

VAN VLECK NOTES:
THE
NEWSLETTER
of the
MATHEMATICS DEPARTMENT
of the
UNIVERSITY OF WISCONSIN
MADISON

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1 Fields Medal to Zelmanov

At the most recent International Congress of Mathematicians held in Zurich, in August, *Efim Zelmanov* of the University of Wisconsin, Madison was awarded the Fields Medal, the mathematical equivalent of the Nobel prize. This honor was in recognition of his brilliant work on Jordan algebras and on the Restricted Burnside Problem. Only 38 Fields Medals have been awarded since the inception of the prize in 1936.

In 1933 the physicist Pascual Jordan tried to give an algebraic formulation of quantum mechanics using what are now termed Jordan algebras. A year later Jordan and the fathers of axiomatic quantum mechanics, Eugene Wigner and John von Neumann found that the finite dimensional simple Jordan algebras reduced to the old, already-known algebras except for one 27-dimensional exceptional algebra, which was thought to be too small to be of any use in physics. Because of the discouraging lack of new structures, physicists and mathematicians looked to infinite dimensional Jordan algebras as the remedy. In 1977 when Jordan algebras were 40 years old and Zelmanov just 22, he com-

pletely determined all the infinite dimensional simple Jordan algebras with absolutely no finiteness conditions whatsoever and showed that the only exceptional algebra was the 27-dimensional one. Rather than being a disappointment to all concerned, this work contained so many clever, new ideas and techniques that its impact on the subject is now referred to as the "Russian Revolution".

A very basic question in group theory is: what makes a group finite? The English mathematician Burnside conjectured almost a century ago that a finitely generated group with m generators, such that the n th power of each element is the identity, must be finite. Eventually counterexamples were found which led to a weaker problem (the restricted Burnside problem): Among the finite groups of this type is there one of maximal order? The problem remained unsolved until Zelmanov, in a series of three extremely clever papers, answered the question in the affirmative: there are only finitely many such finite groups! It was Zelmanov's unique insights and clever use of Jordan algebras that enabled him to finish this century old problem - it is the stuff that Fields Medals are made of.

Zelmamov is originally from Novosibirsk in the former Soviet Union. When it became known, about four years ago, that he was considering leaving Russia, he was actively sought by many major universities. Madison was successful in attracting him and he has been a leader in the algebra group since that time. This year he is on leave from Madison at the University of Chicago.

2 Smell the Roses

While a Fields Medal for a Madison colleague is a first, having a football team go to the Rose Bowl is not, merely a rarity. The 21-16 win over UCLA was the culmination of a long march. After UW beat Michigan State 41-20 in Japan last fall, and was headed to the Rose Bowl, the football fever became a pandemic. The next day the stores on State street were ready with Rose Bowl sweatshirts, having started production in the wee hours of the morning. The fever pitch continued through the bowl game and the shirt trade proliferated. The sweatshirt mania produced myriad combinations of all the symbols: the 'rose', '1993', 'Bucky', 'UW', and so on. The result is that there were enough shirts to clothe a small army. If we could convince some emerging nations to use them for military attire it would take the burden off pedestrians on State street who, every few weeks over the past year have gone around mountains of leftover shirts going for ever lower prices. This year there are also several designs of sweatshirts commemorating the 15th anniversary of flamingos on Bascom Hill.

The Rose Bowl fever took a long time to subside and we were still in its grip at the time of Zelmanov's Medal. On August 3, '94 the Capital Times was still playing the Rose Bowl on the front page with an article entitled "Picking up the blitz - Rose Bowl champs all set for Chicago Media Swarm". On the 4th page there was an article entitled "UW prof wins math world's Nobel Prize". Our colleague Jean-Pierre Rosay took note of the response and pointed it out to the editor. The Wisconsin State Journal had a front page article as did the French

'Le Monde' on August 4 for their 'native sons', Pierre-Louis Lions and Jean-Christophe Yoccoz. Our own homegrown 'Wisconsin Week' didn't consider the Fields Medal first page fare and put it on on page five.

A propos of Bucky, the university has finally won its battle to have the rights to the symbol 'Bucky Badger', having finally defeated the barons of State Street. It seemed to us that all concerned could have shared the symbol, with the 'Hill' having rights to a menacing Bucky with teeth bared and the 'sweat' shops, to a meek, submissive Bucky. On the bright side, the licensing revenues will bring in money for athletics and general scholarships.

