

Berkeley

Mathematics

Newsletter

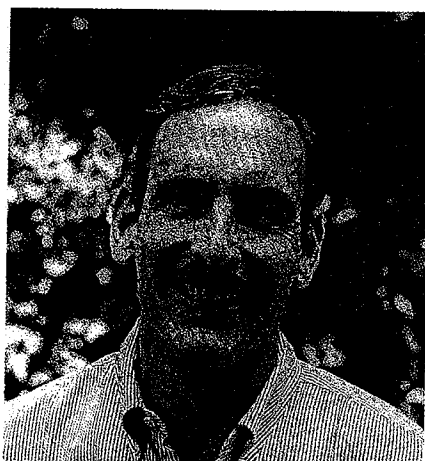
A newsletter of the Department of Mathematics and Center for Pure and Applied Mathematics at the University of California, Berkeley

Fall 2002 Vol. IX, No. 1

MESSAGE FROM THE CHAIR(S):

HUGH WOODIN (2002-2003) & TED SLAMAN (AFTER SUMMER 2003)

This is an important transition period for the Mathematics Department. June 30, 2002 marked the end of Calvin Moore's 6 years as Chair of the Department. His is an impossible act to follow; in a futile attempt we have two new Chairs. I shall serve for one year followed by Theodore Slaman who will serve for an additional three years or until he can find a successor.



CHAIR HUGH WOODIN

On behalf of the Department, I wish to thank Calvin Moore for his service, which I might add, is the longest in the history of the Department since Griffith Evans (1934-1949). The Department flourished under Calvin's leadership with the number of faculty growing from around 50 FTE to the current size of approximately 60 FTE. The same period has seen a surge in the number of undergraduate Mathematics Majors; we currently have around 550 majors.

Though the future of the Department is bright, we face serious challenges in the next two years. The state budget situation has translated to extremely serious cuts in the Department's budget. Next

year promises to be worse than this year. Meeting these cuts has required a number of extremely difficult and painful steps. For the Department, the difficulties are only amplified by the dramatic increase in the number of majors. This has caused enrollments in our upper-division courses to increase accordingly. In brief, we have fewer resources available to meet a workload that has increased significantly. We shall try to protect the quality of the undergraduate program as best we can, but the cuts are serious and, unless the funds are restored, our undergraduate program will suffer, as will the general working conditions for our faculty and staff.

Though I have served as Chair for only a short time, I am genuinely impressed with the dedication of the faculty and staff to the various missions of the Department. Already I find myself in debt to them for extraordinary service. I am increasingly confident that working together we will successfully pass through these difficult times.

FACULTY

Assistant Professor Tom Graber joined our faculty; previously Tom was a Benjamin Peirce Assistant Professor at Harvard University. Greetings to Assistant Professor Michael Hutchings who joins the Department after being on leave for the first year of his appointment, and the fondest of farewells (but we will not let him really leave) to Professor Elwyn Berlekamp who retired on July 1.

Professor Chris Shannon of the Economics Department has accepted a 0% appointment in the Mathematics Department. We look forward to her participation in departmental activities.

It was another typical year for faculty

honors. Some highlights from this year include the following: (A more complete list is included in the section on faculty honors.)

Professor Alexandre Chorin was appointed University Professor.

Professor Edward Frenkel received the 2002 Hermann Weyl Prize. This prize is given every two years by the Standing Committee of the International Colloquia on Group Theoretical Methods in Physics to scientists under the age of 35 for original work in the area of understanding physics through symmetries.

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Highlights

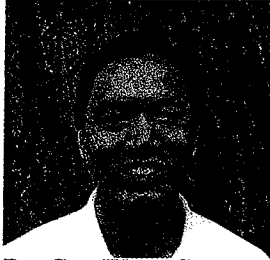
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POSTDOCTORAL FACULTY AND FELLOWS

HARUKO BRUCE

Dr. Chee Whye Chin, a Visiting Postgraduate Researcher, received his PhD this year from Princeton University. His research interests include arithmetic algebraic geometry, L-functions, and related questions. His current research is in the area of monodromy groups and independence-of-ell properties of a compatible system of ell-adic representations.



DR. CHEEWHYE CHIN

Dr. Carlos D'Andrea, a Miller Research Fellow, received his PhD this year from the Universidad de Buenos Aires. His research interests are in the areas of computational algebra, combinatorics, and algebraic geometry. He is currently conducting research in combinatorial and computational aspects of problems about polynomial equations.



