



Department of Mathematics
University of Wisconsin

Van Vleck Notes 2002



From the Editor...

The Department of Mathematics is completing the third year of its VIGRE Program and underwent a very successful site review by NSF Division of Mathematical Sciences program directors and an external reviewer last October. This means that we will receive support of \$1 million from NSF for the years 2002–04 bringing the total support to \$2.5 million for the years 1999–2004. This money has been crucial for support of research and other scholarly activities by undergraduates, for recruiting top students to our graduate program and for allowing current graduate students to concentrate on their academic work (in particular, research for theses), and for attracting some of the best new mathematics PhDs to Madison for postdoctoral work. We have been very successful in all three of these categories.

Last fall VIGRE postdoc Dan Knopf organized a Minimal Surfaces Lab for undergraduates. According to Dan, “the primary goal of this Lab is to help participants learn how to do research. The students who take part will have the opportunity to work in a collaborative setting, develop their creativity, learn how to communicate problems and results to others, and learn how to use computing and library resources effectively.” This was a great learning experience for our undergraduate math majors. VIGRE postdocs Rebecca Field and Chris Raymond assisted and helped mentor students, with Chris providing an

applied math viewpoint to abstract problems. More than a dozen students participated in the Lab. Next year we plan an undergraduate research lab in a topic yet to be chosen.

Our VIGRE seminar this academic year was divided into two parts. In the fall semester we had weekly talks by current faculty who were asked to describe their research area in a way that was understandable to non-experts. The purpose was to introduce first and second year graduate students to the research directions of our faculty, as a way of helping them get to know faculty and to decide on what area of mathematics to concentrate. In the spring semester we focused on how mathematics impacts and is used in other fields and why a Math PhD student might consider taking a minor in that field. We had talks by Dieter van Melkebeek of the Computer Science Dept. on “Quantum information processing,” Anthony Ives of the Zoology Dept. on “Population dynamics of midges in Lake Myvatn, Iceland,” and Chris DeMarco of the Electrical and Computer Engineering Dept. on “Falling Dominos in Networked Systems.” Doug Arnold, the Director of the Institute for Mathematics and its Applications (IMA) gave a talk on industrial mathematics and opportunities for mathematicians in industry. One of our current graduate students (James Hamblin) talked about his work on group theory with fifth graders; Abbe Herzig, a former math graduate student who is getting a PhD in math education and is on the faculty of Rutgers University, told us about a study she did about graduate students entering and leaving mathematics. Our final seminar was by Kevin Strobel (PhD 1994, P. Rabinowitz) of the Aegon Insurance Company (Cedar Rapids, Iowa) who gave a talk on “Mathematics in Actuarial Science.”

In summary, it has been a very successful year, not only for our VIGRE program but for all our programs. Next year is looking very good, with many acceptances by top graduate school prospects—including some with VIGRE fellowships, and several excellent postdocs—including three new VIGRE postdocs. And we have hired two outstanding new faculty members that you can read about inside. Enjoy!
...RAB

From the Chair...

This is currently my third and final year as Chair of the Department of Mathematics. I have been very fortunate to serve during a very positive period at the University of Wisconsin, and in these three years we have managed to do a number of things in different categories. Most importantly we have been extremely successful at hiring high quality colleagues in areas of central relevance in mathematics. Given the large number of retirements that we have experienced, this is a hugely important development.

This year we hired two very brilliant young mathematicians: Xiuxiong Chen, currently at Princeton University and Alexander Kiselev, currently at the University of Chicago. Both of them have been hired as associate professors. Xiuxiong is a differential geometer who has established himself as a world leader on the geometry of Kaehler manifolds; his contributions have been recognized by an invitation to deliver an address at this year's ICM. Alexander is an exceptionally talented analyst with interests in applications and he is a recipient of both a Sloan Fellowship and an NSF Career Award. We are delighted by the prospect of having them join our faculty this coming Fall.

This year our department has also been involved in a number of interdisciplinary cluster hiring initiatives, in the areas of string theory, molecular biometry and computational sciences. The idea behind these initiatives is to hire faculty that will work across departmental boundaries, and establish research groups of an interdisciplinary nature. We expect that the benefits from these efforts will be considerable.

In these pages you will read about a number of

awards and distinctions that have been bestowed upon math faculty. This is simply a reflection of the tremendously high quality of our department, which we have worked hard to maintain. In particular we have some very brilliant graduate students finishing up this year, who have been very successful on the job market. The painstaking job of graduate admissions has been coordinated by Jim Kuelbs the past few years, and he has been doing a terrific job. Our graduate students are stronger than ever.

One fact which readers of this newsletter should be aware of is the excellent staff that we currently have in Van Vleck Hall. They are a remarkable group of individuals who deserve our thanks for all their hard work. In particular I would like to single out the dedicated and excellent service provided by Gen Novara, who is our Departmental Administrator. Chairs come and go, but she has provided enormously competent oversight for all departmental affairs for a number of years.

Although you will have read about some ominous budget problems here at Wisconsin don't let that worry you too much. The morale is high and we consider this simply a momentary and cyclical period of difficulty. Given the central role that our department plays at the University of Wisconsin and our sustained excellence, I am confident that we will weather these transient difficulties very successfully. Of course during these times the generosity of our former students and friends is especially appreciated and I can only conclude this brief statement by thanking all of those who made gifts to our department.

Sincerely,
Alejandro Adem
UW-Madison Math Dept Chair

Alumni Information

Please use this form to update our database of alumni. Send to:

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Name: _____

Mailing Address: _____

E-mail Address: _____

New Faculty

This year we have hired two outstanding new faculty, both at the associate professor level. They will join the department in the fall of 2002.

Xiuxiong Chen is new Associate Professor

Professor **Xiuxiong Chen** has been hired as a new associate professor. Xiuxiong received the PhD from the University of Pennsylvania in 1994. His thesis, written under the direction of E. Calabi, is entitled "Extremal Hermitian metrics with curvature distortion in a Riemann surface." His earlier education was in China, and he earned a MA from the Graduate School of Academic Sinica (Beijing) in 1989, and a BSc from University of Science and Technology of China (Hefei) in 1987.

After the PhD, Xiuxiong was an Instructor at McMaster University (Canada) for two years, and then an NSF Postdoctoral Fellow at Stanford University for another two years. Since 1998 he has been an assistant professor at Princeton University.

Dr. Chen works in the area of complex differential geometry, with particular emphasis on the geometric theory of compact Kahler mani-

folds. He has made very significant contributions to the understanding of the space of



Kahler metrics, with his research papers appearing in such journals as Journal of Differential Geometry, Inventiones, and Annals of Mathematics. He has received the distinction of being invited as a speaker at the International Congress of Mathematicians to be held in Beijing this summer.

Alexander Kiselev is new Associate Professor



Professor **Alexander Kiselev** obtained a B.S. in Physics at St. Petersburg (1992) and a PhD in Mathematics at the California Institute of Technology (1996). After spending a year at the Mathematical Sciences Research Institute at Berkeley, he went to the University of Chicago as a Dickson Instructor, a highly prestigious entry level position. Since 1999 he has

been an assistant professor at the University of Chicago.

Dr. Kiselev has worked mostly in two areas: spectral theory and dynamics for Schrodinger operators and models of combustion processes, in particular reaction-diffusion equations. He has brought powerful techniques from harmonic analysis and differential equations to bear on these problems, and his prolific (25 papers) and high quality publication record attests to his great success.

Alexander's work has received considerable recognition. He has held an NSF research grant since 1998 and in 2001 he was awarded a prestigious Sloan Research Fellowship. Just a few weeks ago he was awarded an NSF Career Award, meant to recognize the research and teaching accomplishments of outstanding young mathematicians in the US.

Van Vleck Visiting Assistant Professors

This academic year we have five new Van Vleck Assistant Professors, along with a large group of continuing Van Vlecks.

Seung Yeal Ha received the PhD from Stanford University in 2001 under the guidance of Tai-Ping Liu with a thesis " *L^1 stability for systems of conservation laws with a non-resonant moving source*". His Bachelor's degree is from Seoul National University in Korea. From April to August 2000, Seung was a research assistant at the "Institute of Mathematics, Academia Sinica." His research interests lie in nonlinear stability theory of hyperbolic conservation laws and kinetic equations, and hydrodynamic limit of some kinetic equations.

