DEPARTMENT OF MATHEMATICS NEWSLETTER

University of California, Davis

FALL 1998

INDEX

A MESSAGE FROM THE CHAIR

Motohico Mulase

I am pleased (and surprised) to be writing this article for the 1998 Fall Newsletter as the Department's Chair. I am honored to have been selected for this position. I follow many fine individuals' footsteps. I foresee the coming year will be a busy one. The Department is recruiting for four new faculty. We have started the recruitment process much earlier with the goal of being successful in the areas specified for hiring. Additionally, the Department is conducting a review of the graduate programs in Mathematics

including the M.A.T., which is coordinated through Graduate Studies. The last review took place in 1987 so the coming one will be very comprehensive in scope. The other important task facing the Department this year is academic planning for the 21st century. Our charge is to develop a detailed plan for growth for the next eight years to meet the needs of our students as enrollments expand. For me this is an exciting time to be working in the Department, and I will inform you regarding the outcome as the events unfold.

W. K. Schwarze Scholarship
Awarded to David Brown

At the annual Departmental Awards Ceremony on June 10, 1998, the Department awarded the William Karl Schwarze Scholarship in Mathematics to David H. Brown. The presentation was made by Dr. Peter Rock, Dean of the Division of Mathematical and Physical Sciences. David, who received a $10,000 scholarship, expects to receive a Ph.D. in mathematics in June 2000, after which he will pursue a career in academia so that he can combine his loves of scholarship and teaching. 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.

David began his mathematical career by obtaining a B.A. in classics from St. John's College in 1992. He then decided to take the next obvious step and learn some mathematics. This he did first for two years at the University of New Mexico, where he also taught precalculus for one of those years.

He came to UC Davis in 1995 where he was appointed as a teaching assistant in the Department of Mathematics. His instructors in the graduate classes which he has taken describe him as anywhere from one of the best students to the very best student in their classes. He is now a student of Professor Alan Hastings, and a member of the NSF Research Training Grant in Nonlinear Dynamics in Biology. For his research, David constructs population models to try to understand the role of infectious diseases in natural ecosystems.

In addition to being a solid scholar, David is also a very mature and responsible student who has strong leadership skills. He, together with another student, organized the Graduate Group in Applied Mathematics student seminar this past academic year which ran very smoothly.

He has taught three different classes so far in the department of mathematics, namely Math 16A, 21C, and 22A. The faculty member who supervised his first quarter of teaching in the first of these classes reports that he found David to be a teacher of superior capability. His student evaluations are of the highest caliber of which the following two are typical: "One of the best math teachers I've had. Put a lot of his time into the course; obvious that he cared about students learning" or "Awesome teacher! Hope he pursues teaching in the years to come at UCD."

Spring Mathematics Contest

The winners of this contest in the Spring of 1998 were:

First Prize - Richard Peterson
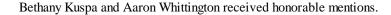Second Prize - Tom Craven
Third Prize - Simon Pitfield

John Yu-Chia Lin Wins the Fifth

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, John Yu-Chia Lin, is a freshman at UC Davis, where he is majoring in physics, but is thinking of changing to computer science. Prior to entering Davis in 1997, he went for his junior and senior years of high school to the Phillips Exeter Academy in New Hampshire and for the first two years to Robert Lewis Stevenson High School in Pebble Beach, California. He always has greatly enjoyed doing mathematics.

In his free time, John is engaged in triathelon activities and computer programming.

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.

Bethany Kuspa and Aaron Whittington received honorable mentions.

Alice Leung Scholarship in Mathematics Awarded to Maike H. Meyer

At the annual Departmental Awards Ceremony, the Department awarded the first Alice Leung Scholarship in Mathematics to Maike H. Meyer. The presentation was made by Dr. Peter Rock, Dean of the Division of Mathematical and Physical Sciences. Maike who received a $1,000 scholarship will use it to complete her study for the Ph.D. which she expects to receive in June 1999. The scholarship was made possible by a bequest in the amount of $50,000 to the Department of Mathematics by Alice Siu-Fun Leung who received an M.A. degree in mathematics from UC Davis. According to her sister Kathleen Griffin, she always spoke highly of her experience at UC Davis. She made the bequest to express in concrete terms her high regard for the Department of Mathematics at UCD. The earnings from the endowment are to be used for awards to be presented annually to "one or more qualified students in Mathematics who have shown exceptional promise in all aspects of mathematics including research, scholarship, and teaching."