DR. CARLOS D'ANDREA

Dr. Thomas Deschamps, an LBNL Postdoctoral Fellow, received his PhD from Université Paris-9 Dauphine in 2001. His main interests focus on computer vision and medical imaging with an emphasis on segmentation, visualization, and quantification. He makes use of partial differential equations for implementing Deformable Contours and Surfaces, following the Level-Sets method-



DR. THOMAS DESCHAMPS

ology originally developed at Berkeley by Professor James Sethian. He is currently working on a joint project with the Life Sciences Division, using these contours and surfaces for analyzing propagation of cancer in breast tissues.

Dr. Mehmet Erdogan, a Charles B. Morrey, Jr. Assistant Professor, received his PhD from Cal Tech in 2001. His field of interest is in harmonic analysis and partial differential equations. He is currently working on the mapping properties of averaging operators and their applications in Fourier analysis and geometric measure theory.



DR. MEHMET ERDOGAN

Dr. Dan Geba, a Charles B. Morrey, Jr. Assistant Professor, received his PhD from Princeton this year. His field of interest is partial differential equations. He is working on problems of local well-posedness for semilinear and quasilinear wave equations and on proving dispersive estimates for wave operators with rough coefficients.

Dr. Kevin Hare, an NSERC Postdoctoral Fellow, received his PhD from Simon Fraser University this year. His area of interest lies in computational number theory, including applications of Pisot numbers, the Integer Chebyshev problem, and Mahler measure problems.



DR. KEVIN HARE

Dr. Tara Holm, an NSF Postdoctoral Fellow, received her PhD this year from

MIT. Her research interests include symplectic and hyperKähler geometry, group actions, and combinatorics. She has worked on several projects using combinatorial data to describe the equivariant topology of symplectic manifolds with Hamiltonian torus actions. She has also studied Lagrangian and special Lagrangian submanifolds of symplectic and hyperKähler manifolds.

Dr. Alexander Holroyd, an Assistant Research Mathematician, received his PhD in 2000 from the University of Cambridge. His field of interest lies in the area of probability theory and phase transition. He is currently conducting research in discrete probability and randomized algorithms with emphasis on random matchings and cellular automata.

Dr. Elena Mantovan, a Miller Research Fellow, received her PhD from Harvard University this year. Her field of research is arithmetic algebraic geometry. She is studying the theory of (PEL)-type Shimura varieties in connection with the Langlands conjectures, in particular, the study of the geometry of the reduction of the Shimura varieties at some bad prime p . As these Shimura varieties arise as moduli spaces of polarized abelian varieties, with level structure, the study of their geometry fits in the more general framework of the theory of moduli spaces of abelian varieties.



DR. ELENA MANTOVAN

Dr. Jessica Sidman, an NSF Postdoctoral Fellow, received her PhD this year from the University of Michigan. Her interests lie in interactions between algebraic geometry, commutative algebra and combinatorics. She is currently working on questions related to describing the equations defining arrangements of linear subspaces.

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POSTDOCTORAL FACULTY AND FELLOWS

(continued from page 2)

Dr. Thomas Weston, an NSF Postdoctoral Fellow, received his PhD from Harvard University in 2000. His field of interest lies in arithmetic algebraic geometry with an emphasis on the algebraic study of special values of L-functions. He is working on some problems related to Euler systems on motives and non-abelian Iwasawa theory.

Dr. Von Bing Yap, a Visiting Postdoctoral Researcher, received his PhD from UC Berkeley this year. His field of interest is applications of statistics in computational biology, in particular, molecular evolution and comparative genomics.



DR. VON BING YAP

VISITING FACULTY

The Department is pleased to welcome **Professor Nicolas Burq** as a Miller Visiting Research Professor for the Fall Semester. He is visiting from the Université Paris Sud, Orsay. His interests lie in the study of high frequency behavior of phenomena governed by hyperbolic systems of equations such as the wave or Schrödinger equation, and more particularly in the context of control and scattering theories. He is currently working on the influence of geometry on the long-time behavior of solutions of non-linear Schrödinger equations. Ω



PROFESSOR NICOLAS BURQ

MESSAGE FROM THE CHAIR(S):

(continued from page 1)

Professor Vaughan Jones received the New Zealand Order of Merit, Distinguished Companion, as part of the Golden Jubilee honours of Queen Elizabeth II. This is the functional equivalent of knighthood.