William J. McGraw received the PhD from the University of Maryland in 2001. His thesis advisors were Stephen Kudla and Lawrence Washington. The title of his thesis is "*On the rationality of vector valued modular forms*." Bill has Bachelor's and Master's degrees from Boston College in mathematics (and also economics for the B.A.). His research interests are in number theory, specifically modular forms and arithmetic properties of their Fourier coefficients. Bill is supported half-time as a Number Theory Foundation Postdoctoral Fellow, from a grant held by Ken Ono.

Manuel A. de Macedo Portilheiro received the PhD from the University of California - Berkeley in 2001. His thesis, supervised by L. Craig Evans, is entitled "*Weak solutions of nonlinear equations and relaxation limits*". His earlier degrees are from the Technical University of Lisbon. Manuel is also supported half-time as a Postdoctoral Fellow on an NSF Focused Research Group Grant, under Mikhail Feldman. His research areas are nonlinear PDE, conservation laws, and Hamilton-Jacobi equations.

Govind Menon received the PhD from Brown University in 2001. His thesis "Geometric methods for the Maxwell-Bloch equations and the kinetics of multiscale mate-

rials" was written under the guidance of G. Haller. He has a Masters degree in theoretical and applied mechanics from Cornell University and a Bachelor's degree in mechanical engineering from the Indian Institute of Technology. His research interests lie in mathematical problems in materials science and optics, and applied analysis. Govind worked at the Max-Planck Institute for Mathematics in the Sciences during the 2000-01 academic year.

Malabika Pramanik received the PhD also from the University of California - Berkeley in 2001. Her thesis advisor at Berkeley was Michael Christ. Malabika was a graduate student at Madison but transferred to Berkeley after one year (1995-96). Her Bachelor's and Master's degrees from the Indian Statistical Institute are in statistics. She gives her research interests as harmonic analysis, specifically scalar oscillatory integrals and oscillatory integral operators, and almost everywhere convergence of Fourier series. She is also interested in scattering theory and PDEs.

Continuing Van Vleck Assistant Professors are: Markus Banagl, Yiftach Barnea, Rebecca Field, Dan Knopf, Rajesh Kulkarni, Ernesto Lupercio, Charles McCoy, Chris Raymond, Bo Su, and Wojciech Wieczorek. Jeremy Lovejoy has been on leave this academic year enjoying a postdoctoral fellowship in France and will return for 2002-03. Continuing Lecturers this year are Marina Arav, Gwynneth Coogan, and Greg Lee.

Next fall, Markus Banagl will start a tenure-track job at the University of Cincinnati; Dan Knopf takes up a position at the University of Iowa; Rajesh Kulkarni will start a tenure-track job at Michigan State University and Charles McCoy will enter the seminary of Notre Dame University.

Visiting Faculty

We have a large number of visitors this year who are teaching and collaborating in research with faculty.

Fall Semester

Marat Arslanov from Kazan State University (Kazan, Russia); mathematical logic.

Antal Balog from Alfred Renyi Institute of Mathematics (Budapest, Hungary); analytic and combinatorial number theory.

Alexander Kleshchev from the University of Oregon (Eugene); representation theory of algebraic and finite groups.

Jacobus Koolen from the University of Bielefeld (Bielefeld, Germany); graph theory and algebraic combinatorics.

Anton Kučera from Charles University (Prague, Czech Republic); mathematical logic.

Jean-Marie Lion from Université Rennes (Rennes, France); mathematical logic.

Boris Zil'ber from the University of Oxford (Oxford, England); mathematical logic.

Professors Arslanov, Kučera, Lion, and Zil'ber taught Math 975 in sequence (3-4 weeks apiece) and worked with Steffen Lempp and Patrick Speissegger.

Spring Semester

Michael Greenblatt from MIT (Cambridge); harmonic analysis.

Kyu-Hwan Lee from Seoul National University (Seoul, S. Korea); Lie algebras and representation theory.

Professors Balog and Kleshchev are also teaching in the spring semester.

Non-teaching visitors, in Madison for an extended stay this academic year, include:

Michael Cullen from the European Centre for Medium Range Weather Forecasts (Reading, UK); applied mathematics.

Nigel Cutland from the University of Hull (Hull, UK); mathematical logic.

John Maginnis from Kansas State University (Manhattan); cohomology of groups.

Robert McCann from the University of Toronto (Canada); partial differential equations.

Iskander Kalimullin from Kazan State University (Kazan, Russia); mathematical logic.

Frank Stephan from the University of Heidelberg (Heidelberg, Germany); mathematical logic and complexity.

Sabbaticals and Leaves

2001-02 Academic Year

Ken Kunen was on sabbatical during the fall semester of 2001-02. Ken was based in Madison and took research trips to Budapest and Toronto. Besides doing research, his sabbatical was used to work on a new edition of his 1981 book "Set Theory" and on curriculum development for Math 131 (one of the courses required for students in the elementary education program).

Alexander Nagel is on sabbatical for all of the 2001-02 academic year. Alex spent the fall semester at the Universitat Autònoma de Barcelona, Spain and is now back in Madison. In Barcelona he collaborated with Joaquim Bruna. During his stay in Barcelona he also made scientific visits to CIRM in Marseille (France), the Scuola Normale in Pisa (Italy), and Christian-

Albrechts University in Kiel (Germany). One of his sabbatical projects is working on a research monograph on finite-type geometry and analysis.

Carl de Boer is also on sabbatical for all of the 2001-02 sabbatical year. Carl is based in Madison and is taking several research trips during the year. One of his major projects is an e-book on splines.

Paul Milewski is spending his year-long sabbatical collaborating with colleagues at the University of Victoria in British Columbia. Among his research visits are trips to the Newton Institute (Cambridge, England), Morningside Institute (Beijing, China), and IMPA (Rio de Janeiro, Brazil).

2002-03 Academic Year

In addition, four faculty members have been granted sabbaticals for next year.

Pat Ahern will be on sabbatical all year at universities in Marseilles, France and La Laguna, Tenerife, Spain.

Steffen Lempp will be on sabbatical all year at the University of Heidelberg, Germany.

Arnold Miller will spend his year-long sabbatical at the Fields Institute and the University of Toronto, Canada.

Paul Rabinowitz will spend one month of his fall semester sabbatical at Princeton University, and one or two weeks at the University of Tokyo, Japan.

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

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

Faculty Dinner Honors Retirees



*From Left: Rod Smart, Lawrence Levy,
Hiroshi Gunji, Claire Rider, John Harvey*

The annual faculty dinner was held on May 2, 2001 at 6:00 PM in the 9th Floor Lounge of Van Vleck Hall. At the dinner, five recent retirees were honored for their service to the department and the university. They were: Hiroshi Gunji, John Harvey, Lawrence Levy, Claire Rider, and Rod Smart. Each of them has been awarded emeritus status.

Hiroshi Gunji

Hiroshi received the PhD from Johns Hopkins University in 1962, under the direction of Jun-ichi Igusa. His thesis was entitled "Some properties of curves of genus 2 representing singular points of variety of moduli." He spent two years at Cornell University, then two years at the University of Saskatchewan before coming to Madison in 1966 as an assistant professor. Hiroshi did important research in number theory and had four PhD students during his tenure here. He had an tremendous impact on our graduate program as chair for very many years of the graduate admissions committee. He was a dedicated teacher of calculus, and not many semesters went by when he wasn't lecturing in a calculus course. Steve Bauman read a letter at the dinner from former colleague Don McQuillan which talked about Hiroshi's contributions to number theory and their joint work together, as well as Hiroshi as a friend and colleague.

One incident which shows how much Hiroshi was admired by his students occurred about ten years ago in a calculus course in which he was lecturing. Hiroshi was using a microphone with a wire attached and it would often get wound up around his feet. Students took up a collection to buy a wireless microphone, distributing leaflets which contained

the words "Free Professor Gunji!"

For many years Hiroshi has been an amateur artist, and he and Josh Chover have often painted together.

John Harvey

John got his PhD from Tulane University in 1961, working with Paul Conrad on partially ordered groups. He joined our Department of Mathematics and the Department of Curriculum & Instruction in 1966 as an associate professor after having spent 5 years at the University of Illinois. At Illinois, he proved with Paul Conrad and (former colleague) Charles Holland, the Hahn embedding theorem for lattice-ordered groups.