3 New Faces

As always, the department has many visitors. This year they include:

Charles Stanton, Visiting Associate Professor (Sem. 1) and Honorary Fellow (Sem. 2), from California State University at San Bernardino (Ph.D., 1982, UW-Madison, Dan Shea); *Andre Nies*, Visiting Assistant Professor (Sem. 1), from Mathematisches Institut, Universität Heidelberg; *Michael Falk*, Honorary Fellow (Sem. 1) and Visiting Associate Professor (Sem. 2) from Northern Arizona University (Ph.D., 1983, UW-Madison, Peter Orlik); *Anatol Kirillov*, Visiting Professor Sem. 1, from Steklov Mathematical Institute (St. Petersburg, Russia); *Julien Duval*, Visiting Professor (Sem. 2) from Toulouse, France; *Mirosljub Jevtic*, Visiting Assistant Professor (Sem. 2) from Belgrade; and *Steve Krone*, Research Associate, from the University of Utah.

The honorary fellows are:

Zhirue Zhang, a professor from Hebei University (China); *Jun-Soo Choa*, an assistant professor from Sung Kyun Kwan University, Korea; and *Xavier Masaneda*, University Autonoma de Barcelona. In the spring semester we'll have additional fellows: *Mohammad Ahmadi*, (PhD, UW-Madison, 1986, Bleicher), UW - Whitewater; *James Osterburg*, University of Cincinnati; and *Robin Thomas*, Georgia Tech.

This year all of our new graduate students have some kind of financial support. Most are teaching assistants, but we also now have more flexibility in providing fellowship support from graduate school funds. The incoming students and their previous institutions are: *Mehrzad Ajoodanian* - Sharif Univ. of Tech., *Joni Baker* - Ohio Wesleyan Univ., *John Brown* - Pomona College, *Eric Egge* - Carleton Coll., *Beau Grande* - Univ. of Wyoming, *Jiansheng Huang* - Univ. of Sci. and Tech. of China, *David Kung* - UW-Madison, *John Lee* (Jan. 1995) - New College of USF, *Dongfeng Li* - Chinese Academy of Sci., *Xiaohu Li* - Peking Univ., *Chengjie Liu* - Univ. of Sci. and Tech. of China, *Mark S. MacLean* - N. Carolina State Univ., *Simon MacNair* - Univ. of British Columbia, *Sangnam Nam* - Korean Adv. Inst. of Sci., *Berit Nilsen* - Pomona College., *Konstantin Pavlov* - Novosibirsk Univ., *Alexander Pikovsky* - Weizmann Inst., *Wenjun Qiu* - Shanghai Jiaotong Univ., *Lei Shen* - Peking Univ., *Maciej Smuga-Otto* - Univ. of Alberta, *Xinyi Wang* - Nankai Univ., *Yinong Wei* - Peking Univ., *Yufei Zhu* - Univ. of Sci. and Tech. of China, and *Jennifer Ziebarth* - Carleton College.

Best wishes to the new and old.

4 Honors and Awards

Panagiotis (Takis) Souganidis was an invited lecturer at the recent International Congress in Zurich in the Partial Differential Equations section. He gave a 45 minute address entitled "Interface Dynamics in Phase Transitions"

Claudia Neuhauser was among four UW - Madison faculty to receive a Sloan Foundation Fellowship.

Georgia Benkart gave an invited AMS/MAA lecture in Cincinnati at the January meetings. Her title was "A Tale of Two Groups".

Mary Ellen Rudin received an honorary degree from the University of the South, Sewanee, Tennessee, in October of this year.

5 Promotions

There were several promotions that took effect this semester. *Sigurd Angenent*, *Franc Forstneric*, *Andreas Seeger*, and *Paul Terwilliger* were promoted to full professor. Angenent works in partial differential equations and dynamical systems, combining geometrical ideas with analysis. Forstneric specializes in several complex variables and is particularly interested in its geometric and topological aspects. Seeger is a Fourier analyst who studies singular integrals and Fourier integral operators. Terwilliger is in algebraic combinatorics and studies 'highly regular' graphs, posets, or geometries using techniques from algebra.

Promoted to Associate Professor were *Robin Pemantle* and *Thaleia Zariphopoulou*. Pemantle is a probabilist, doing research on random graphs and branching structures. Zariphopoulou is one quarter in Mathematics and three quarters in the Business School. Her work is in mathematical finance and uses methods from stochastic analysis and differential equations.

Terry Millar, who works primarily in recursive model theory and who has held a half-time administrative position in the graduate school for several years, has been chosen to be the new associate dean for the physical sciences. Terry had been acting in that position for the past two years, and now officially replaces Marv Ebel, physics, the previous associate dean for the physical sciences.

