Department of Mathematics

Fall 1999 Newsletter

IN THIS ISSUE

A MESSAGE FROM THE CHAIR

Motohico Mulase

It is my pleasure to send you the Sixth Annual Department of Mathematics Newsletter.

This past year has been a transitional year in many ways. Three tenured faculty members left the Department, three new faculty members joined, and we welcomed three new staff members. Throughout the year the Department members (the faculty, students, and the staff) worked hard resulting in many achievements. I hope you feel the excitement of our activities in this issue.

Professor Henry Alder, Editor in Chief, has done another fantastic job to publish the Newsletter. Please join me in thanking him and his Editorial Board members for this wonderful issue.

Henry Alder Gives $100,000 to the Department

The Department has received a generous gift from Henry Alder, Professor Emeritus of Mathematics, a long time faculty member, and former Chair of the Department.

He has made a gift of $100,000 to establish an endowment for the Department of Mathematics to be used primarily for an annual prize of $2,000 for the graduate student who is deemed to be the top teacher among all the graduate students in mathematics. The award is to be known as the Henry L. Alder Prize for Excellence in Teaching. There was such an award in the department many years ago, but it was abandoned when the campus instituted a similar award for the best teaching performance by graduate students on the entire campus. At most ten such awards are given each year, but such an award only rarely goes to any one particular department. A graduate student in mathematics has received it on a few occasions, but infrequently. Reinstating this prize in mathematics will have the effect of demonstrating that good teaching is valued in the Department, and that it has its rewards.

The prize is expected to enhance recruitment and placement of our graduate students. The Department already has two other endowments for graduate programs.

The $10,000 W. K. Schwarze Scholarship is for those who plan to teach at the pre-college or undergraduate level, and the $1,000 A. Leung Prize is granted to one or more qualified students in mathematics who have shown exceptional promise in all aspects of mathematics including research, scholarship, and teaching. The Alder Prize complements the existing awards, and encourages our graduate students to receive high quality preparation for teaching. Such education will certainly increase the opportunity of better employment of our graduate students in academe, education, and other areas where communication and teaching skills are important.

Any excess funds available after the Alder Prize is awarded may be used, at the discretion of the Department Chair in consultation with the Undergraduate Program Committee, in any way they consider appropriate in order to enhance the quality of undergraduate teaching in the Department.

A reception in honor of Professor Alder, hosted by Dean Peter Rock and College Relations, will be held in Kerr Hall on October 14, 1999, at 4:00 p.m.

Profile of Professor Alder

Henry L. Alder received his Ph.D. from Berkeley in 1947. After spending a year on the faculty in the Department of Mathematics at

UC Berkeley, he joined the Davis faculty as an Instructor of Mathematics on July 1, 1948. He advanced to the rank of Professor in 1965, and officially retired from this position in 1992. He then served as Department Chair for 1992-94. Since his retirement, Dr. Alder has continued to teach one to three quarters every year. His Number Theory course, MAT 115ABC, has been one of the most successful courses the Department has ever offered.

Dr. Alder has always been a strong advocate for quality teaching. He won the Davis Division Academic Senate Distinguished Teaching Award in 1976, and received the Lester R. Ford Award of the Mathematical Association of America for his expository writing in 1970. During his tenure as a faculty member in Davis, Dr. Alder served in numerous important public and professional offices to promote mathematics education and quality teaching. For

1977-79, he served as President of the Mathematical Association of America, and in 1982-85, he was a member of the State Board of Education. His service to the MAA was honored in 1980 by his receiving its most prestigious award, the *Award for Distinguished Service to Mathematics*.

A tree planting ceremony to celebrate his 50 years of service to the Davis campus, and to thank him for his excellent contributions to the Department and his profession, is scheduled to take place this fall.

New Faculty

Mikhail Khovanov was born in 1972 . He obtained his undergraduate degree from Moscow State University in 1991 and his Ph. D. from Yale University in 1997. He then held a 2-year visiting position at the Institute for Advanced Study in Princeton, NJ.

Mikhail's work is in a relatively new area of mathematics called quantum algebra. Although the area had various precursors going as far back as the 1930's, it came into its own only in the 1980's with the discovery of the Jones polynomial; it was recognized with three Fields Medals in 1990. Mikhail's recent papers partially extend the topological applications of quantum algebra from three dimensions to four in a dramatic new way. He also has an array of side results in other topics in topology, ranging from curves in the plane (doodles) to hyperplane arrangements in vector spaces.

Besides his research in mathematics, Mikhail plays the cello, and he is interested in literature and in *anime* (Japanese animation).

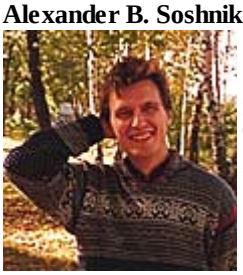
Understanding nonlinear hydrodynamics of ocean waves and oceanography makes you a better surfer. Proof: Look at **Professor Steve Shkoller** (pronounced *Skoller*). A one-time competition surfer, he joined the Department this year from the California Institute of Technology and Los Alamos National Laboratory, where he was Director's Postdoctoral Fellow for 1997-99. The life of Dr. Shkoller, a native of San Diego, has always been centered in southern California until now. He received his entire education in the San Diego area, including his Ph.D. from UCSD in 1995. His first job was at the Scripps Institution of Oceanography as a Green Foundation Postdoctoral Scholar in computational mathematics.

Dr. Shkoller is an analyst working on infinite-dimensional geometry and nonlinear partial differential equations. He has made essential contributions in the recent development of *multisymplectic Lagrangian field theory*, which has been applied to obtaining a better discretization of various nonlinear PDEs. But his truly astonishing results, which he also likes the most, are in the area of geometric analysis of diffeomorphism groups of Riemannian manifolds. Dr. Shkoller generalized the famous result of V. I. Arnold on the relation between the Euler equation of fluid dynamics and the infinite-dimensional group of volume-preserving diffeomorphisms of a Riemannian manifold.

He had the opportunity to join Berkeley and other prestigious institutions. To the interviewer's question why he chose Davis over the other places, he mentioned first our nice faculty here, who are trained in strong pure mathematical techniques and are interested in applied mathematics. He then added, "And it wasn't hot when I interviewed in Davis in January."

Dr. Shkoller lives in Davis with his wife, Yana, a professional nurse, and two dogs, Taymyr and Nika. They plan to host an open house for mathematical discussions *every Friday evening*. He also wishes to start the *UC Davis Surf Team*. Nobody makes waves in Davis, but he has found a fantastic surf break, Chronkite, in the San Francisco Bay area.

With his KDI Grant from NSF, Dr. Shkoller is planning to launch a postdoctoral research program in geometric analysis in Davis. If you are interested in either this position or the Surf Team membership, please contact him for details. Or, just join us at his open house!