In reviewing John's career at the dinner, Bob Wilson said: "John has been incredibly active in many professional areas. He has held major positions in professional societies, he has led reviews of departments, in total I count at least 90 such activities he has taken part in. He has almost 100 published papers and books. He has authored or coauthored 45 different text and test curricular materials and 40 book or article reviews. In 1993 the Wisconsin Math Council named him as its Outstanding Mathematics Educator." John has also been a leader nationally in careful use of technology in teaching mathematics. He had 24 PhD students at Madison.

John's outside interests include music, both listening and singing, and fine wines. According to Bob Wilson again, as related by Lowell Tonnessen [PhD 1980, J. Harvey], John planned to try to drink the collection down to a more manageable size! John has now moved to New Orleans, where his sister and brother-in-law live, but won't be giving up all connections to Madison. The family will have a condo here in Madison where John can come for extended stays.

Lawrence Levy

Larry studied at the Juilliard School of Music and then received his PhD in Mathematics from the University of Illinois working with Irving Reiner. He came to Wisconsin in 1961.

According to Don Passman, who reviewed Larry's career at the dinner: "I have to believe that Larry loves doing mathematical research. He is the only person I know who names his theorems, for example 'The Package Deal Theorem', and names his papers, for example 'The Tome'." In recent years, Larry's research has really flourished. He knocked off several classical problems and he gave numerous invited talks around the world. Then, at the height of his mathematical powers, he decided to retire so that he could get even more work done." As Don also related, Larry is "vowel challenged. He uses a shorthand whereby in his classrooms and in his seminar talks, the vowels are just plain missing."

Larry had 14 graduate students at Wisconsin. One of them Sylvia Wiegand [PhD 1971, L. Levy] tells of Larry's love for the black-bottomed pie at the Wisconsin Union where they would often share one piece for dessert, and then another! Lee Klingler [PhD 1984, L. Levy] mentions Larry's fondness for writing very long papers (very stressful for his coauthors) and the fact that he and Larry have been good friends for twenty years. According to Don Passman, it's still a rumor to him that Larry is a gifted pianist, since he, with much regret, has never heard him perform. Some of us have - long ago - and can verify the rumor.

Claire Rider

Claire received an MS in Mathematics from UW-Madison in 1963 and joined our Mathematics Tutorial Program (MTP) in 1977. In 1988 she became the Director of the MTP, a

position she held until her retirement in 2001. Under Claire's leadership, the MTP has become an integrated part of mathematics instruction in the first two years. Tutoring is offered in ten different courses, with about 300 students distributed over 300 tutorial sections.

According to Dottie Churchwell, one of the MTP tutorial staff, it has been Claire's "devoted and skillful leadership" that has contributed to the success of MTP. "She has diligently insisted on regular participation and effort by each student admitted to the program and routinely contacted various other university offices to help with advising students who need all kinds of special help. When she works with students she gives her best and expects the same from them." Claire served on many committees within the Mathematics Department as well as on the larger campus. She leaves behind a staff, not only devoted to the program but to her as well.

Rod Smart

Rod received the PhD from Michigan State University in 1961, spent one year on a postdoctoral fellowship at the Courant Institute (NYU), and then joined our department in 1961. He spent the academic year 1965-66 at the University of Glasgow on a NSF postdoctoral fellowship. His research focussed on modular & automorphic forms and modular groups, and he supervised the theses of five graduate students.

Later in his career, Rod concentrated his efforts and talents on teaching and computer technology. It was his vision and hard work that led to the initial computerization of Van Vleck Hall and the mathematics computer laboratory. Rod has held many of the important administrative jobs in the department, including TA Supervisor (1980-82) and Associate Chair (1976-78). He worked for many years on the Math Talent Search.

Rod's first PhD student, Bruce Berndt [PhD 1966, J. R. Smart] of the University of Illinois, came up from Champaign-Urbana to honor Rod at the Dinner. Bruce mentioned how Rod was born and raised on a farm and went into mathematics because he disliked farming. As the saying goes, "what goes around, comes around." Rod now lives on a farm outside of Madison and does some "amateur farming."

The day of our faculty retirement dinner, May 2, 2001, was also Walter Rudin's 80th birthday. The special evening concluded with singing "Happy Birthday" to Walter and eating a special birthday cake.



Walter and Mary Ellen Rudin

Honors & Awards

Eleny Ionel to give Invited Lecture at International Congress of Mathematicians (ICM)



This summer **Eleny Ionel** has been invited to lecture at the International Congress of Mathematicians (ICM) in Beijing (China). This is a very prestigious invitation which demonstrates the international attention her research is getting. Eleny, who was featured in last year's newsletter having received a Sloan Fellowship, works on symplectic topology and 4-manifolds, and Gromov-Witten and Seiberg-Witten invariants. She has also been invited to give a plenary lecture at the AMS Meeting to be held in Madison this October.

Shi Jin awarded Feng Kang Prize

This past summer, **Shi Jin** was notified that he has received the fourth Feng Kang Prize in Scientific Computing. The Feng Kang Prize was set up by the Chinese Academy of Sciences in 1995 in the name of the late Professor Feng Kang, the founding father of computational mathematics in China and an independent inventor of the finite element method. Every other year two scientists, one from China and one from overseas, are given this prize. Shi was the overseas recipient in 2001. According to the citation, he was awarded the Feng Kang Prize for his "significant contributions in Numerical PDE's and Scientific Computing." Shi was also awarded a Cheung Kong Professorship by China's Ministry of Education. This highly competitive professorship was set up jointly by Hong Kong's Cheung Kong Inc. and China's Ministry of Education. Every year up to ten overseas scholars from all areas of sciences and engineering are awarded this special professorship. Shi is one of the seven recipients of this position this year, and will spend about two months each summer of the next five years at China's Tsinghua University. Yongbin Ruan was awarded such a position last year.

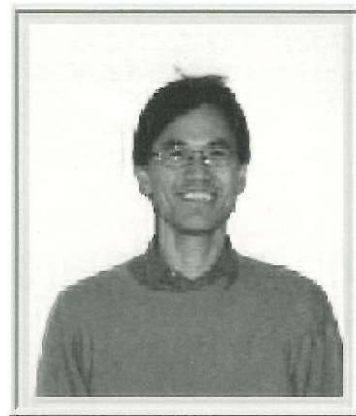


Yong-Geun Oh promoted to Professor and wins Vilas Associates Award

Yong-Geun Oh, who joined the Department of Mathematics in 1992 has been promoted to (full) Professor. The Graduate School has also named Yong-Geun as a Vilas Associate for 2002–04. This award provides summer salary support for two years and \$10,000 each year in flexible research for support of his research and other scholarly activities.

On leave this academic year, Yong Geun is concentrating on research and participating in the special program "Symplectic geometry and holomorphic curves" held at the Institute for Advanced Study, Princeton. He is one of the editors of the recently published Proceeding of the International Conference "Symplectic geometry and mirror symmetry." The conference was held at the Korea Institute for Advanced Study (KIAS), and the proceedings published by World Scientific Press. Yong Geun plans to devote some time over the next few years writing a book on symplectic geometry and mirror symmetry, especially on the Floer theory introduced in the late 1980's in an attempt to prove the Arnold conjecture providing a lower bound on the number of fixed points of general Hamiltonian diffeomorphism groups (the number of intersection points of a pair of Lagrangian submanifolds).

The Vilas Award follows the Korean Young Scientist Award that Yong-Geun received last year from Korean president Kim Dae Jung; see last year's newsletter.



Alexander Nagel named Lipman Bers Professor of Mathematics



Alexander Nagel has been awarded a special professorship at UW-Madison and has chosen the name Lipman Bers Professor of Mathematics. Alex received an undergraduate degree from Harvard College in 1966 and a PhD from Columbia University in 1971. He joined our Department of Mathematics in the fall of 1970. Alex's mathematical research has focused on questions in complex and harmonic analysis. During the more than 30 years of his distinguished research career, he has studied the boundary behavior of holomorphic functions, Hilbert transforms along curves and surfaces, the decay of the Fourier transform of surface carried measures, metrics generated by vector fields, and function theory in domains of finite type. Currently his research is focused on nilpotent Lie groups that arise as submanifolds of complex vector spaces.