6 Sabbaticals

Several of the faculty will be on sabbatical leave all or part of this academic year. *Jean-Pierre Rosay*, after spending the Spring in Grenoble, will be based this semester in Madison, with visits to Seattle; Saint-Petersburg, Russia; and Orsay, France. During the spring semester *Simon Hellerstein* will be on leave, initially at the University of Hawaii and later in Madison, researching in Complex Function Theory and looking at the current uses of technology in the teaching of Calculus. The remainder will be on leave for the whole academic year. *John Harvey* will be based

in Madison and will visit middle and high schools that make effective uses of technologies in mathematics instruction. He will also visit colleges and universities that are engaged in extensive calculus reform efforts or in innovative instructional experiments. *Martin Isaacs* will be at UC-Berkeley, mainly working on a text. *Lawrence Levy* will be a "traveling salesman" during the first semester, spending one-to-four week visits in Los Angeles (USC); Berkeley; Santa Barbara, California; Colorado Springs; Lincoln, Nebraska, and Boca Raton, Florida. During the second semester, he'll almost all of his time in Leeds, England. *Arnold Miller* will be at the University of Toronto and York University in Toronto.

7 Retirement

Millard Johnson, jointly in mathematics and engineering mechanics, retired this past June. His research work has been in continuum mechanics; in particular, he has worked on constitutive equations for visco-elastic materials. He has applied the results in lubrication theory and in the strength of materials, such as paper.

8 Obituary

It is with sorrow that we report the deaths of two colleagues, *Stephen Cole Kleene* and *Frank Forelli* in the past year.

Stephen C. Kleene, emeritus professor at the University of Wisconsin-Madison died on January 25, 1994. He was world-renowned for his work in logic, particularly as the founder of recursion theory. He was elected to the National Academy of Science in 1969 and in 1990 won the National Medal of Science, the country's highest scientific honour.

Kleene was born in 1909 in Hartford Connecticut, received a Bachelor of Arts degree from Amherst in 1930, and a Ph.D. from Princeton in 1934 under the tutelage of Alonzo Church. Kleene first came to Madison in 1935 as an instructor and in 1937 was promoted to assistant professor. During the next several years he

spent time at the Institute for Advanced Study in Princeton, taught at Amherst College, and served in the Navy, earning the rank of lieutenant commander during World War II. He returned to Madison in 1946, was promoted to full professor in 1948, and remained on the faculty for the remainder of his career. He became the C.C. MacDuffee Professor in 1964. He built up a widely acclaimed logic group in the Mathematics Department, and served as chair of the Mathematics and Numerical Analysis (now Computer Science) departments. He was Dean of the College of Letters and Science during the years 1969 to 1974, a period of financial cutbacks and student unrest.

In the summer of 1979 Stephen Kleene retired from teaching and became an Emeritus Professor of Mathematics and Computer Science. On that occasion a symposium in his honor was held at Madison. He continued his research during retirement and received further honors, including the American Mathematical Society Steele Prize in 1983 for his seminal papers of 1955 on recursion theory and descriptive set theory, and an international conference in his honor in Bulgaria in 1990.

He is survived by his wife Jeanne and his sons Bruce, Kenneth, and Paul.

Frank Forelli, Professor of Mathematics, died on September 5, 1994. He was born in San Diego, California, in 1932 and received an undergraduate degree from the University of California - Berkeley. He then served three years as an officer in the U.S. Navy before returning to Berkeley where he received his PhD in 1961 with Henry Helson. After graduation he came to the University of Wisconsin - Madison where he spent his entire career. The main focus of his research was in the properties of holomorphic functions. In particular, he used Hilbert space methods applied to the boundary values of such functions. His contributions to the field were recognized early in his career by an invitation to give an invited lecture at the International Congress of Mathematicians in Nice in 1970.

His students recall his ability to explain com-

plicated ideas in a strikingly clear manner. In recent years Frank served as departmental coordinator of the graduate program, serving over 200 students each year. During his long illness he was frequently visited by his colleagues and graduate students, as well as past graduates, attesting to his warm devotion to his departmental work. He is survived by his wife, Sally, and daughters Nicole Forelli Kresge and Justine Forelli.

9 Graduate Student News

In March, *Stephen Szydlak* was selected as an L & S Teaching Fellow for 1994. In recognition of his high quality work as a teaching assistant he was selected to lead workshops for incoming teaching assistants and received \$500 as part of the award.

Jennifer Szydlak received an Excellence in Teaching Award for 1994(\$700) from the Graduate School in a university wide competition. This was one of the announcements at the annual awards ceremony for teaching assistants, held in May. As in the previous year, *Jeanne Bleicher* arranged a delightful spread of refreshments. The chair, *Richard Brualdi*, further announced the Mathematics Department Teaching Awards (including a \$75 gift certificate at the University Bookstore). The winners were *Ben Collins, Kellie Evans, Kirk Haller, Mehdi Hoseyni Nasab, Kevin Strobel, and Zhang Dong*. Distinguished Service Awards were given to *Carl Andersson* and *Stephanie Edwards* who have been instrumental in making arrangements for visiting, prospective graduate students. Carl also did photography for the 'rogues gallery' last year. Also worthy of note is the final exam week 'Sidewalk Math' tutorial on the library mall organised by *Ben Collins* and *Garth Dickie*.