Maike received a degree in Germany equivalent to a Master's in mathematics. She entered the Ph.D. program in Davis in the fall of 1995. She decided to apply for the program because she had the chance to visit the department for one year while working on her Master's thesis for her German degree and liked it very much.

Her instructors in her graduate courses praise her performance in the most glowing terms. Thus, one of them characterizes her as a very enthusiastic learner. She understands deeply complicated things related to brand new invariants of contact manifolds and knots. This professor attended at least three of Maike's talks and seminars and states "that never before had I listened to a student's talk of this clarity." Another instructor has "been greatly impressed by Maike Meyer's intellectual curiosity and scholarly following through, which she communicates with infectious enthusiasm."

She is working for a Ph.D. under the direction of Professor Dmitry Fuchs. Her area of research is Legendrian knots and contact structure which links two fascinating and very active research areas of mathematics and mathematical physics: Contact Geometry and Knot Theory.

As a teaching assistant in the department of mathematics since the fall of 1996, she has taught for four quarters, each class with spectacular success. Her student evaluations are consistently incredibly high and include comments such as these two typical ones: "This has been a great class. Maike is one of the best" or "This was one of the greatest instructors I have had. It seemed easy when she was teaching. The survey needs higher marks for her excellent job."

The 1998 Prize for the Outstanding Teacher of Lower Division Mathematics

The 1998 Prize for the Outstanding Teacher of Lower Division Mathematics was awarded at the annual Departmental Awards Ceremony on June 10, 1998, by Peter Dale, Vice Provost for Undergraduate Studies. The recipient was **Dr. Lawrence Marx**. The following citation was presented to Dr. Marx:

"This year's winner of the Outstanding Teacher of Lower Division Mathematics is most worthy of this distinction. Even when teaching Math 16 classes to large sections, students respond positively and enthusiastically to the teaching style and personality. Smaller classes respond even more warmly. As you might expect, the comments from the students are the kind we all wish we had: "Very knowledgeable and willing to help students. Gets an A++." "Dr. Marx is the best math teacher I've had. The complicated material was presented in an understandable fashion. The many office hours were extremely helpful." "This is an excellent course with an excellent teacher. I only wish I took full advantage of it and did not slack off." "Flat out, [this instructor's] enthusiasm to teach the subject of calculus at 8 a.m. is remarkable." Finally, most succinctly: "Dr. Marx should be awarded the Nobel Prize in math."

"In addition, students remark repeatedly about the teaching style, commitment to their learning, enthusiasm and the overall support which is continually given by Dr. Marx. This is not the first time that he has won the award nor will it probably be the last since he always seems to be a finalist whenever he is eligible. Thus, the Department of Mathematics takes great pleasure in presenting the 1998 Award for Outstanding Teacher of Lower Division Mathematics to Dr. Lawrence Marx."

Highest Campus Honors Earned by Mathematics Students

At this year's graduation ceremony, two mathematics students captured two of the most prestigious awards of the Davis campus: the 1998 University Medal, the highest campus honor awarded to a graduating senior in recognition of superior scholarship achievement, was awarded to **R'lyeh Raphael Schanning**, with a minor in mathematics and a major in history. The 1998 College of Letters and Science Leon H. Mayhew Award for academic excellence was awarded to **Seth Adam Stevelman**, with a major in both mathematics and political science.

Both students were recognized at the annual Departmental Awards Ceremony with special letters of congratulations from Professor Craig A. Tracy, Chair of the Department of Mathematics.

1998 Undergraduate Degrees Conferred

BA
Auer, Kristian M.
Barkhurst, Molly M.
Boles, Keilani R.
Gomez, Martin
Johnson, Andrew W.
Lim, Alicia R
Manzitto, Tiffany M.
Wilday, Erin S.

BS
Barboza, Erika A.
Bent, Leeann
Caballero, Paul

Cecil, Jesse J.
Chan, Chi Wai
Choi, Kathleen C.
Compton, Craig R.
Davis, Lisa A.
Fawal, Najla G.
Ferrante, Eric M.
Frand, Kevin T.
Grishin, Denis
Guan, Bao J.
Harvey, Kathryn D.
Kang, Sung Jin
Lee, Rebecca M.
Leong, Wing Yin
Mills, Elizabeth A.
Orr, Sharla J.
Saechao, Chengchio
Simmons, Dennis G.
Smith, Natalie D.
Stiefel, Kathy M.
Ten Broeck, Anthony d.
Vaiuso, Richard G.
Ward, Amanda I.
Wong, Tiffany C.N.
Wu, Frances Y.
Zhu, Myra W.Y.