Alex's important and continuing contributions to our undergraduate and graduate programs were recognized by UW-Madison with the Amoco Distinguished Teaching Award in 1982. He was Chair of the Department from 1991 to 1993. In 1993 he accepted the responsibility to be Associate Dean for Natural Sciences in the College of Letters and Sciences, and remained in that position until 1998.

Alex has held visiting positions at Princeton University, at the University of Paris and other French universities, and at the Mathematical Sciences Research Center (MSRI) in Berkeley, California. He was the recipient of a Guggenheim Fellowship in 1987.

Alex chose to name his professorship after Lipman Bers who was his major professor at Columbia and was an important figure in 20th century mathematics. Bers was known for his deep contributions in geometry and analysis, specifically function theory, partial differential equations, quasi-conformal mappings, moduli theory of Riemann surfaces, and Kleinian groups. He was also known for his passionate support of human rights.

Ken Ono promoted to Professor and wins Romnes Fellowship

Ken Ono who joined the Department of Mathematics as Associate Professor in 1999, has been promoted to (full) Professor. Ken has also won the prestigious Romnes Fellowship from the Graduate School. This is a \$50,000 research award for faculty within 6 years of being tenured. Ken is a number theorist, one of whose special interests is the partition function $p(n)$. Last year's newsletter contained a more detailed description of Ken's research.

One of Ken's recent papers was written up as a feature story in the June 16, 2001 issue of *Science News*. The article is entitled "Surprisingly Square" and it is about recent papers by Ken, Steve Milne (Ohio State Univ.) and Don Zagier (College de France) on the representations of integers as sums of squares. The text of this story can be found at:

<http://www.math.wisc.edu/~ono/squares.html>.

The December 2001 issue of *Science News* listed this paper as one of the most important mathematical achievements of 2001.

Ken has been selected by the U. S. National Academy of Sciences to be a member of the 2002 Chinese-American Frontiers of Science Symposium Organizing Committee. As part of the National Science Foundation's 50th Anniversary Celebration, the NSF invited Ken to give guest lectures with Leon Lederman (Emeritus Director of FermiLab, and 1988 Nobel Laureate in Physics) to high school students in Missoula, Montana on May 2, 2001. For more on this see:

[http://www.missoulain.com/archives/index.inn?loc=detail
&doc=/2001/May/16-160-feature06.txt](http://www.missoulain.com/archives/index.inn?loc=detail&doc=/2001/May/16-160-feature06.txt)

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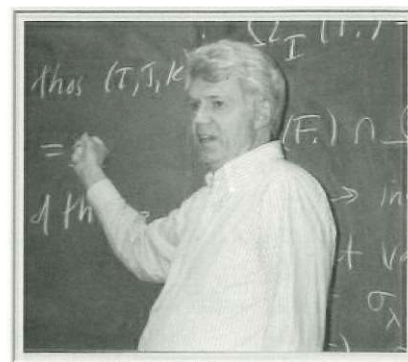
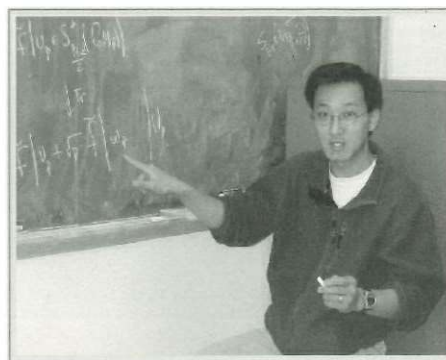
In connection with this celebration, Ken and Leon Lederman appeared on the NBC Today Show on May 2.

With Bruce Berndt (PhD 1969, J. R. Smart) Ken edited the AMS Contemporary Mathematics book " q -series with applications to combinatorics, number theory and physics" (volume 291, 2001).

Special Lectures

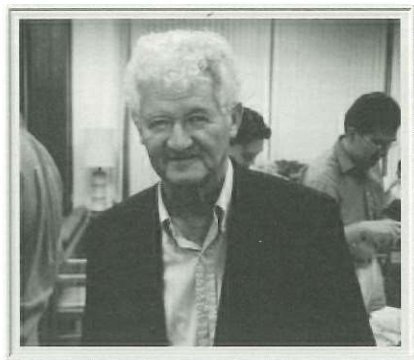
6th Annual LAA Lecturer

Professor **William Fulton** of the Department of Mathematics of the University of Michigan gave the Sixth Annual LAA Lecture on April 27, 2001. The title of his lecture was "Eigenvalues of sums of Hermitian Matrices." Professor Fulton discussed the history of the problem of characterizing the possible eigenvalues of two Hermitian matrices and their sum, and the recent solution by A. A. Klyachko with A. Knutson and T. Tao. He also discussed several related problems in algebra, geometry, and representation theory. Dr. Fulton's article "Eigenvalues, Invariant Factors, Highest Weights, and Schubert Calculus" appeared in the *Bulletin of the American Mathematical Society* 37 (2000), 209-249.



William Fulton

6th Wolfgang Wasow Memorial Lecturer



Peter Lax

On November 7, 2001 Professor **Peter D. Lax** of the Courant Institute of Mathematical Sciences (NYU) gave the *Sixth Wolfgang Wasow Memorial Lecture* on "Multiple Eigenvalues." (This lecture was originally scheduled to be given in September but was postponed due to the tragic events that occurred on September 11, 2001.) This lecture was concerned with the discriminant of a real symmetric matrix of order n (i.e. of its eigenvalues). The discriminant is a homogeneous nonnegative polynomial of degree $n(n-1)$ in the entries of the matrix. As first shown by Hilbert, nonnegative polynomials of degree greater than 2 and in more than two variables, cannot always be written as a sum of squares of polynomials.

In the lecture it was demonstrated that the discriminant of real symmetric matrices can always be so written. In fact, N. Ilyushekin gave an explicit representation as a sum of $n!$ squares. Introducing Professor Lax, Shi Jin said: "Dr. Lax is one of the greatest applied and theoretical mathematicians of the 20th century who has made significant contributions to mathematics and scientific computing, including partial differential equations, integral systems, computational fluid dynamics, and hyperbolic conservation laws. His name is connected with many major mathematical results and numerical methods, such as the Lax-Milgram Lemma, the Lax Equivalence Theorem, the Lax-Wendroff Scheme, the Lax-Friedrichs Scheme, the Lax Entropy Condition, the Lax Pair, the Lax-Levermore Theory, etc. His scientific contributions have been recognized by many awards: the National Medal of Science, the Wolf Prize, the Wiener Prize, election to the National Academy of Science, ... His expository skills have led to the Lester R. Ford Award and the Chauvenet Prize."

Professor Lax is also a distinguished educator who has mentored numerous graduate students and postdocs. He gave a lecture in our 9th floor conference room on "The Paradox of Education."

Distinguished Lecturer



Cumrun Vafa

Dr. **Cumrun Vafa**, Professor of Physics of Harvard University, was our *Distinguished Lecturer* in the spring of 2001. He visited UW-Madison during the week of May 7, 2001 and gave two lectures. One was a joint Mathematics and Physics Colloquium on "Geometric

Physics." The other was a Graduate Student String Theory Seminar given in our 9th floor conference room. In the seminar he discussed the relationships between the Homfly polynomial of a knot and Chern-Simons gauge theory.

Dr. Vafa's research interests lie in theoretical high energy physics with emphasis on such fundamental questions as the nature of quantum gravity and the relation between geometry and quantum field theories. String theory is a strong candidate for a unified description of gravity and other forces. With A. Strominger he discovered that the Bekenstein-Hawking entropy of a black hole can be accounted for by solitonic states of string theory. One of Professor Vafa's current interests is application of string theory to some unsolved questions of particle physics such as the hierarchy problem and the cosmological constant problem.

The *Special Lectures Committee* has chosen the 2001–02 LAA and Wasow Memorial Lecturers. They are **Thomas Kailath** of Stanford University, who will give his LAA Lecture in April of this year, and **John Erik Fornaess** of the University of Michigan, who will give his Wasow Memorial Lecture in October.

