urbana, IL, *Congruences for the Fourier coefficients of modular forms with applications.*

Timothy J. Cookson (Advisor, A. Miller), Fields Institute for Research in Mathematical Sciences, Toronto, Ontario, Canada, *Independence from cardinal arithmetic and random $\times$ random forcing.*

Jorge Garcia (Advisor, T. Kurtz), Visiting Assistant Professor, Department of Mathematics, California Lutheran University, Thousand Oaks, CA, *A large deviation principle for stochastic integrals.*

Kenneth L. Gerber (Advisor, R. Brualdi), Actuarial Analyst, Trustmark Insurance, 400 Field Dr, Lake Forest, IL, *On the chromatic sum, strength, and weakness of graphs.*

James E. Hamblin (Advisor, M. Isaacs), Assistant Professor of Mathematics, Shippensburg University, Shippensburg, PA, *On solvable groups satisfying the two-prime hypothesis.*

Seok Hwang (Advisor A. Tzavaras), Assistant Professor of Mathematics, University of Southern California, Los Angeles, CA, *Kinetic decomposition of approximate solutions to conservation laws.*

Xiantao Li (Advisor, S. Jin), Program In Applied & Computational Mathematics, Princeton University, Princeton, NJ, *Computation of the semiclassical limits of the Schrodinger equation and related problems.*

Mohsen Mazaheri (Advisor, T. Zariphopoulou), Goldman Sachs & Co., 85 Broad St, New York, NY, *Valuation and robustness in stochastic volatility environments.*

Bernardo Uribe (Advisor, A. Adem), Max Planck Institute, Bonn, Germany (until 7/1/03), (then) Postdoctoral Fellow, University of Michigan, Ann Arbor, MI, *Twisted K -theory and orbifold cohomology of the symmetric product.*

Chan Woo Yang (Advisor, A. Seeger), Department of Mathematics, Johns Hopkins University, Baltimore, MD, *L^p estimates for some classes of Radon transforms and oscillatory integral operators.*

Our graduate students who expect to be awarded a PhD this year are getting many good offers. For instance, **Emre Alkan** has accepted a 3-year position as J. Doob Research Assistant Professor at the University of Illinois at Urbana-Champaign, and **Eric Mortenson** has accepted a 3-year position as S. Chowla Research Assistant Professor at Penn State University. Both Emre and Eric are students of Ken Ono in number theory and will be going to universities which have strong number theory programs. **Cheol-Hyun Cho**, a student of Yong-Geun Oh, has accepted a 3-year postdoctoral position at Northwestern University, one of two postdocs for their special 2003-04 program on Geometry and Topology of String Theory.

New Graduate Students in Fall 2002

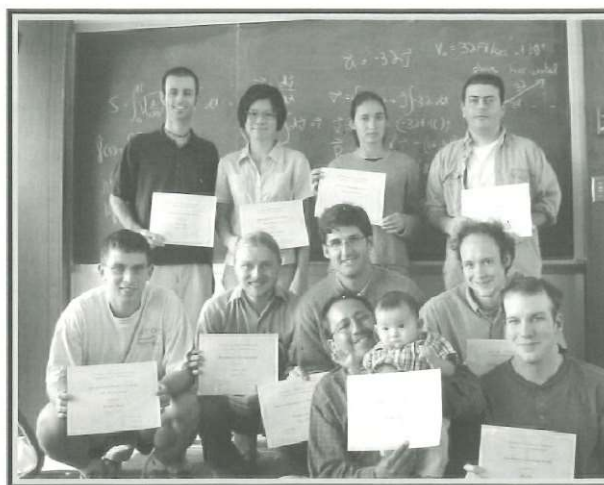
We had a bumper incoming graduate class this past fall. Thirty-three graduate students in mathematics enrolled for the first time in our department. Their names and undergraduate institutions are listed below.