New Faculty
by Bruno Nachtergaele

We would like to welcome two energetic young mathematicians who are joining our department this fall: Jesus de Loera and Thomas Strohmer.

Jesus de Loera was born and raised in Mexico City. He describes himself as a true Chilango ("Chilango", is what the locals call the packs of Mexicans that flee the City for a weekend at the beach, comparing them to a small fish that lives in large schools in Mexico's coastal waters). Jesus received his undergraduate degree in mathematics from UNAM (Universidad Nacional Autonoma de Mexico), and attended graduate school at Cornell University where he received his PhD in Applied Mathematics in 1995. He then took a postdoc position at the University of Minnesota, jointly in the mathematics department and the geometry center (1995-1998).

For the academic year 1998-99 Jesus will be on leave from our department. He will be visiting the Institut für Theoretische Informatik, ETH Zurich, to run a research project on "Optimization in the space of subdivisions of a polytope," for which he was awarded a grant, together with co-PI Juergen Richter-Gebert, from the Swiss Federal research fund. Jesus is very excited about this new line of research with applications in areas as diverse as computer graphics and algorithms for finding fixed points or solving systems of polynomial equations. In mathematical terms the problem is to determine 1) the minimum number of vertices one has to add to the polytope (0 in the case of a convex one) in order for there to be a tetrahedrization, 2) to find a tetrahedrization with the minimal number of tetrahedra (e.g., 23 for the regular dodecahedron, 5 for the regular cube).

Jesus' general interests revolve around the interaction of discrete mathematics and algebraic computation. He is looking to use combinatorial techniques to give an algorithmic approach to classical problems. Existence theorems should not be the last word. For practical purposes is often important to know a way of finding an explicit solution. Taking his interest to connect computation and classical algebra one step further, Jesus produced a videotape illustrating the story of how a famous conjecture in algebraic geometry (Ragsdale conjecture) was solved.

Jesus likes to use computers in his teaching as well. Following the style of his teachers in Mexico, he wants his rapport with students to be very personable with a lot of one-to-one interaction with students. "The task of a teacher goes beyond mere instruction," Jesus says, "A teacher should also be a mentor for the class. You are there to teach an attitude towards mathematics." Jesus also believes

strongly that the professor should challenge the students and encourage them to develop a critical attitude.

Jesus de Loera is married to Ingrid Brust-Mascher, a biophysicist who, starting fall of 1999, will take a postdoctoral position in the section of Molecular and Cell Biology of the Division of Biological Sciences. Her main interest is the cytoskeleton. She will work in the laboratory of Dr. Jonathan Scholey. Ingrid and Jesus have two sons: Antonio (3 years) and Andres (6 months). They are on a day care waiting list for their return from Switzerland next fall. The family looks forward to enjoying the many opportunities for learning Davis has to offer their kids and to exploring the California outdoors on family hiking trips.

Thomas Strohmer was born in a small town near Vienna. He obtained his Masters and PhD degrees in Mathematics from the University of Vienna (Ph.D. in 1994). As a postdoc (1994-1997) he helped build the numerical harmonic analysis group in the Mathematics Department at the University of Vienna. With the financial support of a research grant from the Austrian Science Foundation he then spent a year at Stanford University to work with Professor David Donoho on a project in mathematical signal processing.

Thomas has worked on many topics in mathematical signal processing and numerical analysis. One set of problems concerns signal and image reconstruction: from a given set of data points, which may be subject to noise and are more often than not scattered irregularly in the variable domain, the object is to reconstruct the signal function. Examples include geophysical data, NMR images in medical applications, or a less than perfect audio signal. Thomas has been involved in concrete applications of all of the above. His work on geophysical imaging was in cooperation with a petroleum company, and his work with audio signals is currently being developed for possible commercial telecommunications applications.

He has also worked on a movie restoration project with the aim to use mathematical signal processing to restore the images from partly deteriorated old film and store them in digital form. The technique can also be used to remove subtitles if good copies of the film without subtitles are no longer available.

Thomas is looking forward to start teaching the numerical analysis sequence this fall. He hopes to show students that mathematics can be useful and beautiful at the same time. By using Matlab, which is widely used in industry, as the programming tool for the course, he will be able to include interesting real life applications in the course. "It is more fun to work with real life (larger) data sets and see something interesting come out of it."

Thomas lives in Davis with his partner Gabriela, and daughter Barbara who is attending high school. They find the city of Davis just the right size for their preferred style of living. The family is still adjusting to the hot climate, but when things cool down a bit, Thomas says, he would love to pick up his favorite sports, tennis and soccer.