Professor and Chair Theodore Slaman was awarded the Humboldt Research Award for Senior U.S. Scientists. This award offers the opportunity for an extended research stay in Germany – a particularly timely opportunity for him to be away from the Department.

Six members of the Department were invited speakers at the International Congress of Mathematicians held in Beijing last August. The Department had as many section speakers as Harvard and MIT combined.

GRADUATE STUDENT HONORS

The Morrey Prize was established in 1985 by Frances Morrey to honor the memory of her husband Charles B. Morrey, Jr., an outstanding Analyst and

6th Chair of the Mathematics Department. This prize has been awarded every year to one or more of our graduate students for outstanding research. This year the winners were Jaime Haletky, André Henriques, and Nicholas Proudfoot.

UNDERGRADUATE STUDENT HONORS

William Lowell Putnam Mathematical Competition is an annual competition which began in 1938 in order to stimulate a healthful rivalry in mathematical studies in the colleges and universities of the United States and Canada. It is administered by the Mathematical Association of America. This year the Berkeley team placed 4th (ahead of Stanford). Congratulations to the team members for this great showing. The team members were Maksim I. Maydanskiy, James M. Merryfield, and Austin W. Shapiro.

(continued on page 16)

WELCOME NEW FACULTY

Assistant Professor Tom Graber

After receiving his PhD from the University of California, Los Angeles in 1998, Tom Graber



ASSISTANT PROFESSOR TOM GRABER

taught at Harvard as a Benjamin Peirce Assistant Professor from 1998-2002. Graber was a NSF Postdoctoral Fellow at Harvard (1999-2001), a Sloan Dissertation Fellow from (1997-1998) and received a NSF graduate fellowship (1994-1997). He attended the University of Chicago (1997-1998) and was a visiting student at the Institut Mittag-Leffler in Djursholm, Sweden (1996-1997).

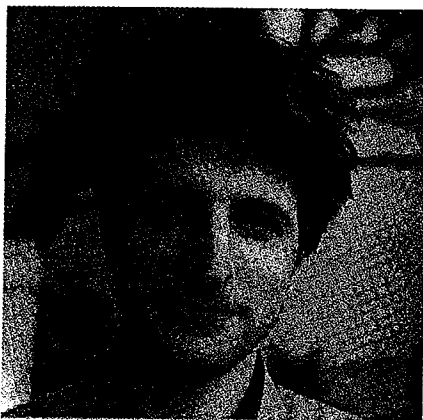
In 2000 and 2001, Graber was invited to give talks at Harvard, Princeton, Cornell, Oberwolfach, Boston University, Northwestern, Northeastern, Cal Tech, KTH (Stockholm), Notre Dame (AMS), and Columbia (AMS).

Graber's research interests include algebraic geometry, moduli spaces of curves, and the Gromov-Witten theory. Ω



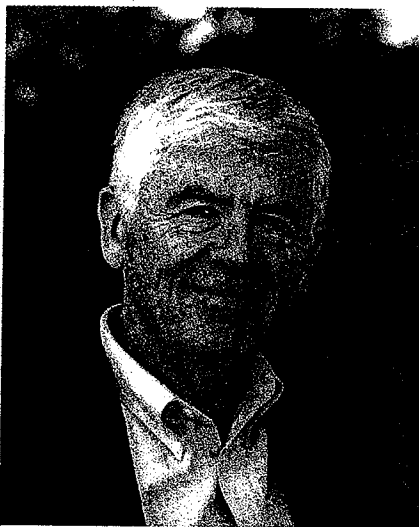
Honors and Awards

Dr. Matthias Aschenbrenner received the 2001 Sacks Prize of the Association for Symbolic Logic for the best PhD thesis in mathematical logic worldwide.



DR. MATTHIAS ASCHENBRENNER

Professor Alexandre Chorin was appointed as a University Professor in January, 2002 by the Board of Regents. This prestigious title of University Pro-



PROFESSOR ALEXANDRE CHORIN

fessor is reserved for scholars of international distinction who are also recognized and respected as exceptional teachers. Chorin will visit the 10 UC campuses, teaching and lecturing.