BERLINER, Adam	Carleton College
BOSTELMANN, Ulrike	Technical University of Clausthal
BOWMAN, John	Wake Forest University
CHRISTODOULOPOULOU, Konstantina	University of Athens
DEAETT, Louis	University of Rochester
EHART, Nicholas	University of Michigan
ELLISON, Benjamin	Case Western Reserve University
FANG, Ye	Peking University
GALINDO, Diego	McGill University
HART, Elizabeth	Portland State University
HOLDEN, Christopher	University of New Mexico
JENKINS, Paul	Brigham Young University
KANE, Benjamin	Carnegie-Mellon University
KANG, Hye Won	Yonsei University
LANIG, Jeremy	University of Oregon
LI, Qian	Nankai University
LIN, Liming	City University of Hong Kong
LOSKAMP, Marco	Technical University of Clausthal
MARSH, Ben	University Kansas
MC GINN, Daniel	Carleton College
MILLER, Nathan	University of California-Santa Cruz
MUELLER, Stefan	University of Bonn
OBERLIN, Richard	Florida State University
OTTO, Benjamin	Bowling Green State University
REMMEL, Mark	University of Wisconsin-Madison
ROSE, Michael	Ohio State University
SENGUN, Mehmet Haluk	Istanbul Bilgi University
SINHA, Ritwik	Indian Statistical Institute
TONEJC, Jernej	University of Ljubljana
WANG, Jiayou	Shanghai Jiaotong University
WANG, Liang	Zhejiang University
WEBER, Brian	Virginia Polytechnic Institute
WIBOONTON, Keng	Chulalongkorn University

There are many countries represented by this new class: Germany, Greece, China, Canada, Turkey, India, Slovenia, and Thailand.

Department Awards to Graduate Students

Our annual student awards ceremony was held in May 2002. Six graduate students were honored with Teaching Awards for their work as Teaching Assistants. They were **Emre Alkan**, **Joshua Davis**, **Rob Ely**, **Jorge Garcia**, **Neil Lyall**, and **Scott Trigg**. Two graduate students, **Gautam Bharali** and **Joaquin Cotrina**, were singled out for Sustained Teaching Awards. **Andrew Raich** was given a Sustained Excellence in Teaching Award & Service.



Top Left: Trigg, Nguyen, Vasquez, Alkan
Bottom Left: Raich, Lyall, Cotrina, Garcia (& son), Davis, Ely

Berit Nilsen wins Campus Capstone TA Award

A 2002 campus-wide Capstone PhD Teaching Assistant Award has been awarded to **Berit Givens Nilsen**. These awards recognize PhD students who have performed as outstanding teaching assistants throughout their UW-Madison tenure.

Ms. Nilsen has been an important contributor to the department's teaching mission. She has done the usual TA-ing in calculus courses, has taught a "satellite" section of calculus, has been a TA coordinator working with new teaching assistants, has worked with new international teaching assistants, has worked with Steve Bauman in the Bradley Learning Community teaching residence-based calculus, has taught in the Wisconsin Emerging Scholars Program, has done important work in training TAs in the department, and has been an L&S Teaching Fellow. Berit has won every award our department gives to TAs! This Capstone award highlights Berit's teaching career at Wisconsin. She will be receiving the PhD this year and will be a valuable asset to any department lucky enough to attract her.

Comments from students in her classes included: "Berit is an awesome TA. She is helpful and cares how we do in class", "I am so impressed with Berit's teaching skills; she really understands the material, is enthusiastic about math and devotes a lot of her time to make sure everyone understands the course", and "I love coming to my calc discussion! Berit is so enthusiastic about teaching, she loves it and it shows."



Joaquin Cotrina named L&S Teaching Fellow



For 2002 **Joaquin Cotrina** was chosen to be an L&S Teaching Fellow. This program honors Teaching Assistants in the College who have excelled in teaching performance and who have contributed to the College's teaching mission in important ways. Fellows are awarded a \$500 stipend and organize a workshop for incoming TAs in the College. Joaquin is a student of Pat Ahern working on complex variables.

Elizabeth S. Hirschfelder Award to Three Graduate Women

This past year's recipients in the Mathematics Department of *The Elizabeth S. Hirschfelder Award* for Graduate Women are **Jennifer Halfpap**, **Xuan Hien Nguyen**, **Elisa Vasquez**. These scholarships are made possible by generous contributions of Elizabeth S. Hirschfelder [PhD 1930, M. Ingraham]. We are sad to report that Dr. Hirschfelder died recently (see the obituary section of this newsletter).



Jennifer Halfpap, a 1996 graduate of Ripon College is working on a thesis problem in analysis with Alex Nagel. She is interested in describing the regions to which CR functions defined on CR submanifolds can be extended as holomorphic functions. Currently she is considering this problem for a class of manifolds that can be approximated by certain model manifolds.

Xuan Hien Nguyen, a 2000 graduate of the Free University of Brussels is working with Sigurd Angenent studying the Dirichlet and Plateau problem for surfaces of prescribed mean curvature.