Update on our recently "Retired" Professors
by Sherman Stein, Professor Emeritus

Professors Alder and Kreith have been recalled to teach during the 98-99 academic year.

Henry Alder continued to chair the NSF-sponsored campus project, *Minority Undergraduate Research Participation in the Mathematical and Physical Sciences* (MURPPS). He was recently appointed to the committee preparing the statewide tests designed to measure student achievement in mathematics. He continued to chair MAA committees, including the one on the national Distinguished Teaching Awards, and is a member of the MAA committee advising the NCTM on the revision of its Standards. He also was a speaker at the Asilomar meeting of the California Mathematics Council and moderator of a panel on the NCTM Standards at the national MAA meeting.

Don Benson has completed his book, *Moment of Proof*, which will be published by Oxford University Press early in 1999. The goal of the book is to communicate the joy of mathematical discovery to the general reader by attractive proofs, along with historical and descriptive commentaries.

Don Chakerian spoke at the mathematics departments of Hayward and Sacramento State Universities. He also participated in the Asilomar Conference, lecturing on False Position and Pascal's Theorem.

Kurt Kreith served as graduate adviser for MAT students and taught Math 210C in winter quarter. In support of the MAT program he

spoke at UC Berkeley and Chico State University. He also gave a two-week workshop for New York City teachers on the mathematics of global change. He is working with G. D. Chakerian on a teacher-oriented book, *Iterative Algebra and Dynamic Modeling*, to be published by Springer Verlag in 1999.

Sherman Stein published a paper with David Mead in the Rocky Mountain Journal of Mathematics on the field generated by two or three Newton polynomials in two variables. He gave the annual public mathematics address at Humboldt State University as well as talks on mathematics at Asilomar, Humboldt, and Explorit (the Davis science center). His talk, "It Takes a Village to Teach a Child Mathematics," was the keynote for a full day meeting of all employees of the Creswell, Oregon school district, where he also gave two workshops. He also completed the first draft of a book tentatively entitled, "Archimedes: What did he do besides cry Eureka?," which will be published by the MAA. John Wiley and Sons informed him that they will bring out a paperback of his 1996 book, *Strength in Numbers*, in 1999.

Takayuki Tamura continued his research in semigroups, examining the structure of the semigroup of subdirect products of the group of integers under addition. He also served as reviewer for the Mathematical Reviews and Zentralblatt. Practicing his avocation of writing Japanese poems in various traditional styles, he is a member of poetry groups in California and Japan dedicated to poetry in the Tanka form.

Awards to Davis Emeriti at National MAA Meeting

At the national Annual Meeting of the MAA in January 1998, two UCD Mathematics Professors Emeriti were awarded prizes:

Professor **Henry Alder** received a Certificate of Meritorious Service for having "been a tireless supporter of the work of the [Northern California] Section" and "providing wise counsel in every aspect of the Section's activities."

Professors **Sherman Stein** and **Sandor Szabo** received the Beckenbach Book Prize, awarded for distinguished, innovative books published by the Association, for their book "Algebra and Tiling," published as Carus Mathematical Monograph Number 25, by the MAA in 1994. As indicated in the citation, "this is a masterful and lucid exposition of a significant subject. The authors have done a great service to the mathematical community by pulling these concepts together."

Four Research Assistant Professors Join Department
by Arthur Krener

The Visiting Research Assistant Professorship (VRAP) Program is designed to give outstanding new Ph.D's the opportunity for up to three years to work with regular faculty members on areas of joint mathematical interest while gaining valuable experience teaching at the university level. Past VRAP's have gone on to regular faculty positions at universities and colleges throughout the country. Again this year there was a large pool of strong candidates and four VRAP's have been awarded.

Dr. Ian Agol received his bachelor's degree from Cal Tech in 1992 and his doctorate from UC, San Diego in 1998 both in Mathematics. His thesis advisor was Professor Michael Freedman, winner of the Field's Medal. Algol's research interests are in the areas of knot theory and three-dimensional manifolds. While at Davis, it is expected that he will interact with our strong group of faculty in this area, including Professors Hass, Kuperberg, Thompson, and Thurston, also a Fields Medalist.

Dr. Pierluigi Contucci received the Doctor Philosophae in Mathematics from the Graduate School of the International School for Advanced Studies in Trieste. His research interests are statistical mechanics, analytic number theory, constructive quantum field theory and combinatorics. He will be interacting with Professor Bruno Nachtergaele while at Davis.