Alexander B. Soshnikov was born in Kursk, Russia in 1969 and graduated with distinction with a Bachelor of Science degree in 1991 from Moscow State University. From there he went to Princeton University where he received a Ph.D. in Mathematics in 1997 under the thesis supervision of Professor Yakov Sinai. He then spent one semester as a member of the Institute for advanced Study and afterwards took his current position as an Olga Taussky-John Todd Instructor at Caltech. Dr. Soshnikov joined the UC Davis faculty this past July 1, but will complete his instructorship at Caltech before moving to Davis.

Dr. Soshnikov works in probability theory with strong interests in analysis and mathematical physics. His

thesis, which was published in the prestigious *Annals of Mathematics*, dealt with generalizations of the central limit theorem (bell-shaped curve) in the context of random matrix theory. He has pursued these interests in random matrix theory and has recently established that a wide class of random matrix models, called Wigner matrices, lie in the same universality class as that of the corresponding gaussian matrices at the edge of the spectrum. This result, proved using both probabilistic and combinatoric methods, is a fundamental result in random matrix theory and is expected to have far reaching consequences for this area. In addition to his work in random matrix theory, Dr. Soshnikov has studied both Anderson localization and Schrödinger operators, both fundamental areas of research in mathematical physics.

At Caltech Dr. Soshnikov has taught the undergraduate classical analysis course as well as graduate seminars on random matrices. He has lectured widely on his work giving invited lectures at places such as the Mathematical Sciences Research Institute program entitled Random Matrix Models and Their Applications this past spring, at the AMS Summer Research Workshop in Mt. Holyoke, and at the AMS Sectional meeting in Tucson.

He recently sent us the following information about himself. "I am writing back from Oberwolfach, Germany where the conference on Random Systems is taking place. The most interesting personal information is that I am going to get married in Moscow on September 11. My future wife Evgenia (Eugene) works for the telephone company in Russia. Actually these weeks are her last weeks on the job since she will join me in the US by the end of September. My main hobby is swimming - I go to the pool every day! I like to see new places - the most memorable trip I made this summer was to Rio de Janeiro, Brazil."

Albert Fannjiang and Alex Mogilner Receive Tenure Promotion

Alexander Mogilner's *elastic Brownian ratchet model* is well known among mathematical biologists, which he developed with Professor George Oster of UC Berkeley. This model is now considered as a standard model for the motion of microorganisms, such as bacteria, in fluid.

How a bacterium can move toward its desired direction, while it is randomly hit by water molecules and its motion continuously disturbed? In such an environment, only a Brownian motion can be expected.

Alex analyzed the motion of the head part of a micro-organism against its long tail. When the head moves away from its tail by Brownian motion, a monomer locks in between the head and the polymer tail, which blocks the head from going back. Thus the head moves in one direction. Alex has been able to show that their model completely explaines the experimental data, thanks to his ingenious ideas and strong mathematical power that enabled him to solve nonlinear equations for an interacting polymer with infinitely many degrees of freedom.

Albert Fannjiang surprised mathematicians and physicists as well with his mathematical proof of the theoretical existence of a fluid with long time memory.

When a strong turbulent force is applied to a fluid, it becomes a random fluid. A small particle placed on this fluid *should* move randomly, with a trajectory similar to a Brownian motion. Albert showed that in many cases the intuition is not always true. For a large class of fluids, the macroscopic behavior of the high turbulent limit of these fluids has a universal property, which he calls *fractional Brownian motion*. A characteristic feature of this limiting fluid is that it has an infinitely long lasting memory: when a test particle makes a motion to a certain direction, then, unlike the case of Brownian motion, it remembers the initial direction, and tends to go to the same direction all the time.

Albert and Alex are also excellent teachers, and have served on important committees of the Department. With their strong contributions, they received tenure promotion this year. Congratulations, Albert and Alex!

Dr. Zhaojun Bai Receives Courtesy Appointment

Professor Zhaojun Bai of the Computer Science Department received a joint appointment in the Department of Mathematics effective July 1, 1999. Dr. Bai is an expert on numerical linear algebra, and his software, LAPACK, is highly regarded in the scientific computation community. Dr. Bai joined the Davis campus this year from the University of Kentucky, where he was an Associate Professor of Mathematics.

The Mathematics Department is committed to increasing its excellence in scientific computation through the campus wide *Computational Science and Engineering Initiative*. Dr. Bai's joint appointment is made possible by the coordination of the Division of Mathematical and Physical Sciences and the College of Engineering.

Please join us in welcoming Professor Bai to the Davis campus.

Workshop on Variational Analysis

A "Workshop on Variational Analysis and Related Topics" (this year's focus: Hamilton-Jacobi-Bellman theory) was organized by Art Krener and Roger J-B Wets and held in Davis Feb. 25 -- Feb. 27, 99. The lecturers came from Université de Paris, Universidad de Chile, Moscow State University, University of Washington, and University of California (Berkeley, Davis, Los Angeles, and Santa Barbara). This was the 6^{th} in a series of almost bi-annual meetings devoted to Variational Analysis that started in Davis in 1988; the second and fourth in this series were held at the University of California, Santa Barbara.

Tom Sallee Receives Distinguished Public Service Award

Tom Sallee was one of two recipients of last year's Distinguished Public Service Awards presented by the Academic Senate of the Davis campus.

Tom Sallee has been deeply involved in working with teachers to improve mathematics instruction for 30 years working directly with well over 100 teachers and influencing many hundreds more through the Miller Mathematics Program, the Northern California Mathematics Project, and more recently with College Preparatory Mathematics, a high school curriculum development and assessment project.

The Committee that recommended Tom Sallee for this prestigious award stated that it was "proud to be able to honor Professor Sallee with this recognition for his achievements that were best summarized by one evaluation that admonished our committee 'to grab the opportunity to honor this man. Please let him know that what he has given is truly appreciated and that his influence has reached far and wide and his dedication to people and learning is praiseworthy.'"

Faculty Members Continue to Win Federal Research Grants Totaling $2,800,000.

The Department faculty members are continuously successful in obtaining several federal grants for their research. As of September 1999, 20 faculty members have active research grants from federal agencies, of which 18 are Principal Investigators of research grants from the National Science Foundation, the Department of Energy and/or the Air Force Office of Research. Two other faculty members are Co-PIs of NSF grants. The total budget of the awards allocated to our faculty members' research activities exceeds $2,800,000 for the duration of these grants.

The federal research grants in mathematics are extremely competitive these days. The Department is proud of the great success of the following faculty members. Angela Cheer (NSF), Albert Fannjiang (NSF), Janko Gravner (NSF), Joel Hass (NSF), John Hunter (NSF), Arthur Krener (AFOR, NSF), Greg Kuperberg (NSF), Alexander Mogilner (NSF), Motohico Mulase (NSF), Bruno Nachtergaele (NSF), Gerry Puckett (DOE, NSF), Naoki Saito (NSF), Albert Schwarz (NSF), Steve Shkoller (NSF), Thomas Strohmer (NSF), Blake Temple (NSF), Abigail Thompson (NSF), William Thurston (NSF), Craig Tracy (NSF), and Roger Wets (NSF).