Distinguished Lecturers for 2001–02 have also been announced. **George Papanicolaou**, Stanford University, will be Distinguished Lecturer visiting the department on April 24–26, 2002. **Armand Borel**, Institute for Advanced Study, will also be a Distinguished Lecturer, visiting the department on May 7–8, 2002.

Conference News

MathFest in Madison, Rudins honored

MathFest, the annual summer meeting of the Mathematical Association of America (MAA), was held in Madison on August 2–4, 2001. The meeting, held in the Monona Terrace Community and Convention Center on the shores of Lake Monona, set a new attendance record. Attendees were so delighted with Madison and the facilities (and facilities used in Van Vleck Hall), that there is talk of a return in a few years. [Just announced, MathFest returns to Madison in 2007.] The meeting featured the Hedrick Lectures by Ingrid Daubechies of Princeton University on wavelets, and an invited address by Michael Starbird



[PhD 1974, M. E. Rudin] on “The other lessons: What students keep for life” of the University of Texas. Also featured was an invited address by Frank Morgan of Williams College on the proof of the double bubble conjecture. Frank brought many undergraduate students from Williams College; thanks to the initiative of Charlotte Chell [PhD 1969, J. B. Rosser], Frank and his students appeared on a live broadcast of Michael Feldman’s show on National Public Radio (NPR). According to Ed Burger who was chair of the Program Committee “everyone was talking about the main lectures and the attendance at the lectures themselves was dramatically high.” Two graduate students, Berit Givens and Andy Raich, volunteered to help out at the registration desk and were a big success with the MAA.

The annual MAA 25-year banquet was held on August 4, 2001 at the Concourse Hotel in Madison. It included several events of Wisconsin note. There was a ceremony honoring **Mary Ellen Rudin** and **Walter Rudin** for “their long, outstanding, and distinguished service to mathematics” (the same can be said of their service (still continuing!) to UW-Madison). Mary Ellen was introduced by former student Mike Starbird; Walter was introduced by Len Gillman who said he first met Walter in 1950. A glass sculpture by Wisconsin artist Audrey Handler was presented to the Rudins by Richard Askey, who was also honored at the banquet for being a 50-year member of the MAA and for his efforts in promoting mathematics and mathematics education throughout Wisconsin. As the then Governor of the Wisconsin MAA section, Fred Tufte, said, Dick has probably given talks at every undergraduate institution in Wisconsin (and there are many!). Others recognized for being MAA members for 25 or more years were: Mary Ellen Rudin (49), Walter Rudin (46), Hans Schneider (45), Robert L. Wilson [PhD 1947, C.C. MacDuffee] (41), Melinda Certain [PhD 1974, R. Askey] (40), Charlotte Chell (39), Michael Bleicher (37), Sylvia Wiegand [PhD 1971, L. Levy] (29), and Michael Starbird [PhD 1974, M. E. Rudin] (26).

At the 25 year dinner, Sylvia Wiegand (nee Young) gave a talk on the mathematical heritage of Grace Chisholm Young (1868–1944) and William Henry Young (1863–1942). Grace Young was the first woman to receive a PhD in Germany and one of the first women mathematicians to do a substantial amount of research. Laurence Chisolm Young (1905–2000), who was Professor of Mathematics at Wisconsin from 1948 to 1976, was their son, and Sylvia was the daughter of Laurence Chisholm and Elizabeth Mary Dunnett.

Other social events included a “real” Wisconsin Fish Boil. Our traditional “Wisconsin Reunion” was held on the 9th floor of Van Vleck Hall the first night of the meeting. As usual this was a lot of fun with so many of our former students in Madison.

The last afternoon of the regular meeting and the day after there was a well-attended short course on Ramanujan’s life and legacy, organized by Ken Ono, with Ken, Scott Ahlgren, George Andrews, Richard Askey, and Bruce Berndt as speakers.

Conference on Mathematical Aspects of Orbifold String Theory

This conference, organized by **A. Adem**, **J. Morava** and **Y. Ruan**, was held in Madison in early May 2001. It attracted over 50 world class researchers in mathematical physics and related areas. The main speakers at the conference were Cumrun Vafa (Harvard), Miles Reid (Warwick), Jeff Harvey (U.Chicago), Paul Aspinwall (Duke), Ieke Moerdijk (Utrecht),

Lev Borisov (Columbia University) among many others. The conference was supported by an NSF grant and included a lively one hour discussion of ways to promote interactions between math and physics. A proceedings volume will appear in the AMS series Contemporary Mathematics. *by Alejandro Adem*

AMS Central Section to meet in Madison

The Central Section of the American Mathematical Society will hold its meeting at UW-Madison on October 12-13, 2002. Invited addresses will be given by Lawrence Ein (University of Illinois, Chicago), Eleny Ionel (UW-Madison), Mikhail Safonov (University of Minnesota), and John Sullivan (University of Illinois, Urbana-Champaign). Eighteen special sessions are being organized, covering a wide

range of topics; as a result, participation in the meeting is expected to be high. Look for details in the AMS Notices.

We hope that this meeting will afford an opportunity for many Wisconsin PhDs and other Wisconsin friends to come back for a visit to Madison and the Mathematics Department here. We always warmly welcome back old friends.

Staff News

Matthew Carroll Joins Computer Staff

This past summer, **Matthew Carroll** joined our computer staff as Associate Information Processing Consultant. Matt comes to us by way of UW-Milwaukee where he was Software Support Specialist – Linux/Unix Administrator since 1998. He earned a BS degree from the School of Engineering in Computer Science (computer science program) of UW-Milwaukee. At Milwaukee, Matt supported and maintained the campus-wide Unix servers and is very familiar with the Debian Linux operating system. While Senior Information Processing Consultant, Yvonne Nagel, was in Barcelona during the fall semester 2001, Matt was in charge keeping our computer system running smoothly.



From top left: Matthew Carroll, Yvonne Nagel, Matthew Petro, Timothy Cookson

David Camacho is new Math Tutorial Program Director



Beginning with the fall semester in 2001, **David Camacho** has assumed the position of Director of the Mathematics Tutorial Program, succeeding its long-time director Claire Rider. David received his Bachelor's and Master's degrees in engineering from the National Autonoma University of Mexico, and a PhD in Civil Engineering (Structures) from the University of Minnesota in 1993. He comes to us with a wealth of experience.

David worked at the University of Minnesota in many capacities after getting his PhD. He worked with their TRIO Program's Student Support Service, McNair Scholars, and Upward Bound Math & Science. He taught mathematics in the Minnesota's General College, lectured in the Department of Civil Engineering, and taught calculus and physics in a summer enrichment program of

the College of Biological Science and Health Sciences. While in Minnesota he also taught mathematics courses at the Metropolitan State University.

Most recently, Dr. Camacho was director of the Upward Bound Math & Science TRIO Program at the University of Wisconsin-Milwaukee. This is a program targeting low-income, first-generation students who attend Milwaukee public high schools, with the goal of encouraging them to pursue a math or science related major in college. At Milwaukee he also taught in the College of Engineering and Mathematical Sciences.

Before coming to the United States, David worked in research, design, and development with Mexico's Federal Electricity Commission and Mexicana de Cobre.

In addition to directing our tutorial program, David also teaches at least one mathematics course a year.

Student and Instructional News

8th graders visit Van Vleck Hall

Responding to a request from mathematics teacher Matt Rose of Homestead High School in Mequon, Wisconsin, the Department of Mathematics hosted a group of 8th-graders (and some 7th-graders) last November. Mr. Rose teaches a double accelerated program for 8th graders at Homestead and wrote to Dan Shea asking about the possibility of visiting the Department. The students, among the very brightest and gifted math students at Homestead, were currently studying Geometry and would be in Calculus BC as juniors. Mr. Rose wanted to expose his students to career possibilities in mathematics and research activities here in Madison.



Dan Shea and others put together a full program for this visit: (1) morning gathering in the 9th floor conference room; (2) presentation by Dan Knopf and two undergraduates, Creighton

Hogg and Ryan Croke, working in his Minimal Surfaces Lab (coincidentally, Ryan was a 1997 graduate of Homestead); a talk on “My Favorite Polyhedra” by VIGRE graduate fellow Matt Bloss; and a talk by Marty Isaacs about the Talent Search, including working through some of the solutions of its problems. Following a light lunch, there was a conversation with undergraduates Matt McGinley (a graduate of Minnesota’s UMTYMP 4-year high school program, and UW Math/Physics/Biochem major) and Sara Childs. The program ended with a visit to the Soils Science Building to meet with Professor Jerry Tyler and his students Jenny Erickson and Keith Schiller, who showed some computer simulations of problems in soil science that can be studied via quantitative methods.