Elisa Vasquez, a 1999 graduate of Universidad de los Andes, Bogota, Colombia is working with Patrick Speissegger on applications of the Crofton's formula to ϕ -minimal expansion of the reals. For instance, they have obtained a bound on the length of definable curves inside the unit square.

Other News

Alejandro Adem has been appointed to the Scientific Advisory Committee of the Mathematical Sciences Research Institute (Berkeley).

Richard A. Brualdi has been elected to a three-year term on the Editorial Boards Committee of the *American Mathematical Society*. With Rajendra Bhatia of the Indian Statistical Institute, he is organizing a 10 hour special session on "The Many Facets of Linear Algebra and Matrix Theory" at the first joint meeting of the American Mathematical Society (AMS) and Indian mathematicians, to take place in Bangalore, India on December 17-20, 2003.

The Walter Rudin Student Series in Advanced Mathematics has been announced by the Mathematics & Statistics Publishing Group of McGraw-Hill Higher Education. The editor-in-chief of this new textbook series is Steven G. Krantz of Washington University in St. Louis.

Timo Seppäläinen received the prize "Prix Institut Henri-Poincaré/Gauthier-Villars" for the best paper in the Probabilités and Statistiques series of the journal *Annales de l'Institut Henri Poincaré* published in the year 2000. The title of his paper is: "Strong Law of Large Numbers for the Interface in Ballistic Deposition." The prize included a medal and 1500 euros. The award ceremony took place at the Institute in June 2002, and included presentations by the recipients for the different series, along with a champagne reception and a fancy dinner. Timo also gave an invited plenary lecture at NORDSTAT 2002, the 19th Nordic Conference on Mathematical Statistics in June, 2002.

Marshall Slemrod will spend two months (May/June 2003) at the Isaac Newton Mathematics Institute in Cambridge, participating in the special program on Non-linear Hyperbolic PDE's.

Alex Nagel has been appointed to the editorial board of the *Transactions of the American Mathematical Society*.

Peter Orlik is one of the organizers of the Fall 2004 program on *Hyperplane Arrangements and Applications* at the Mathematical Sciences Research Institute (Berkeley).

Arun Ram has been appointed as an editor-in-chief of the *Journal of Algebraic Combinatorics* and as an advisory editor of the *Journal of Combinatorial Theory, Series A*.

Jeremy Lovejoy, a VIGRE Van Vleck Assistant Professor, who spent the 2001-02 academic year at the University of Paris VII on a prestigious Chateaubriand Fellowship, has received a permanent 100% research CNRS position in France. These are highly competitive positions, and it is very unusual for a non-French citizen to be offered one. Jeremy is teaching a graduate course on partitions and q -series this semester. He received the PhD at Penn State University in 2000 where he was supervised by George Andrews and Ken Ono.

Ken Ono gave an invited lecture in November 2002 at the Beckman Institute of the US National Academy of Science as part of the 2002 Chinese-American Frontiers of Science Symposium. He has selected to be the principal lecturer for an NSF-CBMS (Conference Board of the Mathematical Sciences) Conference. The conference, entitled 'The Web Modularity', will be held at the University of Illinois in Urbana in June 2003. As the principal lecturer, Ken will be delivering 10 lectures on modular forms and will also be writing a book in the American Mathematical Society's CBMS Monograph Series. Present or emeriti UW Madison faculty who have been CBMS lecturers include Walter Rudin, Mary Ellen Rudin, Richard Askey, Peter Orlik, Donald Passman, and Paul Rabinowitz. In addition, Ken will be giving the Milton Brockett Porter Lectures (four lectures) at Rice University in Houston, Texas in March 2003. Previous Porter

Lecturers include S.T. Yau, Arthur Jaffe, Peter Sarnak, Michael Atiyah, and Janos Kollar.

Georgia Benkart, as the MAA (Mathematical Association of America) Pólya Lecturer for the years 2000-02 (see Van Vleck Notes 2001), gave lectures at MAA sectional meetings in New York, Illinois, Kentucky, Wisconsin, and Nebraska-South Dakota. She also gave a joint MAA-AMS invited hour talk at recent annual meetings in Atlanta, Georgia.

James Propp gave an invited lecture at a conference on Combinatorics and Solvable Lattice Models held in July, 2002 at the Australian National University in Canberra. The conference was in Australia, but Jim gave the talk via phone-link, and with computer support, from his kitchen in Cambridge, Massachusetts! Jim will be giving an invited lecture at a conference on Number Theory and Combinatorics in Physics in March, 2003 at the University of Florida, Gainesville. After a two year absence, Jim is looking forward to returning to Madison (and we are looking forward to having him back among us).