Campus Nominates Naoki Saito for Packard Fellowship

Every year the UC Davis campus is invited to nominate only two faculty members for the prestigious David and Lucile Packard Fellowship. This year **Professor Naoki Saito** won the campus nomination.

Dr. Saito's research expertise is in wavelet theory and its applications to signal and image processing and mathematical analysis.

Duane Kouba Honored

Dr. Duane Kouba received the 1999 Prize for the Outstanding Teacher of Lower Division Mathematics from Professor Peter Dale, Vice Provost for Undergraduate Studies, at the annual Departmental Awards Ceremony on June 3, 1999.

He was unanimously and enthusiastically recommended by the selection committee as a truly gifted and dedicated instructor for the 1999 Award. He has been an important person in the teaching of the lower-division curriculum for several years.

Dr. Kouba's students overwhelmingly praise his teaching: "He is an outstanding teacher and a wonderful human being. He is a real credit to the math department." "He did a phenomenal job in the course. He's the best math teacher I've had here at Davis." "He is the best and most interesting math teacher I have ever had." "I loved how you teach, very unintimidating and clear." "GREAT!"

Dr. Kouba runs Emerging Scholars Program. Not only did he receive almost perfect student evaluations in these courses during the previous year, but the students taught in this Program routinely do extraordinarily well in calculus, thanks in large part to the problem sets that he has created and the positive atmosphere he brings to the classes. As if that were not enough, he donated his time as the assistant coach for the Aggie basketball team that won the national championship. The Department of Mathematics takes great pleasure in presenting the award to Dr. Kouba.

Please Visit Our Calculus Homepage

An interactive homepage devoted to calculus has been developed by Professor Joel Hass and Dr. Duane Kouba. Please visit *Calculus.org: The Calculus Page* at

http://math.ucdavis.edu/~calculus/.

Four Visiting Research Assistant Professors Join the Department

by Allan Edelson

Since 1988 the Department has offered a number of visiting research assistant professor (VRAP) positions for new Ph.D.s. These positions were created in order to provide an opportunity for recent graduates to continue their programs of teaching and research here at Davis. Of equal importance the program was seen as a mechanism for providing our department with a group of talented, young scholars working in research areas in which our Department has strong research interests. Generally VRAPs have research interests in areas well represented by our faculty here at Davis. This provides an opportunity for close collaboration between VRAPs and our faculty, and in some cases our graduate students. Currently we have visitors working in Mathematical Physics, Numerical Mathematics, Partial Differential Equations, Topology and Geometry.

This program has been quite successful in promoting collaboration between VRAPs and faculty, and in placing VRAPs in faculty positions after their stay as visitors here at UCD. The first VRAP, Adolfo Rumbos, was a graduate of UCSC. spent three years as a VRAP, and now is an Associate Professor at Pomona College in Claremont. Other VRAPs have been appointed at institutions such as University of Tokyo, Louisiana State University, Vassar College, CSU Fresno, CSU Monterey, Oxford University, University of Vienna, Florida State University, and Occidental College. Several VRAPs have chosen positions in industrial environments. We would encourage graduate students to get to know our VRAPs, particularly those working in research areas close to their own.

Dr. Jean-Marie Aubry, who has been working as a postdoctoral researcher with Professor Naoki Saito on fatigue fracture classification problems since Oct. 98, will serve as a VRAP in 1999-2000. Jean-Marie is a graduate of École Polytechnique in Paris, and received his Ph.D. in 1998 from École Normal Superieure de Cachan under the supervision of Professor Stephane Jaffard. His research interests are wavelets, multifractals, fractal geometry, and their applications. He has a superb array of hobbies, including playing the clarinet, practicing fencing, and reading a variety of books.

Dr. Grant Galbraith was a student at Imperial College, London, and received his Ph.D. at the University of Washington in Seattle. His thesis advisor was T. Rockafellar. His research is in optimal control and nonsmooth analysis. During his time at Davis Dr. Galbraith will be working closely with Roger Wets.

Dr. Kevin Hartshorn was a student of Andrew Casson, at UC Berkeley. His research interest is in Geometry/Topology, and he has publications on Heegard splittings and on finite actions on tangent bundles. He will be working with Joel Hass.

Dr. Vinay Kathotia was a student at India Institute of Technology and received his Ph.D. at UC Berkeley. His research advisor was Allan Weinstein. His research is in the area of symplectic topology and algebra. He will be working with Motohico Mulase.

News From the Graduate Program In Mathematics

by Allan L. Edelson
Vice Chair for Graduate Affairs

This year the Mathematics Department announces the arrival of twenty new graduate students. We are glad that they have elected to join us, and we encourage all of the current graduate students to welcome them to the Department.

Entering the Pure Mathematics program are: Laimi Cong-Huyen (Analysis), Thomas Craven (Topology), Jennifer Fawcett (Topology), Nicole Hoover, Jeffrey Lacks, Corey Linsmeyer, Max Roy McCoskey (Math. Physics), Sang Hyoun Pahk, and Shane Waggoner (Analysis/Geometry).

Entering in Applied Mathematics are: Bradley Boone, Christopher Dugaw (Mathematical Ecology), Thomas Hoft, Li Lei, Nicole London, Sonja Radelow (Mathematical Biology), Rebecca Schram, Hanan Souki (Mathematical Biology), and Noe Valenzuela-Campos.

New arrivals in the MAT program are: Susan Kingston, Gratia Ann Oakley, and R'lyeh Schanning.

Our congratulations go out to those graduate students who have received advanced degrees since the Fall of 1998.

The M.A. in Mathematics was awarded to **James Peirce**, who is continuing his graduate studies for a Ph.D., working in Partial

Differential Equations.

The MAT was awarded to **Andrew Johnson** and **Ivan Miller**. Ivan is a Mathematics instructor at Calistoga Joint Union School District, Calistoga, CA. Andrew is a Mathematics Teacher at East Union High School, Manteca, CA.

Eric Lau was awarded a M.S. in Mathematics. Thesis: Linear Flutter Control of a Two-Dimensional Airfoil. He is a Computer Science/Mathematics Specialist, programming satellite software at Raytheon in Denver, CO.

Long Li received an M.S. in Applied Mathematics. Thesis: Normal Forms of Controllable and Uncontrollable Discrete Control Nonlinear Systems. He is continuing graduate studies for a Ph.D. at Purdue University.

Curtis Feist received the Ph.D. in Mathematics. Thesis: Results on Thin Position. He is an Assistant Professor at Marshall University, Huntington, WV.

Lisa Korf received her Ph.D. in Mathematics, Sept. '98. Thesis: Approximation and Solution Schemes for Stochastic Dynamic Optimization Problems. Lisa is a VIGRE Post-Doctoral Researcher at the University of Washington, Seattle, WA.