Dr. Jeffrey Groah is a graduate of UCD, having received the Ph.D. in 1995 under Professor Blake Temple of our department. His research interests lie in the areas of partial differential equations, in particular, conservation laws and their application to the Einstein equations of general relativity. For the last few years he has been teaching at La Sierra University but is eager to return to Davis to continue his study of wormholes and black holes in space-time in collaboration with Professor Temple.

Dr. Chie Bing Wang received the Ph.D. degree in Mathematics from the University of Pittsburgh. His research interests are in the exact solution of classical differential equations such as the Boussinesque and Panleve equations. He will be collaborating with Professor Craig Tracy who is an expert in these areas.

Visitors at the UCD
Mathematics Department

The Department had a number of visitors during the past academic year and will have additional ones during the 1998-99 academic year. They include:

Dr. Oscar Bolina, who received his Ph.D. in physics in 1997, from the Universidade de Sao Paulo, as a student of Professor J. Fernando Perez, will spend the 1998-99 academic year at UCD on a postdoctoral fellowship from the Sao Paulo state government agency Fundacao de Amparo a Pesquisa do Estado de Sao Paulo working with Professor Bruno Nachtergaele on mathematical problems in statistical mechanics.

Dr. David Brown from the Scientific Computing group at Los Alamos spent January-June 1998 at UCD working with Professor Angela Cheer. He also gave a course on Numerics and Overtures.

Professor **Hiroshi Goda** from Kobe University, Japan, will spend the 1998-99 academic year at UCD hosted by Professor Abigail Thompson. He is a knot theorist and 3-manifold topologist and will speak about his research in the Topology Seminar this fall and working on several projects with members of the topology/geometry group during the year.

Dr. Anita Mayo from the IBM T. J. Watson Research Center spent July 1998 at UCD hosted by Professor Angela Cheer and gave a two week workshop on Computational Finance.

News from the Undergraduate Program in Mathematics
by Abigail Thompson

1997-98 was a great year for the undergraduate program, with a lively and active mathematics club and many innovations within the department.

For the non-majors in the Math 16 series we opened The Calculus Room. This is a room staffed by graduate students full-time during the week, where Math 16 students can drop in any time for help. We started out in a temporary building in the wilds of the campus near the pig barns, but were fortunate enough to be given space on the second floor of Kerr Hall in mid-year. This has been very popular with the (thousands) of calculus students taking Math 16.

We also started the UCD Math Majors Newsletter, sent out (almost) monthly by e-mail. This keeps our students up-to-date on scholarships, job opportunities, and other information, as well as giving us a great way to remind them to see their advisors.

Several of our students went to National Science Foundation summer research programs this year, including programs at the University of Washington and George Washington University. Others did exciting summer internships with companies such as Sun and IBM, while our graduating seniors went on to a stellar array of jobs in industry and teaching, teaching credential programs, and graduate programs. Department citations for outstanding academic achievement this year went to Seth Stevelman and Dennis Simmons. They are going on to careers in law and teaching, respectively.

The Math/Stat Career Fair was a very successful event, drawing representatives from IBM, Sun Microsystems, Fair Isaac, Applied Decision Analysis, and Andersen Consulting among others, and attracting over one hundred students.

The Department's Picnic Day Display is growing; we had swarms of people doing problems and puzzles, and getting a glimpse of the research accomplishments of the faculty. The members of the Math Club/Pi Mu Epsilon helped greatly on this and several other occasions. The Math Club's culminating event this year was a rafting trip down the North Fork of the American River, and we are glad (though slightly surprised) to report that just as many members returned from the trip as left on the trip (we counted).

And finally, our graduating majors (and minors!) came away with a particularly large haul of University prizes, including the 1998 Leon H. Mayhew Award and the 1998 University Medal.

News from the Graduate Program in Mathematics
by Allan L. Edelson
Vice Chair for Graduate Affairs

The graduate program is pleased to announce the arrival of new graduate students. Entering in the Pure Mathematics program are Richard Augustine, Lorraine Farrell, Najla Fawal, Christopher Jerdonek, Bao Guan, Richard Peterson, Brian Shay, Noel Smith, and Shannon Starr. In Applied Mathematics new arrivals are Scott Beaver, Denis Grishin, Wenlong Jin, and Robert Walston. New MAT students this year are Molly Barkhurst, Michelle Chiang, Deborah Desrochers, Chris Garrett, Melinda Hager, Andrew Johnson, Ivan Miller, and Victor Scafuro.