With the increasing need for mathematical training in more and more disciplines, a very important goal is to get talented young students interested in mathematics as early as possible and to sustain that interest. We hope that some students will go on to earn PhDs in mathematics, while others will use their mathematical knowledge and training in other ways. Programs like that at Homestead High School are very important, and we hope that the time invested by people in the Department of Mathematics contributes to this goal as well.

Talent Search Honors Day



Don Passman and Honorees

The Honors Day for the Mathematics Talent Search was held on May 9, 2001 with 17 students invited to attend (seven from West High here in Madison). The Van Vleck Scholarship winners (\$6,000 for each of four years at UW-Madison) were Chad Koch of Appleton’s West High and Alec Li from Madison’s West High.

The program for these gifted students consisted of talks “Basketball and Statistics” by Professor Bob Wardrop of the Statistics Department and “Kenneth Arrow shows that the Tsar knows” by Professor Steve Bauman of the Mathematics Department. After the lunch in the 9th floor conference room and the awards ceremony, students, their teachers, and their parents were treated to a tour of the new Chemistry building.

Here are a couple of problems from this year’s Talent Search.

1. For how many integers n is the quantity $n^2 - 20n + 244$ equal to a perfect square?
2. Let S be a finite set and let X be a nonempty collection of subsets of S . If each of the sets in X contains more than half of the elements of S , show that there is some element of S that is in more than half of the subsets in X .

UNDERGRADUATE

Allie Blomquist named Academic All-American

Allie Blomquist a mathematics major at UW-Madison, was named last year to the Verizon/CoSIDA first team Academic All-American, repeating her selection from last year. She was the first ever Badger woman golfer to be selected a first team Academic All-American. Allie, who has had a 3.912 cumulative grade point average, was one of just 15 Division I university athletes named to the first team at-large nationally. She completed her eligibility as the most accomplished woman golfer in UW history.

Allie was also named Wisconsin's 2001 Female Medal of Honor winner. The annual award

offered by the Big Ten Conference honors a senior male and female athlete from each institution who has displayed academic and athletic excellence. She was also the 2001 Remington Scholar signifying the highest grade point average of any woman athlete. If that isn't enough, Allie was also selected last year as Wisconsin's candidate for NCAA Woman of the Year, an award that recognizes the athletic, academic and community service contributions of athletes. She was a member of the UW Athletic Board for two years, and participated in the Read Across America program at a local middle school. Allie graduated in 2001.

Undergraduate Scholarship Awards

At the annual student awards ceremony on April 30, 2001 several awards were presented to our best undergraduate students:

Named Scholarship	Award	Recipient
R. C. Buck Prize for Creativity in Mathematics	\$500	Adam Loeffler
David and Janet Kirkbride Scholarship in Mathematics	a semester's tuition	Abraham Smith
Mark H. Ingraham Scholarship	\$500	Jonah Gaster Geir Helleloid Keng Lap Ao
Frank D. Cady Scholarship	\$500	Matthew Felton Jarvis Haupt

At the ceremony, **Dan Koellen** who graduated in 1979 in the Applied Mathematics, Engineering, and Physics (AMEP) program talked on the role of mathematicians in industry. Dan related that a person working in industry has to focus on the problems and the challenges that the employer is facing, even though one's interest may be elsewhere. Dan said that the most important skill a mathematician brings to industry is her or his ability to problem solve and think creatively.

Dan has just made a donation to the Mathematics Department to establish an AMEP Support Fund and an AMEP Leadership Prize Fund. We will have more on this in next year's newsletter.

GRADUATE

Eleven PhDs Awarded in 2001

Eleven graduate students, a smaller number than usual, earned PhDs in mathematics in 2001. They are listed below with their thesis advisor, thesis title, and current address.

BORGES, Maria J. (Advisor, P. Rabinowitz)
"Homoclinic and heteroclinic solutions for a Hamiltonian system in the plane",
 Auxiliary Professor, Dep. Matematica, Inst. Superior Tecnico, Av. Rovisco Pais, 1096 Lisboa Codex Portugal.

CHEN, Bohui (Advisor, Y. Ruan)
"A smooth compactification of moduli of instanton and its application",
 C.L.E. Moore Instructor, Dept. of Math., MIT, Cambridge, MA 02139-4307.

LANG, Michael S. (Advisor, P. Terwilliger)
"Some results on bipartite distance-regular graphs",
 Assistant Professor, Dept. of Math., UW-LaCrosse, LaCrosse, WI.

MACLEAN, Mark (Advisor, P. Terwilliger)
"Bipartite distance-regular graphs and their primitive idempotents",
 Assistant Professor, Dept. of Math., Univ. of North Carolina-Asheville, CPO #2350, One University Hgts., Asheville, NC 28804-8511.

ZHANG, Wanchuan (Advisor, Y. Ruan)
"A vanishing theorem in local mirror symmetry",
 Software Engineer, Informix Software, Portland, Oregon 97201.

BAKER, Joni E. (Advisor, K. Kunen)
"Some topological results on ultrafilters",
 Senior Analyst, Daniel H. Wagner Assoc.
 Home address: 724 Westover Ave #2, Norfolk, VA 23508.

CHRISTLEIB, Andrew J. (Advisor, W. Hitchon)
"Computational methods for long mean free path environments",
 Postdoctoral Fellow, Dept. of Aerospace Engineering, Univ. of Michigan, Ann Arbor, MI 48109-2140.

HSIEH, Liang-Yu (Advisor, R. Brualdi)
"On minimum rank matrices having prescribed graph",
 2021 Lakeview Ave, Middleton, WI 53562.

PODDAR, Mainak (Advisor, Y. Ruan)
"Orbifold Hodge numbers for Calabi-Yau hypersurfaces",
 Instructor, Dept. of Math., Michigan State U., Wells Hall, East Lansing, MI 48824.

VOVKIVSKY, Taras (Advisor, A. Adem)
"Groups acting on trees and algebraic K-theory",
 Software Developer, Epic Systems Corp., 909 S. Whitney Way #5, Madison, WI 53711.

WILES, Peter S. (Advisor, J. Harvey)
"Coordinating mathematical and pedagogical content in preservice teacher education",
 Assistant Professor, University of Arizona, Tucson, AZ 85721.

There will be a number of graduate students finishing up PhDs this May or August. It is too early to know what kind of appointments all our graduates will accept. But Matt Boylan (PhD 2002, K. Ono) has already accepted a three-year NSF VIGRE Postdoctoral Fellowship from the University of Illinois at Urbana-Champaign. Matt, who was supported by a VIGRE fellowship in Madison, took only three years to get a PhD! Other graduate students finishing their PhDs and the positions they have accepted are: Gautam Bharali (PhD 2002, A. Nagel) to the University of Michigan; Xiantao Li (PhD 2002, S. Jin) to Princeton University; Bernardo Uribe (PhD 2002, A. Adem) to the Max Planck Institute and the University of Michigan; ChanWoo Yang (PhD 2002, A. Seeger) to the Johns Hopkins University.

NEW GRADUATE STUDENTS in 2001-02

This academic year we have twenty-eight new graduate students. Their names and undergraduate institutions are listed below.