An outstanding scholar in applied mathematics and on the faculty at UC Berkeley's Department of Mathematics over the last 30 plus years, Chorin is also a senior scientist at the Lawrence Berkeley National Laboratory and is currently director of UC Berkeley's Center

for Pure and Applied Mathematics.

Chorin specializes in scientific computing, numerical analysis, and computational methods of statistical mechanics. His true love is turbulence, the chaotic eddies and currents in fluid, difficult to study experimentally and to calculate mathematically.

A second area of Chorin's research involves computations that are incomplete. The project he is working on is to figure out what is the best conclusion one can draw for the type of problem that is too complex or has too many unknowns, and therefore, has no hope of a complete calculation.

Dr. Ernest S. Croot III received the "Robert C. Anderson Memorial Prize" for excellence in research from the Uni-



DR. ERNEST S. CROOT III

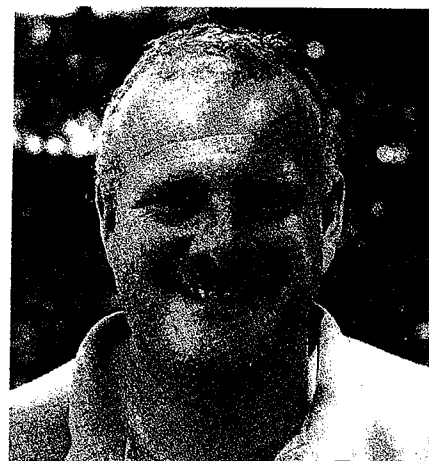
versity of Georgia this past spring. The pool of candidates for the prize was composed of graduate students or recent doctorates from all the disciplines at the university.

Professors James Demmel, Yuval Peres, James Sethian, Daniel Tataru, Hugh Woodin, and Maciej Zworski were invited to give presentations at the International Congress of Mathematicians (ICM 2002) in Beijing on August 28, 2002.

Professor Steven N. Evans was awarded a 2002 Miller Research Professorship. He was also honored as an Institute of Mathematical Statistics Medalion Lecturer.



PROFESSOR JAMES DEMMEL



PROFESSOR STEVEN N. EVANS

Professor Edward Frenkel received the 2002 Hermann Weyl Prize. This Prize is given every two years by the Standing Committee of the International



PROFESSOR EDWARD FRENKEL

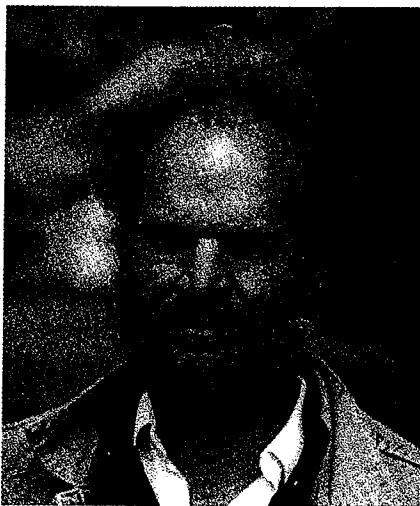
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Honors and Awards

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Colloquia on Group Theoretical Methods in Physics to scientists under the age of 35 for original work in the area of understanding of physics through symmetries.

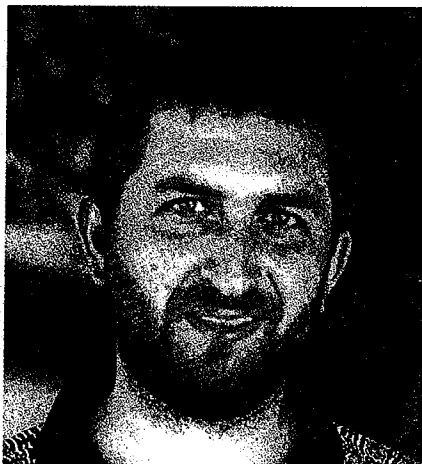
Professor Vaughan Jones has been honored by Queen Elizabeth II as a Distinguished Companion of the New



PROFESSOR VAUGHAN JONES

Zealand Order of Merit in her Golden Jubilee List of Honors. This honor is the functional equivalent of a knighthood. Without the change in terminology for the honor, instituted by the government of New Zealand in 2000, Professor Jones would henceforth be known as Sir Vaughan!