Since the fall of 1997, when the most recent edition of the Department newsletter hit the press, 15 graduate students received advanced degrees The M.A. in Mathematics was awarded to Bradley Ballinger, Robert Crawford, Lan Hong, and Earl Wong. In Applied Mathematics M.S. degrees were awarded to John Dell'Area, Sharon Lundy, Matthew Nelsen, and Audrey Robinson, and. The M.A.T. degree was awarded to Yves Bouyssounouse, Vicki Lynn Day, Monica Hirning, Amy Kronberg, and Dean Pietromonaco. Of these five, four are teaching and Yves is going on to pursue a Ph.D. in education.

Thomas Rutaganira was the recipient of the Ph.D. in Applied Mathematics for his dissertation: "Numerical Simulation of Blood Flow in Arteries: Effect of Elastic Walls." He is currently a postdoctoral fellow in the Center for Applied Scientific Computing at the Lawrence Livermore Laboratories.

The Ph.D. in Mathematics was awarded to **Oleg Zaboronsky**. The title of his dissertation was "Localization and Supergeometry." He spent one year as a member of the School of Mathematics in The Institute for Advanced Study at Princeton.

During the past year, the department has maintained its active role in support of mathematics education in grades K-12. Interest in the Master of Arts in Teaching (MAT) degree program is at an all time high, with 8 graduate students qualifying for admission in Fall, 1998. Three of these new graduate students are credentialed teachers, while five will be pursuing teaching credentials in conjunction with the M.A.T. degree.

Working through University Extension, Professors Chakerian, Kreith, and Thompson have launched a content-based inservice program called "Starting With Math." During the past year they offered pilot professional development programs to primary school teachers in Folsom and Rio Linda and to high school teachers in Tulare. On the basis of these volunteer activities, the Sacramento School District has contracted with University Extension for two days of "Starting With Math" for 500 teachers at grades 4-6. The Sacramento program will involve five of our graduate students as well as two mathematics faculty.

Galois Group's Annual Award for Outstanding Service to the Graduate Program
by Tyler J. Evans

In what has become an annual event, the Mathematics graduate students once again set about the difficult task of selecting one faculty or staff member whose personal commitment to the Graduate Program deserves special recognition. Each year, one such person is presented with a token of our appreciation. Past recipients include our Graduate Coordinator Kathy LaGiusa (1995-6) and Professor Angela Cheer (1996-7). This year, two weeks of nominations and voting by the Galois Group members could not narrow the field down to a single recipient - and so we chose to give two awards!

In addition to his outstanding teaching, Professor **John Hunter** devoted countless hours of his time to the duties of Vice Chair of the Department for Graduate Affairs. Many of the graduate students wanted to thank Professor Hunter for his "open door" policy concerning course load advice, teaching assistant matters, and general academic counseling. Despite this enormous workload, as well as conducting his own mathematical research, Professor Hunter found additional time in his schedule to help organize a weekly graduate student seminar. This seminar has blossomed under Professor Hunter's supervision, and is now an important forum for reporting research and other interests among the mathematics graduate students.

Professor Hunter received a gift certificate to the *Little Prague* restaurant in Davis at the annual Departmental Awards Ceremony on June 10, 1998. The Galois Group sincerely wishes that he and his guest enjoyed their meal!

Our second recipient joined the Davis faculty in 1996, and has subsequently become actively involved in the Graduate Program. In addition to stimulating exciting new research circles among the graduate students, Professor **William P. Thurston** has made personal contributions to the department which have benefited all graduate students. Foremost among these contributions is a substantial donation to upgrade graduate student computing resources.

Professor Thurston received a dated plaque at the Departmental Award Ceremony on June 10. The engraved plaque stated the Galois Group's appreciation for his efforts to improve the Graduate Program in Mathematics.

Roger J-B Wets shares 1997 Lanchester Prize

Roger J-B Wets and co-author, R. Tyrrell Rockafellar have been awarded the Frederick W. Lanchester Prize for their book Variational Analysis (Springer-Verlag, Berlin, published November 1997). Their book was recognized for its contribution in two areas. As quoted by the committee making the award, "this book succeeds in pulling together scattered results to create a unified and elegant whole. Equally important is its presentation of new ideas and new research results. The book provides advances in practically all the basic topics of modern optimization theory. In all, this book should serve as a landmark in the technical progress of

optimization, an essential technical tool of operations research and the management sciences." Congratulations Roger for this achievement!