Jorge Pinzon received a Ph.D. in Applied Mathematics, Sept. '98. Thesis: Imaging Spectrometry and Image Registration: A Singular Value Decomposition and Wavelet Based Learning. Jorge is a Research Associate in Biospheric Sciences at NASA Goddard Space Flight Center, Greenbelt, MD.

Richard Vaughn received a Ph.D. in Mathematics, Sept. '98. Thesis: Planar Soap Bubbles. He is a faculty member at Paradise Valley Community College, Phoenix, AZ.

John Wagner received a Ph.D. in Applied Mathematics, Dec. '98. Thesis: A Mathematical Model of the Fertilization of Ca2* Wave in Xenopus Laevis Oocytes. John is a Post-Doctoral Fellow at the center for Biomedical Imaging Technology, University of Connecticut Health Center, Farmington, CT.

New Directions for the Graduate Program in Applied Mathematics

by E. G. Puckett
Chair of the Graduate Group in
Applied Mathematics

Over the past several years the Graduate Group in Applied Mathematics (GGAM) has been expanding opportunities for graduate students and postdocs to conduct interdisciplinary research work while pursuing their degree in Applied Mathematics. Students now have the opportunity to spend some of their time as interns in one of several industrial research laboratories, work at one of the National Laboratories as graduate student research assistants, or participate in the Research Training Group (RTG) "Nonlinear Dynamics in Biology." One of the benefits of participating in one of these programs is that the student has the opportunity to interact with and learn from top researchers in disciplines outside mathematics. In addition to providing a fertile source of research problems, knowledge gained in this manner broadens and strengthens the student's grasp of applied mathematics. Industrial internships and national laboratory positions also provide students with the opportunity to experience first-hand a non-academic work environment. Not only does this provide students with more information upon which to make future career choices, but it also strengthens the vitae of those students who choose to pursue academic careers.

Some students who have taken advantage of these opportunities are mentioned below. **Robert Walston**, who is finishing his first year in the Applied Mathematics Ph.D. program, is spending five weeks as an intern at the Xerox Corporate Research Center in Webster, NY. **Matt Williams** has spent the last two years as a Graduate Student Research Assistant in the Materials Science and Technology Division at the Los Alamos National Laboratory. Matt's Ph.D. thesis is on computational models of molten metals, and this work experience has been an important part of his thesis research. Matt expects to finish his thesis this year. **James Pilliod**'s Ph.D. thesis in 1996 was closely related to research being conducted in the Center for Computational Sciences and Engineering (CCSE) at the Lawrence Berkeley National Laboratory. Upon graduation, Jim spent two years as a postdoc with CCSE. He is now working for a high tech company in the Bay Area.

These opportunities are not limited to graduate students, but are also available to undergraduates and post-doctoral researchers. For example, **Eugene Sy**, spent the summer of 1996 as a summer intern at the Los Alamos National Laboratory. Eugene graduated in 1997 with a BS in Mathematics and is now a graduate student at Stanford University. **Thomas Rutagania**, who finished his Ph.D. thesis in

1997 is now employed as a postdoc in the Center for Applied Scientific Computing (CASC) at the Lawrence Livermore National Laboratory. Part of Thomas's work involves assisting researchers in the RTG and the Institute for Theoretical Dynamics apply software developed at CASC to model problems in Biology. Finally, during their time as UCD postdocs **Mark Sussman** and **Igor Aleniov** interacted closely with researchers at Xerox Corporation and MicroFab Technologies. Igor spent the 1997-98 academic year at the Xerox Corporate Research Center in Webster, NY, while Mark spent approximately eight weeks there, spread out over several years. Igor is now a staff scientist at the NASA Goddard Institute for Space Studies at Columbia University and Mark is now a tenure track Assistant Professor in the Mathematics Department at Florida State University (FSU) and a member of FSU's Center for Scientific Computing and Engineering.

A request from the GGAM Chair to all GGAM Alumni

We would like to have current contact information for all of our graduates so that we can advertise our success and to inform prospective graduate students what our graduates do upon leaving the program. We'd be grateful if you would send your current email address, web page URLs (if any) and other contact information using the Update Form located at the end of this Newsletter.

W. K. Schwarze Scholarship Awarded to Michael Casey

At the annual Department Awards Ceremony on June 3, 1999, the Department awarded the William Karl Schwarze Scholarship in Mathematics to **Michael Casey**. The presentation was made by Dr. Peter Rock, Dean of the Division of Mathematical and Physical Sciences. Michael, who received a $10,000 scholarship, expects to receive a Ph.D. in mathematics in June 2000 after which he plans to teach undergraduate mathematics at the university level and continue his research in stochastic optimization.

The scholarship was made possible by a bequest in the amount of $10,000 annually made to the Department by William Karl Schwarze who received his bachelor's degree in our Department and subsequently became a high school teacher of mathematics in San Francisco. Mr. Schwarze remembered his studies in the Department with such fondness that he decided to leave funds for students in our Department who demonstrate outstanding mathematical scholarship and exceptional promise of making a strong professional contribution as a mathematics teacher and educator at the pre-college or undergraduate college level.

Prior to coming to Davis, Michael earned two B.S. degrees: one from the US Air Force Academy in mathematical sciences and a second from Texas A&M in meteorology. He received an MS degree in applied mathematics from Cal Poly State University in 1994. He graduated with distinction from Cal Poly while working full-time.

Since entering UC Davis' Graduate Program in Applied Mathematics in 1995, Michael has been a top student in the program. He has been employed as a Teaching Assistant, Associate-In, and Research Assistant. His teaching experience includes Math 21D once and 22B four times. In his application for this scholarship, Michael writes that he "loves the challenge of making a difficult subject clear and meaningful. His goal as a mathematics teacher is clear: to show each student that he or she is a mathematician." Student comments from Michael's teaching evaluations reflect his strong commitment to teaching.

News from the Undergraduate Program in Mathematics

by Jim Diederich
Vice Chair for Undergraduate Affairs

This was a very active year for the Undergraduate Program Committee (UPC) which has the responsibility for initiating changes and for monitoring our undergraduate program. Two initiatives stand out among the many that were taken.

The UPC worked on obtaining approval, starting in Fall 2000, to make all regularly scheduled upper division mathematics courses 4 unit courses. This should be a better reflection of the work load in our mathematics courses, which are very demanding, and will help students meet their schedules for graduation.

Another initiative was in response to requests from the College of Engineering to make changes in several of our courses. The UPC, through a subcommittee headed by Prof. Bruno Nachtergaele, has had extensive discussions with faculty in Engineering to better meet the needs of Engineering students in their mathematical education. The proposals made by the subcommittee will be considered in the Fall by the UPC.