Professor Daniel Tataru was awarded the Bocher Prize by the American Mathematical Society at the Annual meeting in San Diego. He shares the



PROFESSOR DANIEL TATARU

prize with Terry Tao and Fanghua Lin. This is a major prize that is now awarded every three years in recognition of a notable research memoir in analysis.

Dr. Mayya Tokman received the 2002 Award for Outstanding Doctoral



DR. MAYYA TOKMAN

Dissertation in Plasma Physics from the American Physical Society Division of Plasma Physics. It is an award by the American Physical Society, established to recognize exceptional young scientists who have performed original doctoral thesis work of outstanding scientific quality and achievement in the area of plasma physics.

Dr. Mariel Vazquez was awarded a Project NExT fellowship for the aca-

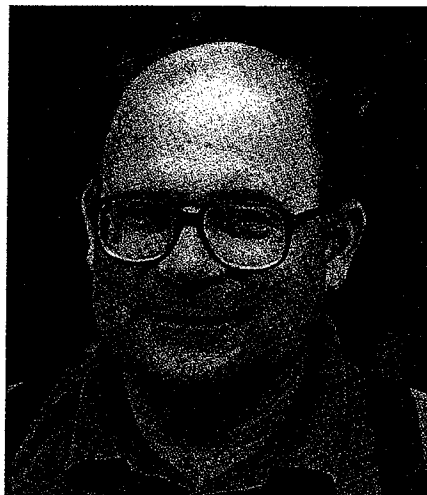


DR. MARIEL VAZQUEZ

ademic year 2002-2003. Project NExT (New Experiences in Teaching) is a program of the Mathematical Association of America for new or recent PhDs in the

mathematical sciences who are interested in improving the teaching and learning of undergraduate mathematics. This fellowship is supported by a grant from the ExxonMobil Foundation.

Professor Dan-Virgil Voiculescu received an International Blaise Pascal



PROFESSOR DAN-VIRGIL VOICULESCU

Chair. The Blaise Pascal International Research Chair allows the incumbent to work for 12 months during the coming 2 years on a scientific project at a higher learning institution or research institution in the Paris region. Ω



WHY THE HOLE IN ESCHER'S DESIGN?

SARA ROBINSON

Faculty member Hendrik Lenstra has been featured in the New York Times and many Dutch newspapers and magazines for discovering the mathematical structure underlying Dutch artist M.C. Escher's "Print Gallery," and creating a new, mathematically precise version of this popular artwork.

The Escher lithograph depicts a view, through a row of arching windows, of a man looking at a picture on the wall of a gallery. In the picture, a row of Mediterranean-style buildings along a quay looms larger and larger until it extends right out of the picture frame and expands around to include the gallery and the man within it. Smack in the center of the picture is a large, circular patch that Escher mysteriously left blank.

Bothered by the apparent blemish in the otherwise consistent structure of the picture, Lenstra, who holds a joint position at the Universiteit Leiden in Holland, set out to solve the mystery of the blank patch and understand the overall structure of the picture. His first step was to consult his copy of a book by Hans de Rijk, a friend of Escher's who had visited him several times during the creation of "Print Gallery." In the book, which was authorized and corrected by Escher, de Rijk described Escher's method in detail and provided the distorted grid that was his basis for creating the distorted picture from an ordinary quayside scene.

From looking at Escher's grid, Lenstra was able to deduce that the original, undistorted picture Escher started with was periodic with a multiplicative period of 256. He then realized that the Escher picture is also periodic, but with a complex period. This resolved the mystery of what belonged in the center: a smaller copy of the scene rotated almost upside down, containing an infinity of even smaller copies disappearing into a singularity at the origin.

Next, Lenstra set out to compute a value for γ , the complex period of the Escher picture. Armed with that, he would have a mathematical formula for creating such a picture. He'd already made some crude measurements of γ , and this seemed to be the best he could do — until he read a key sentence in de Rijk's book:

Escher's first attempt at creating the circular expansion of "Print Gallery," wrote de Rijk, used straight lines that gradually spread apart, but Escher was unhappy with this model because the buildings and windows of the picture would be overly distorted. So Escher curved the lines in his grid so as to ensure that "the original small squares could retain their square appearance."

After reading that sentence, Lenstra deduced that the transformation for creating the Escher was conformal. Knowing this, he was able to bring elliptic curve theory to bear on the problem of computing γ , and exactly compute the transformation, which turns out to be a complex exponential function.