Many students received fellowships administered through the university. *Mark S. Mac Lean* of N. Carolina State Univ. received an NSF fellowship. Those on continuing fellowships are *Jennifer Carr*, National Physical Sci. Consortium; *Dolores Danneker*, National Physical Sci. Consortium; *Javier Medina*, AOF Fellowship; *Dongho Moon*, Vilas Fellow; *Michael Neergaard*,

WARF Fellowship; and *Richard Noble*, AOF Fellowship.

Graduate students *Mark Wilson* and *Golbon Zakeri* were chosen to speak at the Special Session in New Doctoral Work in Mathematics at the AMS sectional meeting in Stillwater Oklahoma in October 1994. Twelve graduating students were chosen from the Central Section of the AMS.

10 Undergraduate Student News

In May scholarship awards were announced for undergraduates. *Joon Bum Bang, Chin Li Cheung, and Christopher Paul Scaffidi* were awarded Irma L. Newman Scholarships. Professor Linnaeus Wayland Dowling Scholarships were awarded to *Christopher James Erickson, Denise Harbert, and Eric T. Mortenson*. Mr. Erickson also received the Frank D. Cady Scholarship. *Kimberly Anne Retert* and *Branislav Vasilijevic* were awarded Mark H. Ingraham Scholarships. Congratulations to these outstanding undergraduates!

This fall the the Math Club is being run by *Brent Halsey* and *Eric Mortensen*. They have had lectures by *Richard Askey* on the "Binomial Theorem and Extensions" and by *Anatole Beck* on "A Little Theory of Elections". On December 1 *Alejandro Adem* will give a lecture entitled "Groups and Geometry".

11 Alumni News

Darrah Chavey (Ph.D. 1984, Geometry, Don Crowe) has been promoted to Associate Professor of Math & Computer Science at Beloit College. (Darrah received tenure in '92, and has been on sabbatical this year spending part of his time in Madison.)

Several former undergraduate math majors have received National Science Foundation Graduate Fellowships. In mathematics they are *Laura (Ariel) Glenn* (Princeton), *Erica Plambeck* (MIT), and *Kelly Wieand* (Harvard). Two now

in physics are *Jason Maron* (Caltech) and *Mark Eriksson* (Harvard).

12 PhD Centennial, 1997

Who was the first person to receive a PhD from the University of Wisconsin and when was the degree granted? I don't expect that you know the answer or even thought about the question, but it was Henry Freeman Stecker in 1897 with a thesis "On the roots of equations, particularly the imaginary roots of numerical equations." You probably won't find any recent Wisconsin theses with a title like this first one. Unfortunately, it was never filed in the library (not possible anymore as most of you, who have successfully dealt with the graduate school, know) so we can't know what new theorems were proved by Dr. Stecker or how good the thesis was.

Who was the second person and when, and what was the thesis title? To get the answer to that question you'll have to come to the PhD Centennial Meeting in Madison in 1997! Yes, there is one being planned and it is tentatively scheduled for May 22-24, 1997. While this meeting will be an opportunity for our many former PhD students (any guesses what the total will be in 1997?) and colleagues to return to Madison, see old friends, and talk about the 'good old days,' we are planning a serious scholarly meeting with plenty of mathematics and history. We plan to invite several people to give hour talks on certain areas of mathematics that have been significantly influenced by faculty and students from Wisconsin (e.g., algebra/combinatorics, harmonic analysis, logic, probability, special functions, topology, nonlinear analysis,...) and how those areas have developed over the years. We hope to have as well, talks of a primarily historical nature. In addition, as at the 25th anniversary celebration in 1988 of the opening of Van Vleck Hall, we plan to have various minisymposia on areas related to work of faculty and former students. We are considering publishing a proceedings as a record of mathematics at the University of Wisconsin.

We will keep you up-to-date on plans in this

Newsletter and at the Wisconsin gathering at the AMS meeting each January. In the meantime, mark your calendar, and pass on any ideas on how to make this meeting the wonderful, informative, educational (and yes, nostalgic) meeting that we hope it will be. In fact, just let us know that you're interested in returning to Madison in 1997. Richard A. Brualdi

13 New Ph.D.'s

Twenty-one students received the Ph.D. degree this past year. Their names, advisors, thesis title and new locations (if known) are:

December, 1993:

Benedikt, Michael A., (Keisler, H. Jerome), "Nonstandard analysis and special ultrafilters", AT & T, Naperville, Illinois.

Chandarana, Sharad, (Wainger, Stephen), "Lp-bounds for hypersingular integrals along curves".