We had an exceptional group of mathematics majors graduating in 1999. This was reflected in many ways including the number of department citations awarded. The four citations for excellence in mathematics were given to April Kwong, Derek Newland, Lily Pang, and Issac Trotts.

Five seniors took advantage of the opportunity to write senior theses in 1998-99, a record number. This opportunity is just one of many ways in which mathematics majors have to opportunity to work on research projects with the faculty.

Lily Pang wrote her thesis on "Mathematical Model of a Dialysis Vascular Access Graft" under the direction of Prof. Angela Cheer. Lily will start medical school at UCSF in the Fall.

Issac Trotts wrote his thesis on "Variational Design of Implicit Surfaces" under the direction of Prof. William Thurston. Issac will begin work on his Ph.D. in applied mathematics at Brown University this Fall.

Yassal Habbas wrote her thesis on "Exploring the Seifert-Weber Manifold" under the direction of Prof. Abigail Thompson. Yassal is continuing her research project this summer, combining combinatorial topology with computer graphics, before going into the Ph.D. program here in computer science.

Derek Newland wrote his thesis on "A Search for 2-complex Analogues of Kuratowski's Theorem" under the direction of Prof. Abigail Thompson. Derek presented his work at the Undergraduate Research Conference. He is entering the Ph.D. program in mathematics at UCSD.

Christina Folsom wrote her thesis on "Ribbon Graphs, Strebel Differentials, and Riemann Surfaces" under the direction of Prof. Motohico Mulase. She is now a PhD student in Mathematics at UCLA.

Nine Mathematics majors graduated with honors in June 1999. They are: Jennifer Brown, Laimai Cong-Huyen, Maria DeLeon, Christine Folsom, Yassal Habbas, Susan Kingston, April Kwong, Lily Pang, and Nichole Renda. Two students, Issac Trotts and Derek Newland, graduated with High Honors, and two students, Lily Pang and Yassal Habbas, graduated with Highest Honors.

1999 Undergraduate Degrees Conferred

BA

Buck, Will
Kingston, Susan
Virmani, Rajeev

BS

Ainsworth, Rebecca
Ashton, Jennifer
Astorino, Laura
Brown, Jennifer A.
Carpenter, Laura
Castleton, Daniel
Childs, Henry
Cong-Huyen, Laimi
Cota, Heather
Dagler, Clayton
Delaney, Thomas
Deleon, Maria
DeStefano, Christopher
Englehardt, Rhonda
Fisher, Taylor
Folsom, Christina
Gartsman, Yelana
Gomez, Juan
Habbas, Yassal

Hao, Fritzie
Hoang, Cathy Dangtran
Kingston, Susan
Kwan, Kenneth
Kwan, Kenneth
Kwong, April
Linsenmeyer, Corey
Linehan, Tara
Luo, Julia
Lui, Oi-Wing
Marozik, Philip
Mar, Lindsay
Oakley, Gratia
Newland, Derek
Pitfield, Simon
Pang, Lily
Perkins, Jennifer
Reed, Michael
Renda, Nichole
Setser, Tina
Sultana, Daniel
Tam, Stephen
Thomas, Scott
Tiret, Jason
Trotts, Issac
Virmani, Rajeev
Walters, Julia

Ben Bunting Wins the Sixth Robert Lewis Wasser Prize

The Robert Lewis Wasser Prize, in the amount of $500, was presented at the annual Departmental Awards Ceremony by Dr. Peter Rock, Dean of the Division of Mathematical and Physical Sciences. It was made from funds received from the endowment of the Robert Lewis Wasser Memorial Fund in excess of $10,000 named in memory of Robert Lewis Wasser, a junior student in our Department, tragically killed in a car accident on September 11, 1993. The prize is awarded to the winner of the Robert Lewis Wasser Memorial Contest conducted annually for freshmen and sophomore students at Davis.

This year's winner, **Ben Bunting**, is a freshman at UC Davis. He has not as yet formally declared a major, but expresses an interest in mathematics. He stated that "by studying mathematics, I am preparing for one of two possibilities. I would either like to enter into the working world with math training, or continue my studies in graduate school for the possibility of teaching."

The prize was handed to him by Mrs. Vera May Wasser, Robert Wasser's grandmother, the initiator and main contributor to the Fund. Also present at the ceremony were Robert Wasser's mother, Cheryl Booth, and his stepfather, Michael Booth, and Robert's aunt Sharon Zeches.

Erica Bae and **Richmond Tu** received honorable mentions.

Spring Mathematics Contest

The winners of this contest in the Spring of 1999 were:

First Prize: **Roger Yeh**

Second Prize: **Joseph Teran**

Third Prize: **Ronald Briggs** and **Ruiwen Jin** (a tie)

Mathematics at this Year's Picnic Day

by Jim Diederich

The puzzle table at this year's Picnic Day was very popular with the visitors to campus as demonstrated by the large number who tried their hands (some actually tied their hands in one puzzle) at solving some very interesting problems. In addition, there was a contest involving placing chips selected randomly with dollar amounts on them on the correct squares on a chessboard. It is assumed that one penny is on the first square, two pennies on the second, and double the amount on each subsequent square.

The winners in the Chessboard Doubling Contest were:

Adult Division (times - 30 seconds to place three chips):

1. **Katherine Ahern**, who begins her graduate program in Philosophy in the Fall at UC Davis after having completed her undergraduate work at UC Santa Cruz.

2. **Jessica DePrima**, who is a UCD undergraduate and is an Environmental and Resource Science major in her fourth year, and is also minoring in Spanish.

3. **Steve El-Bdour**, who graduated in 1997 from Davis with a degree in Mathematics and a minor in Philosophy. Steve is currently working as a salesman in Sacramento, selling industrial woodworking machines. This job is allowing him to combine his love of tools with a desire to learn how successful businesses function. He anticipates returning to graduate school.

4. **Dan Clayton**, who is a UC Davis undergraduate.

Under 18 Division (untimed):

1. **Jeremy Tauzer**, who is in the 10^{th} grade at Davis High School.

2. **Amy Donovan**, who is in the 6^{th} grade at Valley Oak Elementary School in Davis.

3. **Bryce Holmes**, who is in the 5^{th} grade at Cesar Chavez Elementary School in Davis.

STAFF NEWS

by Tracy Ligtenberg, MSO

The academic year 1998-99 has been an eventful one for the staff. The Department has welcomed three new staff, the first being **Marian Bilheimer**. She began in early June filling our part-time position, and her duties are primarily purchasing support and reception. **Cheryl Taylor** became our new Undergraduate Coordinator in late June, she came to us from Civil Engineering. **Diana Nearn**, who began in August, came to us from the School of Medicine, Dean's Office. She will work in the Department's Business Office.

Besides welcoming new staff, one of our current staff, **Tracey Brooks** gave birth to her son, Ryan, on August 10, 1999. As many of you know, Tracey is our Business Manager and a long-time employee of the Department.