Robert Turner is in Pisa this winter. As part of the program at the Scuola Normale he is giving a month-long course "An Introduction to Neural Dynamics." The aim of this short course is "to acquaint the listener with the ionic basis for voltage variations in single neurons and to discuss models of small numbers of interconnected neurons."

Larry Farnsworth who has worked in our financial office as Grants and Contracts Coordinator for many years has resigned his position in order to assume a similar position in the Zoology Department. On November 1, 2002, Larry was presented with a "good luck" gift in recognition of his important service to the department. There was a cake in the financial office with faculty invited to stop by and give good wishes to Larry.

Alumni News and Comments

<http://math.wisc.edu/directories/alumni.html>

Mark McKinzie [PhD 2000, M. Bleicher] and **Curtis Tuckey** [PhD 1991, J. Keisler] received the Carl B. Allendorfer Award from the MAA at its MathFest in Burlington this past summer. The award, consisting of a citation and a cash prize, is presented for articles of expository excellence published in the *Mathematics Magazine*. Their article "Higher Trigonometry, Hyperreal Numbers, and Euler's Analysis of Infinities" was published in volume 74 (2001), pages 339-368. The award citation read in part: "They describe a modern context, replete with infinite and infinitesimal numbers, in which Euler's methods can be made intelligible, rigorous, and useful to modern readers - namely, the system of hyperreal numbers as described in Keisler's textbook 'Calculus: An Infinitesimal Approach'. In a *tour-de-force* of expository clarity, they describe this system and use it to show how a large number of Euler's manipulations can be turned into rigorous proofs." Mark is at Monroe Community College in Rochester, NY; Curt is at Voice Laboratory, Oracle Corporation in the Chicago area.

John Goldwasser [PhD 1983, R. Brualdi] has been promoted to (full) professor at West Virginia University.

Chung-Chun Yang [PhD 1969, S. Hellerstein] is at the Hong Kong University of Science & Technology, Hong Kong. He is Vice President of ISAAC (International Society for Analysis, Its Applications and Computation), series editor of the newly established book series "Advances in Complex Analysis and Its Applications," Kluwer Academic Publishers, and series editor of the book series: "Asian Math. Series," Taylor and Francis.

Jennifer Quinn [PhD 1993, R. Brualdi] is now Chair of the Department of Mathematics of Occidental College. She was recently named co-editor (with Arthur Benjamin) of the MAA's publication *New Horizons*.

Mirna Dzamonja [PhD 1993, K. Kunen] of the University of East Anglia (England)

has been awarded an Advanced Fellowship from the British Science Foundation (EPSRC). EPSRC is an award for scientists below 35 that allows the recipient to spend five years teaching free. She started her fellowship in February 2002 and spent the semester at various universities (University of Paris, Carnegie Mellon University, and the University of Helsinki). Mirna says that it is "really excellent to be able to have all this time for research only."

Matthew Boylan [PhD 2002, K. Ono], a former Wisconsin undergraduate and NSF VIGRE fellow has a joint paper with Scott Ahlgren (U. Illinois, Urbana) which has been accepted for publication in *Inventiones Mathematicae*. The joint work has its origins in Matt's Wisconsin thesis, and is indeed a wonderful accomplishment for a new PhD. Matt is presently in his first year as a VIGRE Assistant Professor at the University of Illinois in Urbana-Champaign.

Ahmad Muchlis [PhD 1991, H. Schneider] of ITB in Bandung, Indonesia wrote to say how much the newsletter reminds him of the years he spent in Madison. He mentions that he persuaded a talented student, Hendrata Dharmawan Sie, a silver medalist at the International Mathematical Olympiad held in Washington to pursue mathematics study at Madison. Dharmawan Sie is currently an undergraduate honors mathematics major.

Mark Wilson [PhD 1995, D. Passman] and **Golbon Zakeri** [PhD 1995, R. Meyer (CS)] are now tenured faculty members at Auckland University (New Zealand) with Mark in the Computer Science Department and Golbon in the Engineering Science Department. They write that **Geoff Pritchard** [PhD 1995, J. Kuelbs] and **Shayne Waldron** [PhD 1995, C. de Boer] are also at Auckland University (1995 was a good year for New Zealand!), and that **Shaun Cooper** [PhD 1996, R. Askey] is just a few kilometers away at another

university. One of Mark and Golbon's proud accomplishments is a recent baby who was announced by Mark with: After writing two papers together Golbon Zakeri and I have produced our greatest joint work. There are more Madison connections: Mark is currently working on a project with former Madison faculty member **Robin Pemantle** (now at Ohio State University). **James Goodman** of the Madison Computer Science Department has taken a position in the Computer Science Department at Auckland, as has **Andre Nies** a former Madison visitor. They also report that the Auckland Mathematics Department is to host a new government-funded research institute (www.nzima.auckland.ac.nz) which will hold thematic programmes every 6 months, and encourage friends and colleagues from Madison to come and visit.