Huang, Guangping, (Brauer, Fred), "Models for communicable diseases with partial removal and partial recovery with immunity".

Jahn, Michael A., (Lempp, Steffen), "The index set of the cuppable sets", Univ. of New Mexico, Albuquerque.

Mohammed, Seid, (Shea, Daniel), "Regularity theorems for some function theoretic extremal problems", Addis Ababa University, Ethiopia.

May, 1994:

Cerne, Miran (Forstneric, Franc), "Analytic discs with boundaries in a generating CR-manifold", University of Ljubljana, Slovenia.

Cho, Nhansook, (Kurtz, Thomas), "Weak convergence of stochastic integrals and stochastic differential equations driven by martingale measure and its applications", Department of Mathematics Education, Seoul, South Korea.

Lanning, Scott E., (Passman, Donald S.), "The maximal symmetric ring of quotients".

Martin, Paul A., (Strikwerda, John C.), "Uniqueness of finite difference approximations to elliptic systems of partial differential equations", UW- Marathon County, Wausau.

14 The Spreading IMA

Strobel, Kevin H. (Rabinowitz, Paul), "Multi-bump orbits for a class of periodic Hamiltonian systems", Minnesota, IMA.

August, 1994:

Deckelman, Steven M. (Ahern, Patrick), "Studies of holomorphic functions having absolutely continuous boundary values on curves in the unit ball of C^n ", Wayne State College, Nebraska.

Galminas, Lisa, (Lempp, Steffen), "Lattices of enumerable algebraic structures", Northwestern State Univ. of Louisiana, Natchitoches.

Johnson, Mark J., (Miller, Arnold) "Techniques in iterated forcing", Central College, Pella, Iowa.

Leduc, Robert E., (Benkart, Georgia), "A two-parameter version of the centralizer algebra of the mixed tensor representations of the general linear group and quantum general linear group", University of North Dakota, Grand Forks.

Lee, Jongwoo, (Vanden-Broeck, J. M.), "Gravity-capillary two-dimensional free surface flows in the presence of rigid walls", Seoul National Univ., South Korea.

Leonhardi, Steven D., (Lempp, Steffen), "Generalized nonsplitting in the recursively enumerable degrees", Winona State University, Minnesota.

Letarte, Alan L., (Keisler, H. Jerome), "Covering properties on the hyperfinite time line", University of Kentucky, Lexington.

Maxwell, Thomas O., (Rabinowitz, Paul), "Periodic and connecting orbits of Hamiltonian systems"

Mellendorf, Stephen P., (Brualdi, Richard) "Hamilton decompositions of Cartesian products of multicycles", Oakland University, Michigan.

Sellami, Hichem, (Robinson, Steve), "A Nonsmooth Continuation Method", Univ. of Southern Tunisia, Sfax.

Spasojevic, Zoran, (Kunen, Kenneth), "Gaps, trees and iterated forcing", Hebrew University, Jerusalem.

Our best wishes to all of them as they begin their new careers. We hope to see them soon, perhaps at the 1997 centennial, if not before.

The University of Wisconsin - Madison has become a member of the Institute of Mathematics and its Applications, through the efforts of the chair, *Richard Brualdi*, to secure funds for that purpose. The IMA was established in 1982 by the National Science Foundation (NSF) as an instrument for interaction between the mathematics community and mathematical scientists in engineering, computer science, and statistics. Its mission is to close the gap between scientific theory and its applications. The NSF is the primary source of funding for the IMA, but additional funds are supplied by AFOSR, ARO, ONR, and NSA. Another source of funding has been the Participating Institutions (PIs) and the Participating Corporations (PCs). Until this year every major state university in the midwest with the exception of the University of Wisconsin, Madison was a member. Bellcore, Ford, General Motors, and Motorola are among the PC's.

Before UW-Madison became a member, several members of the department had played an active role in organizing areas of concentration for the IMA. In recent years *Seymour Parter*, *Thomas Kurtz*, and *Thaleia Zariphopoulou* have helped organized programs. This past summer *Claudia Neuhauser* and *Maury Bramson* organized a minisymposium on 'Phase Transitions in Catalytic Surface Reaction Models'.

In addition to activities in Minneapolis the IMA sponsors summer schools. Each year there is a one-month summer program for graduate students held on the campus of one of the PI's. This past summer the program was on Complex Analysis and was held at the University of Pittsburgh. Two students from each member institution are invited to attend. The Madisonians were *Stephanie Edwards* and *Janet Best*. In 1995 the summer school will be held at the University of Illinois - Urbana on Differential Geometry. Madison will be the site of a program 1996 on Harmonic Analysis. The organizers of the summer school will be *Andreas Seeger* and *Stephen Wainger*.