Life After Davis

Submitted by Karen Horton (B.S. '95)

Bike circles, Coffee House study sessions, Math Club (Galois Group) lunches, Exploratorium visits, and oddly shaped bubbles-these are some of the things involved in receiving an undergraduate degree in mathematics at UC Davis. Perhaps more defining, though, is the atmosphere of collaborative learning, the exchange and discussion of ideas. In my very first calculus class, I learned that the study of mathematics is an interactive process and that my own appreciation and understanding of the subject could be greatly enhanced through discussion and debate.

As I progressed to upper division courses, I had the opportunity to learn from many talented instructors-both professors and graduate students-who encouraged their students to learn not only from the lectures or the texts, but from each other. Office hours and class discussions were group activities, with many voices weighing in. Considering problems from different perspectives taught me to appreciate the depth and complexity of mathematics, while explaining my own work to classmates gave me a small taste of some of the challenges and rewards of teaching.

These experiences convinced me to continue my education at the post-graduate level, and I am now in my fourth year of the Ph.D. program at UC Santa Barbara. The algebra and number theory that I loved as an undergraduate have proved to be more beautiful and complex than I could have imagined. I have been studying quantum algebras under the direction of Professor Ken Goodearl, and hope to complete my degree within two years. While working with students here-as a T.A. or as an instructor-I have kept in mind the great teachers that I had as an undergraduate; I remember with gratitude their patience, accessibility, and encouragement.

Submitted by Michael Penkava (Ph.D. '95)

I spent 6 years at UC Davis, as a graduate student from Fall 1990 until I received my Ph.D. in Spring 1995, and as a lecturer for the 1995-6 year. The job market at the time I finished my degree was less than encouraging, and despite the 165 applications I sent, I did not get any offers that first year. As it turned out, the year I spent as a lecturer was a very productive one for me mathematically. I solved a problem which I had been working on for about a year, wrote three articles, one with Lynelle Weldon (Lang), and began a collaboration with Pol Vanhaecke, who was a visiting research assistant professor at Davis at the time. I also sent out another 125 job applications, which finally led to my obtaining my current position as a tenure track assistant professor at the University of Wisconsin-Eau Claire (UWEC).

Eau Claire has about the same population as Davis, but the culture is quite different. We are the largest town in northwestern Wisconsin, so everyone does their shopping here, as a consequence there are a lot of department stores. People in Wisconsin are very friendly. It gets pretty cold in the winter, and the snow doesn't melt from when it first falls in mid November until sometime in April, but we also have lots of trees and rivers right in town, and the fishing is great.

The math department at UWEC has about 40 faculty members. The first thing that struck me about the place was how well the faculty got along. While the Wisconsin culture may be partly to blame, it is also the case that at liberal arts institutions, where the primary focus is on teaching, faculty members work together more closely, so more emphasis is placed on compatibility than at a research institution. This is something that job searchers should take note of. By the time a candidate is interviewed, their credentials have already been extensively reviewed, so one of the main objectives of the interview is to determine how well the applicant would fit in.

Last year, the math department at UWEC interviewed several candidates, so I have witnessed the job application process from both ends now. From this I learned that it is very important, when preparing the talk that you are expected to give at an interview that you gear it for the appropriate audience. It should be possible for someone who is not an expert in your area to come away from the talk having an idea of why your research is so exciting, so you want to paint the broad picture well.

In the two years I have been at UWEC, I have been active in my research, and the university has provided me with travel funding, so that I have been able to visit UC Davis several times to continue some collaborative work. One of the nice things about the position that I have is that there are many aspects to the job, so that I have been involved in writing grant proposals for technology improvements, working on curriculum development, trying innovative teaching experiments, doing some mathematical research, and

trying to find the right balance for me among all these exciting aspects of the life of a university professor.

The Sacramento Bee features
article on Virginia Johnson

Readers of this Newsletter may remember the article written by Virginia Johnson (1995, BS) in the "Life After Davis" section of the 1996 Newsletter (pp. 8-9). She is the student who entered college at age 14, never having attended high school, graduated at age 18 with a BS degree in mathematics, received a department citation, and went to UC Berkeley Law School.

The February 12, 1998 issue of the *The Sacramento Bee* features an article on the remarkable success of this UCD graduate under the title: "Dropout to be law school graduate at 20: Break from poverty took unusual path, including no high school."

Readers of this Newsletter can access the text of this article at http://www.sacbee.com/news/beetoday/newsroom/local/021298/local03.html.

The following excerpts from that article may whet the appetite to do so.

"Today, at 20, she's preparing for her first full-time job -- as an $84,000-a-year lawyer at a firm in Palo Alto.

"Instead of starting high school six years ago, Johnson enrolled in Sacramento City College, claiming to be 18. When she really was 18, she earned a degree in mathematics with honors and a Phi Beta Kappa key from the University of California, Davis.