We're very pleased with the addition of our newcomers and look forward to the new academic year ahead.

Aaron Klebanoff Receives George Polya Award

At the awards ceremony of the national meeting or the Mathematical Association of America on August 1, 1999, **Aaron Klebanoff** (1987 B.S., 1989 M.S., 1992 Ph.D.) and now Associate Professor of Mathematics at Rose-Hulman Institute of Technology, and his co-author John Rickert, received a prestigious George Polya Award for expository writing for their joint paper "Studying the Cantor Dust at the Edge of the Feigenbaum Diagrams," which appeared in the May 1998 issue of the *College Mathematics Journal*, pp.

189-198. The citation states that the authors "show how Cantor sets arise quite naturally. They do this in a way that can be immediately visualized and comprehended by first-year students."

Life After Davis

Submitted by Tom Delaney (B.S. '98)

I never paid much attention to mathematics in my junior high school years. It seemed that math class was just as monotonous as the others were. Thankfully there was a change when I started high school. My father wanted me to enroll in algebra as a freshman so I would take pre-Calculus my senior year and Calculus as a freshman in college.

My first few months of high school algebra were unbearable. Every night my father and I would sit down at the table and fight through the day's assignment. Then one night the light came when a challenging problem started to make sense. I started to explain to my father the solution to the algebraic equation, and he just about fell out of his chair. After two months of nightly tutoring our hard work had paid off.

Mathematics became special to me because it is challenging. I excelled in math through my first two years of college but was met with a new challenge when I arrived at Davis and started taking upper division math courses. Math 108 felt like that algebra class back in high school. Like algebra, abstract mathematics was something I had never experienced before. Instead of performing simple calculations we now had to supply the proofs.

I currently work as a Financial Analyst for the engineering consulting firm Berryman & Henigar in my hometown of Pleasanton, California. I discovered this firm through the Career Fair at Davis. We work with public agencies to deliver expertise in all areas of public finance. My course work at Davis prepared me well for the workforce. I use my education every day at work. Fortunately, everything I do is mathematical. The analytical skills I learned from professors like Dr. Krener, Dr. Mulase, and Dr. Alder have proved very valuable.

Submitted by Curtis Feist (Ph.D., '98)

Greetings from Wild, Wonderful (that's what our license plates say) West Virginia. Let me first of all say that I feel very fortunate to have found a tenure-track position right out of graduate school, and that I like my job very much. However, I must also say that, as a California native, I do miss the West Coast.

First, the job: It's great! I am at Marshall University in Huntington, WV. It is a very old, public, primarily teaching institution that seems to me very similar in size and spirit to a Cal State University. The students are motivated, respectful, and a lot of fun to work with. My colleagues are also great. I was one of four new hires, and we were the first "new people" in quite a while; everyone else in the department is already tenured, and most of them are already Full Professors! They're are 24 of us in all, and everyone is very supportive. One thing I'm particularly enjoying is teaching an Introduction to Higher Mathematics course (Math 108 at Davis). This is the course that convinced me to become a mathematics major when I was an undergraduate, so now I'm hoping to convert a few students myself.

Second, the region: OK, so I was sheltered in California. I thought that the weather would be what I would find the most challenging to deal with, but I don't mind it at all; just dress warm in the winter, and always carry an umbrella. Apparently we had a mild winter, with just a few days of snow on the ground. I was sort of hoping we'd really get slammed, so that I could see right away how bad it can get. Anyway, what is challenging is the socio-economic problems of West Virginia. I won't go into the details, but as I said, I do miss California.

Finally, one thing I recommend to anyone is driving across the country. My wife Kim and I have done it three times now: West to East in the summer of '98, and both directions in '99. It really is enjoyable if you don't have to rush, and it gives one a much different perspective than just flying and "magically" landing somewhere new. On the other hand, will we try to do this every summer? I don't know...

So. Thanks to all who helped me get to this point, and hello to everyone I had the pleasure of meeting. And, of course, remember that these two groups are really the same.

ALUMNI NEWS

- **Nate Burkett** (1993, BS; 1994, MA) is a senior software engineer for Micro House International in Boulder, CO.
- **Colleen (Cheney) Cheek** (1992, BS) is a mathematics teacher at Vintage High School in Napa, CA. After graduating from UCD she was an English as a Second Language teacher in the Czech Republic for three years.
- **Samson Cheung** (1989, Ph.D.) is working as a scientific consultant to NASA Ames Research Center in Mountain View, CA.
- **Joe Good** (1996, Ph.D.) is a tenure-track Assistant Professor at Skyline College in San Bruno. He has been teaching at St. Mary's College until this Spring.
- **Mark Harbison** (1990, BA) received an MA from SDSU in 1992 and taught at several high schools and community colleges since then. Currently he teaches mathematics at Hoover High School and Glendale College and is the newletter editor for the California Mathematics Council of Community Colleges--Southern California (CMC^3-S).
- **Mas Kimura** (1996, Ph.D.) is a tenure-track Assistant Professor at Hood College in Frederick, Maryland. He has been Visiting Assistant Professor at the College of William and Mary for the past three years.
- **Vinh Lam** (1995, BA) is Co-Chair and mathematics teacher at Tennyson High School in Hayward, CA. He is currently enrolled in the administrative credential program at CSU Hayward.
- **Kent Neuerburg** (1983, BS; 1985 MAT) taught mathematics in high school and community college for nine years. He earned a Ph.D. in mathematics from the University of Missouri, Columbia in 1998 and is currently on the faculty at Southeastern Louisiana University in Hammond and participating in the MAA's Project NexT.
- **Rick Vaughn** (1998, Ph.D.) is a member of the faculty of Paradise Valley Community College in Phoenix, AZ.

An Interview with Maria DeLeon

by Jim Diederich

In the Spring Quarter, 1999, Jim Diederich, Vice Chair for the Undergraduate Program, talked with Maria DeLeon about her experiences in the Education Abroad Program. Maria, who graduated in June, was the Academic Peer Advisor for the Mathematics Department in 1998-99. The Peer Advisor is an undergraduate senior who helps with the advising of mathematics majors. It is a position of considerable responsibility since the Peer Advisor is often the first person to talk to prospective mathematics majors. Here are excerpts from their conversation.

J.D. Before we start I want to ask you about your recent award for undergraduate research. I should point out that you have already been nominated for the Mary Jeanne Gilhooly Award, an award for the outstanding graduating senior woman.

M.D. I went to the state-wide CAMP research symposium in Santa Barbara last weekend and won a Distinguished Research Award for my presentation on Penrose Tilings. They handed out three awards in each division, and I got one in the physical sciences. I really learned a lot doing it. I did this work with Professor Thurston as my mentor.

J.D. Great! Let me turn to your education abroad. As I recall, you went to Sweden in the first quarter of your junior year, that would have been Fall 97. Did you go on your own or through the Education Abroad Program?