15 Talent Search

The annual Talent Search Honors Day took place on May 3rd. Many of the best problem solvers from around the state and their teachers were treated to lectures by *Daniel Klingenberg* of Chemical Engineering on "Proteins, Particles, and Parallel Computers" and by *Donald Crowe* on "Symmetries of Culture, an Unorthodox Approach to Geometry". Nineteen students were honored for achievement on the talent search problems. The winner of the Van Vleck Scholarship, valued at \$4000 a year for four years, was *Ted Kreutz* of Rufus King High School, Milwaukee. The Runner-up was *Rachael Williams* of Arrowhead High School, Hartland.

16 An International Program

Amir Assadi has been associated with the Program for International Cooperation in Mathematics and its Applications (PICMA), which successfully completed its first four-year project this past summer. This project started in 1991 with a broad base in algebra and geometry, and gradually focused on research areas in arithmetic geometry. The program included three major international workshops (Trieste 1992, Cairo 1993 and Bonn 1994) and seven regional workshops (China, Iran and Turkey.) The final part of the project was mainly sponsored through the Max-Planck Institute, May to July, 1994. More than 150 mathematicians, including 35 from developing countries, took part in this final phase. In addition, a regional workshop was held in Antalya, Turkey in July of this year, focusing on global analysis, number theory, and geometry, and including lecturers from the US and Europe as well as from Azarbaïdjan, Iran, India, Pakistan and Turkey. Madisonians participating were *Amir Assadi*, *Mike Bleicher*, *Don Crowe*, *Semra Ozturk*, *Ergun Yalcin*, and *Mehrzad Ajoodanian*.

17 Local Programs

PROBLEM SOLVING PRIZE

Each week this fall a problem has been posted conspicuously around Van Vleck for undergraduates to chew on. This is a new venture for the department, being administered by *Anatole Beck*. The student with the most correct answers at the end of the semester will win a \$75 prize in the form of a certificate to be used at the University Bookstore. In the most recent problem one is given that a transformation of the plane preserves distances when they are initially rational and one is asked to show that ALL distances are preserved.

CHAOS

ON THE MADISON CAMPUS

Bob Wilson reports that following on the Symposium on Chaos and Complexity held in 1993, a new seminar series on Chaos and Complex Systems began this fall, and meets each Wednesday noon in 1313 Sterling. *David Griffeath* and *Bob Wilson* of the Mathematics Department have been part of the interdepartmental organizing committee for this seminar. Others are *Blake LeBaron*, Economics; *Clint Sprott*, Physics; and *Ian Dobson*, Electrical Engineering.

Topics and speakers are expected to come from many different fields. The seminar will be interdisciplinary, bridging many traditional boundaries, and people from all disciplines are invited to participate. Planned topics include Nonlinear dynamics, Chaos/Bifurcations, Time Series Analysis, Cellular Automata, Neural Networks, and Genetic Algorithms. Speakers this fall from the Mathematics Department have included *Joel Robbin* on Symbolic Dynamics, *Dietrich Uhlenbrock* on Chaos Software, *Fred Brauer* on Population Dynamics, and *David Griffeath* on Cellular Automata. The seminar has also included speakers from the Sante Fe Institute, from other departments on the Madison campus, and from around the state, covering material from the theoretical to the applied.

MaCE TRAINEESHIPS

Traineeships are still available in the National Science Foundation funded program in Mathematics And Computation in Engineering (MaCE). The MaCE program provides students with the opportunity to pursue graduate study

in areas at the interface between engineering and the mathematical sciences. Students combine study in an area of engineering with related areas of the mathematical sciences. Work in the engineering area and in the mathematical sciences along with computational and other skill development are directed at preparing the student to develop mathematical models of phenomena in the application area, to analyze the models and their implications using a broad array of existing mathematical methods and computational tools, to develop new methods as needed, and to communicate the findings.

Please encourage students with strong backgrounds in mathematics and the physical sciences to apply. For further information e-mail kurtz@math.wisc.edu or write

MaCE

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SUMMER INTERN PROGRAM IN PROBABILITY AND STOCHASTIC PROCESSES

The intern program brings ten recent PhD recipients in probability and stochastic processes to Madison for the summer. The objective of the program is to stimulate and enhance the scientific development of capable young researchers. Last summer's program was organized by Maury Bramson, David Griffeath, Claudia Neuhauser, and Robin Pemantle and focused on probability theory and its application to mathematical physics and biology. Geoffrey Grimmett (Cambridge University), Gregory Lawler (Duke University), and Simon Tavaré (University of Southern California) were featured speakers.

Funding for the program for the past three years has been provided by NSF and a proposal to continue the program is pending. If the proposal is funded, next summer's program will be organized by Peter Ney and Michael Newton (of the UW Statistics Department) and will focus on Markov chain Monte Carlo. If you know young probabilists who might be interested, have them contact or e-mail kurtz@math.wisc.edu.