"She'll receive a law degree in May from UC Berkeley's Boalt Hall, one of the top law schools in the country." …

"Davis professor Motohico Mulase remembers "her shining eyes and face in my classroom." It was the face he would turn to while lecturing in abstract algebra to see whether he had gotten his point across.

" 'I assumed she was going into mathematics. She was excelling in it,' he said.

"He didn't know her age until just before graduation." …

"Johnson will report full time to the Gray, Cary firm, where she has worked during school breaks for the past two years. She might wind up specializing in international corporate law, she said.

" 'And I imagine myself going back to school,' she added. 'I can't imagine not learning about other fields of law or other subjects.'

"She would like to learn to read the classics in Latin."

Staff News
by Tracy Ligtenberg

As the new Management Services Officer for the Department, I am pleased to have joined such a talented staff. Recently, we have hired two new staff members to replace positions vacated recently. Both **Celia Davis** and **Janet Roche** joined us in September - just in time for the beginning of fall quarter. Celia comes from Sociology where she had worked for several years as an administrative assistant and newsletter coordinator. In her new position in Mathematics she is an assistant to the Chair and MSO. Janet is new to the Davis campus, she recently worked as editorial assistant to an environmental science journal at Oregon Graduate Institute. As a part-time employee, Janet will assist in the Business Office preparing grants and processing payroll for readers. I am very happy to have these two new employees join our already strong staff.

ALUMNI NEWS

- **Allyson Abrams**, (1994, BS) is teaching at a community college in Portland. She received her MA from Portland State University in June 1996.

- **Joy (Sanfilippo) Fuson** (1993, BS) is an adjunct mathematics instructor at Los Rios Community College in Sacramento. She received an MA in mathematics in May 1997 at CSU Sacramento.

- **Lisa Jung-Eun Lee** (1992, BS) is a layout designer for Integrated Device Technology (IDT) in Santa Clara, CA.

- **Christina Lobao** (1996, BS) is in the CSU Hayward credential program. She is currently employed as a mathematics teacher at James Logan High School in Union City, CA.

- **Robert Lombard** (1990, BS) is a developmental mathematics instructor for CSU Northridge. Since he graduated from UC Davis, Robert received a single subject teaching credential and a masters of science in mathematics from CSU Northridge.

- **Irving Lubliner** (1988, MAT) is currently employed as Middle School Head and Mathematics teacher (grades 7 and 8) at Bentley School in Oakland, CA.

Peter Griffin Dies

Peter Griffin, who received an M.S. from the department and was one of its most widely known alumni, died on October 18, 1998 at age 61 of prostate cancer. His love for mathematics is not surprising: his grandfather was a prominent mathematician who served for a time as president of Reed College and his father was an actuary who ran an insurance company.

Peter is best known for his book *The Theory of Blackjack* of which the sixth edition is to be published in December. This book explores and explains the probabilities of every conceivable situation in the game. It was first published in 1979 and has sold about 50,000 copies since that time.

The depth of his mathematical analysis, the clarity with which he provided step-by-step explanations of complex calculations, and the book's humor delighted card sharks and mathematicians alike, making Mr. Griffin a highly popular figure among blackjack aficionados and opening up new vistas for him as well-traveled visiting expert at casinos and gambling conferences around the world.

Peter was a professor of mathematics at California State University Sacramento.

The Department of Mathematics
Newsletter Editorial
Henry L. Alder, Editor in Chief

The past academic year has been a successful one for the mathematics department with many significant achievements in research and teaching, some of which are reported in this Newsletter.

The new academic year just starting is bringing many changes in the administration of the department: Professor Motohico Mulase has been appointed chair of the department, effective July 1, 1998, and on January 1, 1999, Professor Allan Edelson will become Vice Chair for Graduate Affairs and Professor James Diederich Vice Chair for Undergraduate Affairs. In March 1998, Tracy Ligtenberg was appointed the department manager succeeding Judith Ryan who was promoted to a position in the School of Veterinary Medicine.

As usual we are delighted with the information you have submitted indicating the many different careers you are successfully engaging in, some of which are reported 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 on Virginia Johnson in this issue of the Newsletter.

The Department of Mathematics Newsletter

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- Henry L. Alder, Professor Emeritus

EDITORIAL BOARD

- John Gehrmann, Editorial Assistant
- Tracy Ligtenberg, Department Manager
- Motohico Mulase, Department Chair
- Sherman Stein, Professor Emeritus

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