Joe Malkevitch [PhD 1968, D. Crowe] now writes the Feature Column on the AMS website. This column, part of *What's New in Mathematics*, contains a series of monthly essays on topics intended for a broad audience.

Argimiro A. Arratia [PhD 1997, D. Joseph] who, as we reported last year, is editor of the Bulletin of the Venezuelan Mathematics Society, has written to say that one can access the Bulletin on the web for free at its mirror site in the USA:

http://www.math.temple.edu/~gmendoza/boletin_amv/

He also encourages residents at Van Vleck Hall to consider publishing in this Bulletin.

A correction: Last year we reported on the MAA MathFest held in Madison, in particular on the 25 year dinner. We said, according to the program prepared for the dinner by the MAA, that **Robert L. Wilson** [PhD 1947, C. C. MacDuffee] was recognized for his 41 years as an MAA member. Well, it seems that the MAA mixed up father and son. At that time, Robert L. Wilson Jr., current UW-Madison faculty member, had been an MAA member for 41 years; Robert L. Wilson Sr. had been a member for 55 years.

Address Correction and Alumni News

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Death Notices

On September 20, 2002 **Elizabeth Stafford Hirschfelder** [PhD 1930, M. Ingraham] died at the age of 100. Betty, as she was affectionately known, received BA and MA degrees from the Women's College of Brown University, now Pembroke College, in 1923 and 1924. There were three PhD graduates in mathematics in 1930 when she received her PhD from the University of Wisconsin, and these were the 18th, 19th, and 20th Wisconsin PhD degrees in mathematics, whose number is now nearing 1000. Betty participated in the Wisconsin Mathematics PhD Centennial in 1997 and was the earliest Wisconsin PhD present at the celebration, having held her Wisconsin PhD for 67 years at that time. The title of Dr. Hirschfelder's thesis was "Matrices conjugate to a given matrix with respect to its minimum equation." She taught mathematics at Wisconsin for almost 20 years. With her first husband, Ivan Sokolnikoff, she co-authored in 1934 the important textbook "Higher Mathematics for Engineers and Physicists." In 1997 she started the Elizabeth S. Hirschfelder Fund for Graduate Women in Mathematics, Chemistry, and Physics at the UW-Foundation.



Alan Schwartz [PhD 1968, W. Rudin] died on January 2, 2003. Alan was a Professor of Mathematics at the University of Missouri, St. Louis. He took an early retirement last year because of a long illness and moved to Washington, DC to be near his children and grandchildren. Alan's thesis at Wisconsin was titled "Local properties of Hankel transforms." He was the author or coauthor of approximately 50 papers.

Herman F. Karreman died on January 9, 1999 in Dodgeville Wisconsin. Professor Karreman joined the Mathematics Research Center in 1963. He was a tenured member of both the School of Business and the Department of Industrial Engineering, teaching courses in operations research and mathematical analysis. Dr. Karreman was born in 1913 in the Netherlands and served in the Dutch Armed Forces in Indonesia during World War II. He and his family were held in several prison camps for three and a half years. After the war he resumed his studies and received a doctorate in 1949 in econometrics from the University of Rotterdam. In 1960 he received the Lanchester Prize (an annual award for the best contribution to operations research and the management sciences published in English) for his paper "Programming the supply of a strategic material - Part I. A nonstochastic model," *Naval Research Logistics Quarterly*, 7 (1960), 261-279.

Etta Falconer, Professor of Mathematics at Spelman College, died on September 19, 2002. Professor Falconer held an undergraduate degree in mathematics from UW-Madison and was awarded an honorary doctorate by our university in 1996. She spent 37 years at Spelman where she was Associate Provost for Science Programs and Policy, and Fuller E. Calloway Professor of Mathematics. In 1995 the Association for Women in Mathematics (AWM) awarded Dr. Falconer their Louise Hay Award for Contributions to Mathematics Education. In 2002 Professor Falconer received the AAAS Mentor Award for Lifetime Achievement.

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