ALFELD, Christopher P.	University of Utah-Salt Lake City
ANDERSON, Jaclyn Ann	University of Nebraska-Lincoln
ANDREJKO, Erik Andrejko	Arizona State University-Tempe
CHEN, Liang	Peking University (China)
DEMETRIOU, Stella D.	University of Cyprus
DENG, Geng	Tsinghua University (China)
EAPEN, Jacob	University of Wisconsin-Madison
FRATARCANGELI, Sergio	Purdue University
GREENBLATT, Aaron P.	Duke University
GRIFFETH, Stephen P.	Carleton College
ISSA, Leila N.	American University of Beirut (Lebanon)
JONAITIS, Graham D.,	Case Western Reserve University
KACH, Asher M.	University of Illinois-Urbana/Champaign
KIM, Ahyoung	Yonsei University (Korea)
LALONDE, Trent L.	Clarkson University
LEIDA, Johann K.	University of St. Thomas
LIAO, Xiaomei	Tsinghua University (China)
MAHLBURG, Karl E.	Harvey Mudd College
MIRANDA-MENDOZA, Fernando	University of Michoacan (Mexico)
PETROSYAN, Nansen	University of Utah-Salt Lake City
PINA, Jaime	DePaul University
RAGHAVAN, Dilip	College of Wooster
SENKOWICZ, Rebecca B.	University of Pittsburgh
TSAI, Eugene Y.	University of Illinois-Urbana/Champaign
WANG, Jue	Peking University (China)
YEUNG, Chi Yung	University of Hong Kong
ZHAO, Xin	Nankai University (China)
ZHOU, Ling	University of Science and Technology (China)

Many of our new graduate students have received prestigious fellowships. Jaclyn Anderson has a Lucent Technology Fellowship, and Johann Leida has a National Science Foundation Fellowship. Jamie Pina was selected for a Graduate School Fellowship. Awarded VIGRE fellowships were Stephen Griffeth, Asher Kach, Trent Lalonde, and Karl Mahlborg. It has just been announced that Karl Mahlborg has received a 3-year NSF Fellowship to continue his graduate studies.

Several continuing graduate students were given 6-month or 1-year VIGRE fellowships for 2002. They are:

4th Year Students, 6 months: Michael Lau, Joshua Davis and Jeffrey Kline

3rd Year Students, 1 year: James Bisgard, Matthew Ondrus, Peter Spaeth and Nat Thiem

2nd Year Students, 1 year: Christopher Dwyer and Robert Owen

Department Awards to Graduate Students

Our annual Awards Ceremony was held on April 30, 2001 with many awards given to our graduate students for research, teaching, and service.

Selected to receive *Math Department Teaching Awards* (an award certificate and a \$75 gift certificate at the University Bookstore) were **Matthew Bloss** and **Prabu Ravindra**. This award recognizes at least three semesters of noteworthy teaching. **Berit Givens** was selected for the *Sustained Excellence in Teaching & Service*. This latter award is given for noteworthy teaching over a longer period of time.



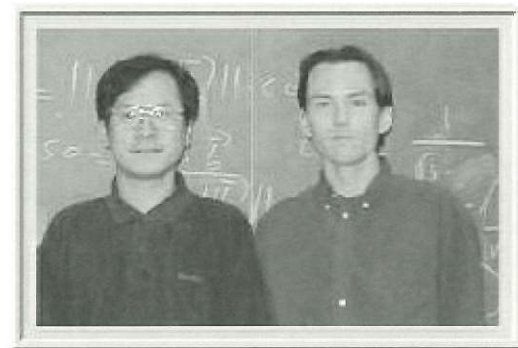
Berit Givens, Andy Raich,
Prabu Ravindran

Matthew Bloss and Andrew Raich named L&S Teaching Fellows

Matthew Bloss and **Andy Raich** were chosen to be L&S Teaching Fellows for 2001. These awards recognize the high quality in teaching performance and other contributions of teaching assistants in the College of Letters and Science. Both Matt and Andy organized workshops for incoming TAs in the College during Welcome Week last fall. Matt is working on a thesis on Lie algebras with Georgia Benkart. Andy is working with Alex Nagel on harmonic analysis.

Excellence in Mathematical Research Awards to Bernardo Uribe and Chan-Woo Yang

Chan-Woo Yang is a student of Andreas Seeger. His research is concerned with the precise regularity properties of the generalized Radon transform in the plane. One of his papers has been accepted for publication in the *Transactions of the American Mathematical Society*. Chan-Woo will take up a position at Johns Hopkins next academic year.

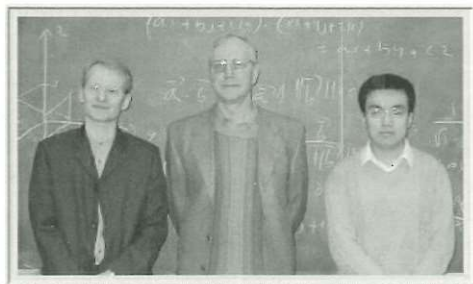


Chan-Woo Yang and Bernardo Uribe

Bernardo Uribe is a student of Alejandro Adem working in the areas of topology & geometry. One part of his thesis research concerns a proof of a conjecture of Yongbin Ruan about the orbifold cohomology of symmetric products of a complex surface. Bernardo has also written two papers with Van Vleck Assistant Professor Ernesto Lupercio on orbifolds, gerbes, and groupoids. Bernardo will be going to the Max Planck Institute next year and then the University of Michigan.

Both Chan-Woo and Bernardo received a \$250 check and a \$100 University Bookstore certificate.

John Nohel Prize in Applied Mathematics to Xiantao Li and Narfi Stefansson



Narfi Stefansson, Carl de Boor,
Xiantao Li

The first John Nohel Prizes for a thesis in Applied Mathematics were given to graduate students **Xiantao Li** and **Narfi Stefansson**. Each was presented with a check for \$250 and a \$100 University Bookstore certificate at a ceremony on the 9th floor of Van Vleck Hall. Carl de Boor recalled that the prize is meant to honor the memory of John Nohel who died suddenly in 1999. Paul Rabinowitz recalled John's long association with UW-Madison. John served as Chair of the Department, as Director of MRC, and as the first Director of CMS. He was born in the (now) Czech Republic and later served in the US Navy (thereby acquiring his US citizenship). He received a PhD from MIT under Norman Levinson,

and was very proud to have been co-editor of Levinson's collected works, a project completed shortly before his death. John was very good with young people and this fact led to a prize in his name for graduate students.

Xiantao Li is a student of Shi Jin who transferred from Georgia Tech when Shi Jin joined our department. His thesis studies the semiclassical limit of the Schrödinger equation and related problems. According to Shi Jin, Li's work has generated a lot of interest among researchers in integrable systems and dispersive waves, and it is expected to have a significant impact. He also describes Li as an independent researcher who is strong in both applied analysis and numerical computation, a combination that is very important for a modern applied mathematician. Xiantao has accepted a position at Princeton University.

Narfi Stefansson is a student of Amos Ron who calls Narfi "an epitome of a graduate student in interdisciplinary mathematics." His primary research is in scientific computation, specifically he has developed efficient algorithms in using wavelet frames in image compression. Narfi has also studied possible encoding strategies for his algorithm. In addition, he has worked as a Research Assistant in a molecular biology lab, where he developed an image compression module based on wavelet techniques.

French-Felten Award to Joshua Davis

For the fourth year in a row, a mathematics teaching assistant has been awarded the French-Felten Award for Inspirational Teaching by the College of Letters & Science. The purpose of the award is to recognize and reward exceptional teachers at an early stage in their careers. **Josh Davis**, a student of E. Ionel working in symplectic geometry, is a 4th-year graduate student who had a WARF fellowship in his first year. His first experience as a TA was in Math 222 in the fall semester of the 2000-01 academic year. He was a TA for Math 234 in the spring semester of that academic year.

In recognizing Josh, his many qualities as a TA were highlighted; among them were enthusiasm that ignites students, organization and planning that inspire students, and caring attitude. In his first two semesters of teaching, 100% of his students gave him the highest possible score for an overall evaluation of his teaching and the course. Josh received his award, including a check for \$400, from Dean Phillip R. Certain at a ceremony on October 18, 2001 at the Pyle Center. He was accompanied by Professor Alejandro Adem.



Joshua Davis, Phillip Certain,
Alejandro Adem

Elizabeth Hirschfelder Award for Women to Christine Carracino, Youngmi Hur and Kathryn Temple



Christine Carracino, Youngmi Hur
Kathryn Temple

Graduate students **Christine Carracino**, **Youngmi Hur**, and **Kathryn Temple** were chosen to be this year's recipients in the Mathematics Department for the *Elizabeth Hirschfelder Award* for women graduate students. These scholarships are made possible by a generous contribution of Elizabeth Sokolnikoff Hirschfelder (PhD 1930, M. Ingham). Mrs. Hirschfelder turns 100 on April 15, 2002.

Christine, a 1998 graduate in mathematics from the University of Virginia, is working in complex analysis — estimates for the Szego kernel on a non-pseudoconvex domain — with Alex Nagel.