Probability Intern Program
Center for the Mathematical Sciences
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WITH PROBABILITY ONE

A conference is being planned to commemorate *Peter Ney's* 65th birthday. Plans are in the initial stages and it is expected to be held in early July, 1995. If you would like more information, contact Tom Kurtz (kurtz@math.wisc.edu) or at the address in the previous item.

18 Letters

Here is a peek at 'life after PhD' from *Jenny Quinn* who graduated in 1993.

An Occidental Experience

With a new degree and a new job, I have been establishing a new life in the City of Angels as an Assistant Professor of Mathematics at Occidental College. Occidental is a selective liberal arts college in Los Angeles, California. We are a community of 1600 students, 144 faculty, and assorted staff and administrators. We take great pride in our commitment to excellence and equity.

Being a smaller school, Oxy has afforded me the opportunity to be truly involved. The math department here was on the Calculus Reform bandwagon long before I arrived. But my ideas on teaching and reform were taken seriously - even though I had not yet proven myself to the 9 other members of my department. A year later, some of those ideas have grown into the basic format of the Calculus sequence.

Curriculum development has been a focus 1994-95 because it is our fledging year on a semester calendar. The change-over has not been so dramatic for me since I spent only one previous year on terms, but every course has been reevaluated and reworked based on our students' needs under the new system. Many changes have occurred including offering an unconventional class format of directed seminars. In a directed seminar, the students are provided with a topic background and outline. Then they must prepare the

lectures to teach one another. So far, so good.

Like many other small colleges (except for those few well-endowed institutions with great name recognition that shall remain nameless), Occidental is experiencing a budget crunch. I was impressed by how quickly the faculty mobilized to guarantee that any budget cuts don't negatively impact the academic quality of the institution. I try to keep well informed as to the state of the college. Luckily, mathematicians are a powerful force in governance since both the Faculty Council President and an Assistant Dean of Faculty are from my department. Between these sources and my appointment to the Subcommittee on Finance, I know more about the workings and politics of this place than I could have hoped for. I'm confident we will come through this crisis stronger than ever.

One drawback in being here is the difficulty in finding time to get research done during the academic year. There are so many other demands - from students to committees (including a hiring committee) - that research gets put off until vacations and summer break.

I feel quite fortunate in my circumstances. I love my job, I am appreciated for what I do, and I can affect the things around me. I am a firm believer in the local saying, "It is not accidental to choose Occidental."

19 The Rest of the News

Richard Askey gave an invited talk at the British Mathematical Colloquium in March and a *Stieltjes Memorial Lecture* at the Dutch Mathematical Society meeting in April. Both referred back to 1894. The first was titled "q-series work of L.J.Rogers as seen in 1894 and 1994". The second was in memory of *Stieltjes*, who died in 1894, and was titled "Some work of *Stieltjes* as we see it now".

Mary Ellen Rudin and *Walter Rudin* have written their first ever joint paper, 'Continuous functions that are locally constant on dense sets', to be published in the *Journal of Functional Analysis*.

David Wiegand, the son of *Roger* and *Sylvia*

Wiegand, and grandson of *Elizabeth* and *L. C. Young*, was the runner-up in the *National Scrabble Championship*, this past year, winning \$7500. Adding to a letter on the board, he cleaned out his letters by spelling 'azoturia'. His opponent challenged the word, but it does exist and pertains to horses with an excess of nitrogen in their urine. I hope we've expanded your vocabulary.

Does a marathon sound too taxing? *Stephen Szydlak*, a graduate student, really prefers a longer run, the ultra-marathon. This past May he was the winner in the *Ice Age 50 Mile Run* which took place in the southern *Kettle Moraine of Wisconsin*. His time was 6 hours, 9 minutes, and 56 seconds. In December he and his wife *Jennifer*, also a graduate student, will be flown to Texas where he will compete in the *Sunmart Texas Trail Run*. Last year he completed the 50 mile course in 5 hours and 50 minutes to finish second.

A dinosaur egg laid 70 million years ago in *Hubei Province, China* has been donated to the *Geology Museum* by *Claudia Neuhauser*. Next time you're in *Madison* you can have a look at the cantaloupe sized egg along with a remarkable collection, including dinosaur skeletons. The museum is in *Weeks Hall* and is worth a detour, for locals as well.

20 New Results

On March 7, 94, *Roland Fredrick Koepf* was born to *Kelly* and *Warren Koepf*.

On May 10, 1994, *Deborah Johnson* gave birth to a girl, *Sydney Frances Johnson*.

Wenchao Huang and *Ying Chen* have a new daughter, *Tammy X. Huang* born on June 9, 1994.