For a fabulous web site containing pictures and animations of Lenstra's work, see escherdroste.math.leidenuniv.nl, a site maintained by Berkeley PhD Bart de Smit, who is managing the Escher project.

This piece was excerpted, with permission, from a longer article in the October issue of SIAM News. Ω



THE SEQUENCE BELOW SHOWS THE EFFECT OF REPEATEDLY ZOOMING IN BY A FACTOR 2.18 AND ROTATING BY 39.4 DEGREES. AFTER DOING THIS FOUR TIMES ONE RECOVERS THE ORIGINAL PICTURE.

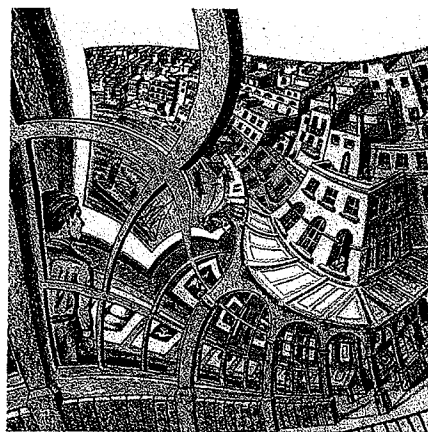


FIGURE 1



FIGURE 2

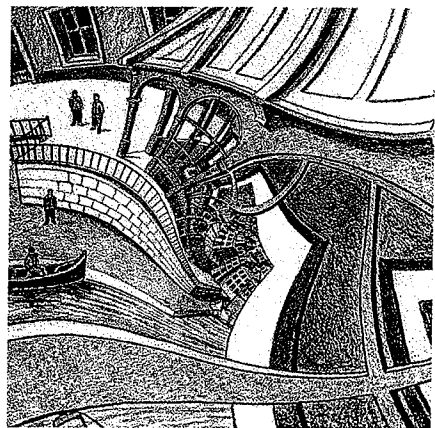


FIGURE 3

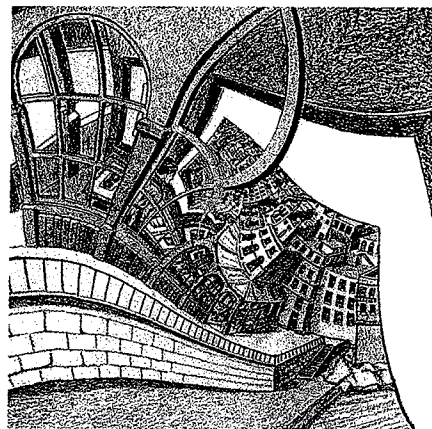


FIGURE 4



FIGURE 5

A HISTORY OF THE MURALS IN EVANS HALL

JOHN RHODES, PROFESSOR EMERITUS

Dear Colleagues,

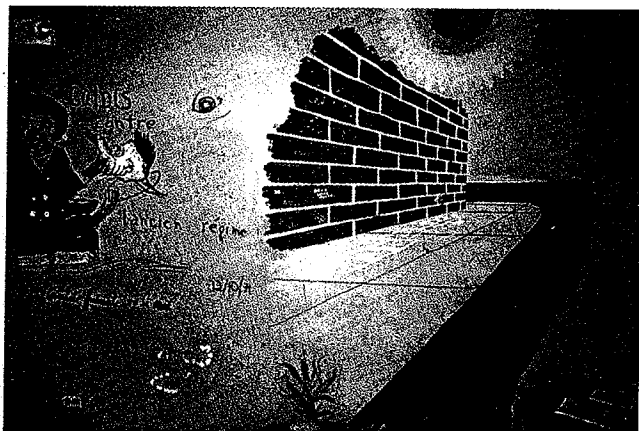
Greetings from Paris, land of retirement where I don't have to teach calculus anymore and can do math research all the time.



I wanted to comment on the history of the old "murals" on the 7th floor wall and elsewhere (in Evans Hall). In the late 1960s, (you can get the exact date from looking at the wall), Steve Smale and others started a departmental newspaper for students and faculty, unfortu-



nately entitled *Motherfunctor*, with interesting philosophical and math articles. It existed for a short time.