Youngmi is studying statistical aspects of redundant wavelet representations with Amos Ron.

Kathy, a 1999 graduate of the University of Washington with a double-major in Economics and Pure Mathematics, is working with Tom Kurtz in probability.

Other News

Alejandro Adem gave invited lectures this past year at many different places including Princeton, Stanford, Singapore, and Chengdu (China). He spoke in the BOURBAKI SEMINAR in Paris (November 2001) on "Finite Group Actions on Acyclic Complexes." In June 2001, he was a Visiting Scholar at Hong Kong University of Science and Technology.

Melania Alvarez Adem has been promoted from Assistant Researcher to Associate Researcher with the Quantitative Assessment Project.

Anatole Beck is spending the spring 2002 semester collaborating in research with colleagues at the London School of Economics.

Georgia Benkart gave an invited talk "Going Up and Down" at the AMS Regional meeting in Atlanta, Georgia.

New colleague **Lev Borisov** is at Columbia University this academic year and will join us in the fall of 2002.

The Council of the Institute of Combinatorics and its Applications (ICA) has chosen **Richard A. Brualdi** as one of the two recipients of its Euler Medals for the year 2000. According to the citation, the Euler Medal is awarded "for a lifetime career of distinguished contributions

to combinatorial research by a member of the ICA who is still active in research".

Van Vleck Assistant Professor **Jan Bruinier** won the prestigious Heisenberg Fellowship and has now returned to Germany.

Thomas Hangelbrock, a student of Amos Ron, is spending the year at the Max Planck Institute (Germany) on a Graduate student visiting fellowship.

I. Martin Isaacs is on leave during the 2002 spring semester, working for the Center for Communications Research of the Institute for Defense Analyses in La Jolla, CA. Marty's 19th student, James Hamblin, will finish his PhD this spring.

Shi Jin was one of the distinguished speakers at the 2001 Chinese-American Frontiers of Science Symposium which was held in Beijing in September 2001. At most one U.S. mathematician is selected each year so this is a special honor.

Steffen Lempp is putting his Vilas Associates Award (see last year's newsletter) to good use. He used the award this past summer to spend three productive weeks at the University of Maryland and six more at the University of Connecticut. Steffen became a U.S. citizen (but

kept his German citizenship).

Yong Geun Oh is on leave in the 2001–02 academic year participating in the special program “Symplectic geometry and holomorphic curves” held at the Institute for Advanced Study, Princeton. Yong Geun is one of the editors of the recently published Proceeding of the International Conference “Symplectic geometry and mirror symmetry.” The conference was held at the Korea Institute for Advanced Study (KIAS), and the proceedings published by World Scientific Press.

Ken Ono has co-edited with Bruce Berndt [PhD 1966, J. R. Smart] Volume 291 in the AMS Contemporary Mathematics Series. The volume is called “ q -series with applications to combinatorics, number theory and physics” and appeared in December 2001.

Ken Ono and **Yongbin Ruan** were both invited speakers at the AMS Central Section Meeting held in Kansas last March. Ken spoke on “The number theory of partitions: The Legacy of Dyson and Ramanujan” and Yongbin spoke on “Stringy geometry and topology of orbifolds”.

James Propp is on leave in the 2001–02 academic year and is running an undergraduate research program called Research Experiences in Algebraic Combinatorics at Harvard (“R.E.A.C.H.”). He hopes to continue with this program next academic year as well.

Arun Ram spent the Spring term (January 6 to July 6, 2001) at the Isaac Newton Institute for the Mathematical Sciences at Cambridge University in England. There he participated in the Special Program on Symmetric Functions and Macdonald Polynomials. Arun gave the Isaac Newton Institute Colloquium for the general public as representative of our program at the Institute. While on the other side of the Atlantic, he also gave lectures in Aarhus and Copenhagen in Denmark, Oberwolfach in Germany, at Seminaire Chevalley at the Institut Henri Poincaré and at the Ecole Normale

Supérieure in Paris, as well as at other institutions in England and Scotland (Cambridge, Oxford, Warwick, ...). Arun also gave talks at several international conferences including: “Centenary conference of the Thesis of I. Schur” in Gregynog, Wales; “Combinatorial and Geometric Representation Theory” in Seoul, Korea; “Conference on Algebra and Geometry” in Hyderabad, India.

Jean-Pierre Rosay is teaching and collaborating in research at the University of Grenoble during the 2002 spring semester.

Yongbin Ruan is spending the 2002–02 academic year at the Hong Kong University of Science & Technology.

The **Center for Mathematical Sciences** (CMS), the successor to the Mathematics Research Center (MRC), has now closed. Its functions and activities have merged with those of the Department of Mathematics. The Applied Mathematics Group in the department is working on plans for a program in applied and computational mathematics incorporating aspects of the main characteristics of CMS.

Last spring the **Elvehjem Museum of Art** (“LVM”) at UW-Madison had an exhibit of selected woodblock prints from its extensive and famed Van Vleck collection. Edward Burr Van Vleck, who was Professor of Mathematics in our department from 1906 to 1929, began collecting Japanese woodblock prints in 1916 and accumulated an impressive collection. When he died in 1943, his collection passed to his son John Hasbrouck Van Vleck. When the son died in 1980, the bulk of the collection was bequeathed to the “LVM” with the remainder given to the “LVM” on the death of his widow in 1984. The collection is so extensive and delicate that only a portion of them are exhibited annually. Our 9th floor conference room contains prominent portraits of the two Van Vlecks.

U.S. News & World Report

In the annual U.S. News & World Report survey of graduate programs, our program in mathematics is ranked 13th, tied with Columbia University, and our program in applied mathematics is ranked 14th, tied with Northwestern and Rice Universities and the University of Washington.

Alumni News and Comments

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

Argimiro A. Arratia G. [PhD 1997, D. Joseph] of the Mathematics Department of Universidad Simon Bolivar in Venezuela, is now Managing Editor of the "Boletin de la Asociacion Matematica Venezolana." This bulletin of the Venezuelan Mathematics Society, which comes out twice a year, was begun in 1994.

Rick Ball [PhD 1974, J. Harvey] is now Chair of the Department of Mathematics at the University of Denver.

Oliver Eng [PhD 1996, G. Benkart] has given \$5,250 to the Department of Mathematics in order to establish the "Mathematical Game and Puzzle Fund." Games and puzzles purchased through this fund are kept in a cabinet in the 9th floor conference room. Selection of puzzles and games is currently being handled by Jim Propp.

Thomas Hawkins [PhD 1968, R. C. Buck] of the Mathematics Department of Boston University has been awarded the first Albert Leon Whitman Prize by the American

Mathematical Society. This prize is given for notable exposition on the history of mathematics. The citation [Notices AMS, April 2001, 416-417] cites among many other publications, his book "The Emergence of the Theory of Lie Groups; An Essay in the History of Mathematics 1869-1926," Springer-Verlag, 2000.

Jonathan Kane [PhD 1980, A. Nagel] has been elected as Chair-Elect of the MAA/Wisconsin Section for 2001-02.

Mark Lawrence [PhD 1995, R. Brualdi] is Group General Manager, Risk Management of Australia and New Zealand Banking Group Limited (ANZ) in Melbourne, Australia. There he is responsible for ANZ's risk management framework, overseeing its global strategies, policies and processes.

Jennifer Szydlik [PhD 1995, J. Harvey] has been promoted to Associate Professor of Mathematics at UW-Oshkosh.

Send your news for next year's newsletter to the editor: brualdi@math.wisc.edu

Death Notices

Burton H. Colvin [PhD 1943, R. Langer] died on August 24, 2001. Dr. Colvin taught at the University of Wisconsin before going to work at the Boeing Aircraft Company in the early 1950's. In 1972 he became Head of the Applied Mathematics Division of the National Bureau of Standards, now National Institute of Standards (NIST) and Technology. From 1986

to 1991 he was Academic Affairs Director of NIST. He was the recipient of the Commerce Department's two highest awards, its Gold and Silver Medals. In 1980 he received the President's Meritorious Rank Award. He was also active in the Society for Industrial and Applied Mathematics and the American Association for the Advancement of Science.

Department of Mathematics Annual Fund Drive

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