Gloria Mari-Beffa and *Sigurd Angenent* have a son, *Nicolaas Manuel Angenent Mari*, born June 23, 1994.

Greg and *Tina Spradlin* had a girl, *Alexandria Abigail*, born July 6, 1994.

Paul and *Barb Fishback* have a new daughter, *Margaret Joan*, born September 17, 1994.

Just arrived - *Fariba* and *Amir Assadi* had a daughter, *Kimia Zahra*, on November 23, 1994.

21 Uplifting Thoughts

The Van Vleck elevators have been the subject of much discussion over the years. They might be worthy of a miniseries on life in the modern age. Near the beginning of the current fall semester the one to the north began to be temperamental, stopping 5 or 6 inches above the floor level. Ann Caruso dutifully posted a sign noting the the elevator was out of order. A couple of fellows from the elevator company, their belts bulging with an impressive array of fancy tools, came to the rescue. The sign was taken down later that day. The next day the same elevator was missing the floor. A sign went back up, the big fellow came back, the problem was ostensibly overcome and the sign came down late that afternoon. This ritual was repeated several times over a period of what seemed like two weeks. We know of at least one full leg brace that was attributable to the 'dislivello'. An order for a plastic 'out of order' sign seemed reasonable. Then one day the bulging belts seemed to have won. At about the same time we noticed something new. The elevators had new numbers pasted on them. That to the south was #1 and that to the north was #2. Perhaps the elevators of Van Vleck Hall had been protesting, merely seeking recognition.

Shortly thereafter the drinking fountain on the 7th floor started leaking, creating slippery and hazardous conditions well before the onset of winter. A few calls to 3-3333 produced a dry floor and no leaking. However, a week later the floor under the fountain was wet again. The solution seems obvious.

22 Meet you in San Francisco

The Fifth Annual Wisconsin Reunion will take place at the joint AMS-MAA meetings in San Francisco on Friday, January 6 from 6:00 to 8:00 p.m. in the Corintia Room of the Parc 55 Hotel (across the street from the headquarters hotel). As usual there will be hors d'oeuvres and

a cash bar, with a \$5 contribution at the door requested to help defray the costs. Last year we had a great time in Cincinnati with more than one hundred Wisconsin friends. Since San Francisco is such an attractive city to visit, we hope to see many more this January. Come and share with others what's been going on with you and your institution - new theorems, curriculum initiatives, experimental instructional formats, etc. The reunion gives everyone a wonderful opportunity to renew old friendships and begin new ones. If you're in San Francisco, don't miss the Wisconsin Reunion. Richard Brualdi

23 Memorial Funds and Contributions

Each year many people make contributions to the UW-Madison Mathematics Department. We are very grateful to those who have done so. This year, in addition to welcoming contributions for general mathematical activities, we invite you to contribute to one of two new memorial funds and an existing fellowship fund.

The first is the Wolfgang Wasow Memorial Fund, established through a generous gift from the children of Wolfgang Wasow. The fund will be used to sponsor The WOLFGANG WASOW LECTURE SERIES IN MATHEMATICS. The series will be the first of its kind for the Mathematics Department at Madison and fills a long-standing need. Lectures will initially be in fields related to Wolfgang's research interests. In later years the fund will also be used to promote other activities, such as scholarships and travel grants for mathematics graduate students. His children invite contributions to the fund so that it can be a lasting tribute to their father and promote graduate study at Madison.

This fall the Mathematics Department established a Stephen Cole Kleene Memorial Fund in his honor. It is planned to use the fund to promote the logic program at Madison and particularly to give research grants to graduate stu-

dents. This fund has no initial endowment and will depend entirely on contributions.

We would also like to make you aware of an existing fund established by *Betty Hirschfelder*. She earned her PhD in Mathematics from UW - Madison and was an Assistant Professor in the Mathematics Department from 1948 to 1954. In 1992 she gave a gift to the university to establish a fellowship fund to aid women in their studies of mathematics, physics (recently added), and chemistry.

The Mathematics Department welcomes and appreciates your support in its fundraising efforts and the support of your employer, should it have a policy of matching funds. To make a contribution, make it payable to one of the following:

Mathematics Department Fund

Wolfgang Wasow Fund

Stephen Cole Kleene Fund

Elizabeth Hirschfelder Fund for Women in Math, Physics, and Chem.

and send to

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

24 Database

We are in the process of establishing a database for people who have had some connection with the Mathematics Department. If you received this, we obviously have some information, probably incomplete. We would appreciate your correcting any incorrect data and giving us a complete set on your home, business addresses, tel. numbers, email, degree date (if applicable), advisor, AND some news if you can. Email or mail to Bob Turner, who prepared this newsletter 'with a little help from my friends'.
turner@math.wisc.edu

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