M.D. Yes, it was Fall 97, and I applied in my sophomore year through EAP. I had always wanted to study abroad, probably since junior high school days.

J.D. I am aware of only two other math majors who have studied abroad, in fact it was twin sisters who went to Australia. Do you think cost is a barrier to going abroad?

M.D. Overall it wasn't that much more expensive than it would have been if I had lived here. EAP has some scholarships which can help too. The tuition was the same, and it was for a semester rather than a quarter, and I lived in student housing. The airfare was high, but I got a small discount as a student.

J.D. What influenced your decision to go to Sweden?

M.D. I wanted to finish my math major in 4 years, so I could only go for a semester. That and the math courses available eliminated many countries. I also wanted to go to Europe. My mother's side of the family is from Sweden and some of my relatives from Sweden have visited us here. So I was able to visit with family over there.

J.D. So when you went, you had already taken Math 108, the first upper division math course math majors take, and you went at the beginning of your junior year. In retrospect does that seem like a good time to go or do you think the end of the junior year would have been a better time?

M.D. Most students go in their junior year. It would have been nice to go at the end of my junior year, but they were on semesters, and it is hard to find classes to take just for the Spring quarter. The traditional route is to go for just the Fall quarter or to go for the whole junior year.

J.D. Were there any other students from UC?

M.D. There were about 20 students from UC who went to Sweden. We had some Swedish classes together and got together socially. We also took some trips together, some before school started and some after, such as at Thanksgiving, which the Swedes don't celebrate. The students who stayed for the year got to campus a month or two before school started to get a better grip on the language. Those who were just staying for a semester arrived somewhat later.

J.D. What city in Sweden was the University located in?

M.D. We were in Lund, which is south of Stockholm, near the southern coast.

J.D. Now the question everyone wants to know the answer to is, did you take any math classes while you were there?

M.D. The students there tend to specialize very early and focus quickly on one subject. So they quickly get into upper division work. There aren't a lot of lower division courses. The first math class I tried was too difficult. It was in English, with an English text. But I didn't have enough of the prerequisites. I had a list of courses that Prof. Fannjiang and I had worked out that I wanted to take, but I had to go around to some of the instructors to find one I could handle. I met a Prof. named Gundren. She was very nice, and she switched her lectures to English, which all of the Swedish students are supposed to know. And she helped me with the text, which was in Swedish. It was a course in non-linear dynamical systems. That class met once a week for two hours. It did some numerical techniques I saw later in Math 128C. They seemed to do a lot more computer work than I had encountered here, so I had to learn Maple. I also worked on a project with another student and got a crash course from him in Matlab.

J.D. We are getting our students more and more into Matlab too. So you got to know some of the other students in the class?

M.D. Some of the Swedish students were very friendly and were eager to get to know the international students, and some more or less stayed in their own groups. So I got to know some of them very well even though I felt a little shy. Also I went to a college bible group and met one of the guys in the class who was really a very good student. There weren't too many girls in the class, so I made an effort to meet them.

J.D. Did you see any similarities or differences between the Swedish students and Davis students?

M.D. Since it was a student culture, there were a lot of similarities. But there were also some differences. When you go to the university in Sweden, after passing an entrance test, it is usually after taking a year off just after high school and going to another country as an au-pair or doing something like sheep farming. When they get to the university they usually have a vocation in mind and go to the university to get training in something. Their tuition is covered, and they can't accrue the kind of debt that students here can in terms of the loans they get. They are generally very well off. They have private dorm rooms, with private bathroom, that are very large and filled with all kinds of stereos and the like. When I moved into my room, I could barely make it look lived in I had so little in my suitcases. They generally don't work while they are in school. Some stay in school as long as they can. . They seem to like their country a lot and feel very good about it.

Emeriti Update

by Sherman Stein, Professor Emeritus

Henry Alder continued to chair the NSF-supported campus project, Minority Undergraduate Research Participation in the Mathematical and Physical Sciences. He also served on the committee preparing the statewide tests designed to measure student achievement in mathematics with respect to the newly adopted State Mathematics Standards and was also appointed to a panel to recommend to the State Board of Education textbooks for grades K-8 that are consistent with these Standards. He continued to chair

MAA committees, including the one selecting the recipients of the national Distinguished Teaching Awards, and is a member of the MAA Task Force advising the NCTM on the revision of its Standards. He also moderated a panel discussion on "The evaluation of state standards for school mathematics" at the national MAA meeting. At the department level, he chaired the Committee on the Mathematical Preparation of Teachers, which is reviewing all aspects of both the pre-service and in-service mathematical preparation of elementary and secondary teachers.

Don Benson's book, *Moment of Proof*, was published by Oxford University Press in March 1999. It seeks to make elegant mathematical proofs accessible to the general reader. It is a Science News selection (Books Now) and an alternate Science Book Club selection.

Don Chakerian has given lectures at the Asilomar teachers conference and at various schools in the Northern California area, most recently at the Sonoma State University Math Festival in April. He has been actively involved in Kurt Kreith's inservice educational projects, such as *Starting with Math*, and collaborated with Kurt Kreith on the book *Iterative Algebra and Dynamic Modeling*, which was published by Springer-Verlag in June 1999. He has also been a member of the departmental Committee on the Mathematical Preparation of Teachers chaired by Henry Alder.

Kurt Kreith continued to serve as graduate adviser for MAT students and taught both 210B and a Freshman Seminar on a pro bono basis. He also served on a Content Review Panel appointed by the California Board of Education and on the Elementary Subject Matter Advisory Task Force appointed by the Commission on Teacher Credentialing.

Together with Professor Sallee and several faculty in the Division of Education, he was awarded a grant by the Commission on Teacher Credentialing to develop a Blended Program of Teacher Preparation at UCD.

In the summer of 1999 Professor Kreith offered a 3-week Summer Workshop for Master Teachers of Mathematics at Columbia University Teachers College. This workshop was based on the book *Iterative Algebra and Dynamic Modeling* he wrote with Professor Chakerian and which was published by Springer-Verlag in June 1999.

Sherman Stein's book *Strength in Numbers*, published by Wiley, appeared in paperback in March 1999. It has now been translated into Japanese and Polish. In June the MAA brought out his book *Archimedes: What did he do besides cry eureka?*, aimed at the busy mathematical public, from high school student to professional mathematician (anyone who recognizes the equation of a parabola). In July, 1999 he spent a week at the Seattle MathCamp for very promising high school students, lecturing on affine mappings, valuations, and tilings by triangles of equal areas. He also continued to serve as reviewer and referee.

Takayuki Tamura continued his study of semigroups, in particular *S*-indecomposable semigroups and subdirect products of the group of integers under addition. Some of his results will be presented as a paper in the Second Symposium on Algebra, Languages, and Computations held at Osaka University in August, 1999. In addition to serving as referee and reviewer, he has continued as a regular monitor of Radio Japan. His poems in the traditional Tanka style have often won prizes. In addition he contributes free-style poems in English to the Courier at Covell Gardens, where he resides.

New Initiatives for Teacher Preparation

Early in the 1998-99 academic year, a Committee on the Mathematical Preparation of Teachers was appointed, with Henry Alder as chair, to review and make recommendations for the preparation of mathematics teachers at both the elementary and secondary levels. This committee was appointed as a result of recent legislation to address the severe shortage of mathematics teachers and assist the state-wide efforts to prepare teachers able to implement the recently approved "Mathematics Content Standards for California Public Schools-Kindergarten through grade Twelve."

The Committee met regularly during the past academic year and recommended two new major initiatives by the department:

(a) A two part course "Elements of Mathematics for Elementary and Middle School Teachers" to be given during the summer starting in 2000 and to be offered by University Extension. This content-based course will cover the standards for grades four to seven. Additional information on this new course is contained in a separate article by Don Chakerian, chair of the subcommittee that developed it.

(b) A new program for mathematics majors intending to become secondary teachers covering the current requirements for both the major and the credential in just 4 years, but with the addition of a few courses emphasizing the implication of existing courses for the teaching of high school mathematics courses. Some details on this new program-called a blended program-are contained in a separate article by Kurt Kreith, chair of the subcommittee that developed this program.

Inservice Courses Emphasizing Mathematical Content

by Don Chakerian

The California Mathematics Academic Content Standards, recently adopted by the California State Board of Education, are intended to strengthen the mathematical content of the K-12 curriculum in California schools. In order to encourage teachers to become knowledgeable about these Standards and assure that they bring to their classrooms the depth of mathematical understanding required to teach the recommended content, the legislature has passed Assembly Bill 2442 (the Mazzoni bill), establishing a grant program enabling teachers in grades 4-12 to take mathematics courses at accredited institutions. The need created by such measures has motivated several campuses of the University of California and the California State University to prepare courses suitable for working teachers desiring to upgrade their mathematical expertise. Along these lines, the departmental Committee on the Mathematical Preparation of Teachers has recommended that our department offer a pair of courses, titled Elements of Mathematics for Elementary and Middle School Teachers, Parts A and B, suitable for in-service teachers in grades 4-7, to be administered through University Extension, although the content and choice of instructors would be under the governance of the department.

Pending final approval, these courses will be available beginning the summer of 2000. These will be 3-week courses, meeting a total of 40 hours each, with Part A emphasizing the content recommendations in the Standards that deal with "number sense," while Part B emphasizes the recommendations concerning geometry, probability, and statistics.

The structure and proposed administration of the courses was developed by a subcommittee consisting of Rick West, Learning Skills Center, Margaret Wilcox, Director of Education and Clinical Practice at University Extension, with Don Chakerian, Professor Emeritus, as chair. Those interested in obtaining more details can obtain them from Don Chakerian.

Mathematics Department to be Home to Novel Program of Teacher Training

by Kurt Kreith

Beginning in Fall, 2000, the Department of Mathematics is likely to be home to an innovative new program for preparing secondary school teachers of mathematics.

Having received a grant from California's Commission on Teacher Credentialing, mathematics professors Kurt Kreith and Tom Sallee are working with Education faculty Sharon Dugdale and Robert Van Dyne to establish a "blended" program of teacher preparation. Rather than deferring their work for a teaching credential until after they complete a bachelor's degree, students interested in careers in teaching would be able to begin their professional preparation as early as the freshman year. In addition to enrolling in required mathematics courses, these future teachers would take courses that link their study of mathematics to the secondary school curriculum. They would also participate in internships that place them in teaching roles under the guidance of a mentor teacher. Such preparatory work will enable them to complete both a bachelor's degree and a single subject credential in 4 years. Students qualified for enrollment in the Master of Arts in Teaching degree program will be able to receive the MAT and a single subject credential in 5 years.

Pending approval by the College of Letters and Science, the Academic Senate, and the Graduate Division, this program will be available to students in Fall, 2000. We are also working with area community colleges to make this program accessible to transfer students.

Obituary, Joel E. Keizer
A Long Time Friend of the Department

by Motohico Mulase, Chair

The Davis campus suffered the grievous loss of a great scientific mind this spring. Professor Joel Edward Keizer, the founding Director of the Institute of Theoretical Dynamics (ITD), a prominent biological scientist, and a strong supporter of mathematical research, died of lung cancer at his home on May 16, 1999, at the age of 56. A celebration of his life was held in early June at a friend's home.

Although Professor Keizer was never affiliated with the Department of Mathematics, his presence was strongly felt by the entire research community of the Department, from faculty to students. He was the Director of the ITD since its establishment by the UC Regents in 1985. The institute functions as a research arm of the Graduate Group in Applied Mathematics, which is housed in the Department. Professor Keizer provided the mathematics research community with office space, an active and stimulating research environment, seminar funding, computational resources, and above all, warm friendship and kind advice. The ITD has brought many distinguished visitors to the campus and hosted several conferences in applied mathematics. Professor Keizer has promoted interdisciplinary research that ranges from applied mathematics to chemistry to physics, to biology, and to medicine. He was a strong advocate of mathematical research and has supported research activities of the Department faculty.

A symposium, *Nonlinear Dynamics in Biology and Chemistry*, was held on the campus in early September to honor Professor Keizer. Angela Cheer, Professor of Mathematics and Acting Director of the ITD, served as Chair of the Organizing Committee.

For more information on Professor Keizer's life, the Keizer Memorial Fund, and the ITD, please visit the web site at: **http://www.itd.ucdavis.edu/.**

The Department of Mathematics Newsletter Editorial

by Henry L. Alder, Editor in Chief

As must be evident from the articles in this Newsletter, the past academic year has been a most productive one for the department of mathematics in fulfilling its mission to excel in teaching, research, and public service, the traditional responsibilities of a major university. As detailed in these articles, the department's faculty and students received many honors and awards, and several records were broken.

The new academic year just starting saw no changes in the administration of the department. The chair and vice-chairs, as well as the department manager, all remain the same as last year.

We are always pleased to receive information from you on the activities you are engaged in and have included it in the Alumni News column of this Newsletter. Please continue to keep us up-to-date on your career if there have been any changes by filling out the Alumni News Update Form on the inside back cover. Also send us any other information you feel would be of interest to other alumni and would, therefore, be suitable for inclusion in the next issue of this Newsletter. We like all alumni to share in the pride of each success story such as the one of Tom Delaney and Curtis Feist in this issue of the Newsletter.

The Department of Mathematics Newsletter

As always, we would like to hear from former Davis mathematics students about what they are presently doing and how they are applying their mathematical skills.

Alumni News Update Form

Please update information about yourself
by using our electronic update form.

http://math.ucdavis.edu/newsletter/alumniform.html

More information about the department is available on the Department's Home Page at:

http://www.math.ucdavis.edu