In this spirit, I assisted in organizing some seminars on creativity. I still remember one remarkable seminar where Cal Moore, Steve Smale, and S.S. Chern spoke. Smale said things like, "Math is

fill-in: integers to rationals, rational functions to holomorphic functions, etc., etc." Smale also noted: "It is interesting when one can prove a theorem and its negative, although that situation is usually resolved quickly."

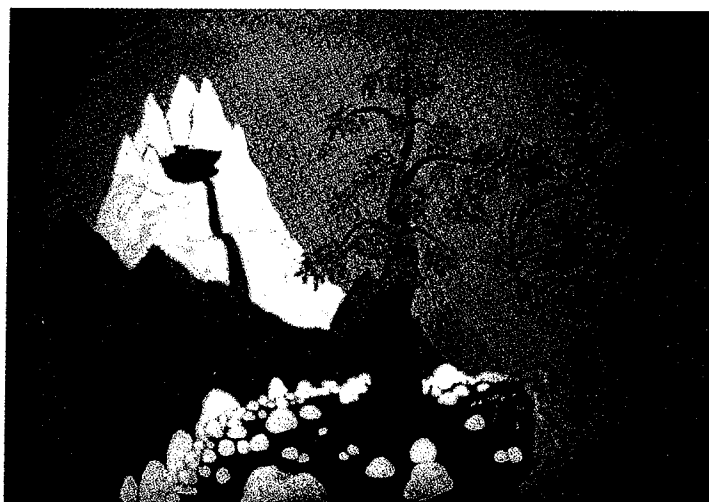
And I remember how he explained to the grad students that you would start trying to prove a theorem with A implies B , and that doesn't quite work, so it's $A + \text{something}$ implies $B + \text{something else}$, etc. And a year later you would have a completely different, true theorem!

Smale thought that we should let the government and the world know all about math, and it should be copiously supported by the society, in money and in prestige. Chern thought we shouldn't let anybody know what we were doing, because if they did know what we were doing, they wouldn't let anybody do it, it being so much fun. Chern added that society's knowledge of mathematics, together with inflation, were the great enemies to the professor on a fixed salary.

Sometime after this seminar, I organized a one-hour talk in 60 Evans

by an assistant professor in the architecture department entitled *Fascism and Architecture*, being as Evans Hall was despised by many as a dehumanizing workplace. The subject of the talk was the effect of architecture on politics and the spirit. I remember the speaker showed slides of Hitler waving to crowds from the balcony of buildings in Berlin.

After the applause abated at the end of this well-received talk, I passed out paintbrushes and paint cans. Even Sarah Hallam (senior administrative assistant of the Department for many, many years) grabbed a paintbrush. We rushed upstairs and painted some of the walls on the 7th to 10th floors.



Voilà! That's how the "murals" got there. Some were painted by famous mathematicians – Thurston and Sullivan. And I know *La Mort de Galois* on the 7th floor was painted by my son's uncle, Jack Knutson. I thought perhaps some of you – young and old – might like to know the history of these paintings. I hope as many of them can be preserved as possible.

Best regards.

Ω



HONORS FOR UNDERGRADS

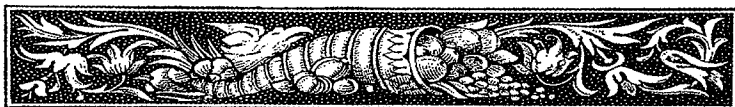
UCB team ranked fourth in 62nd Annual William Lowell Putnam Competition December 1, 2001

Each member of the UCB winning team, comprised of junior Maksim Maydanskiy, sophomore James Merryfield and sophomore Austin



AUSTIN SHAPIRO, JAMES MERRYFIELD, MAKSIM MAYDANSKIY

Shapiro, received a small monetary prize and a bronze medal. James Merryfield and Austin Shapiro also received honorable mentions. Nearly 3,000 contestants from over 400 colleges and Universities participated in the Putnam competition last year. The team rank was determined by the individual rankings of the three-team members.



MUSA BUILDS COMMUNITY

NOREEN HAROUN

One of MUSA's main goals for this year, 2002-2003, is to facilitate community building in the undergraduate mathematics community. We will be organizing both math-related and non-math-related activities, particularly reaching out to potential freshmen and sophomore majors.

"Math movie night" is one such activity. A few weeks ago we watched "Good Will Hunting". Other movies on our "to see" list include "A Beautiful Mind" and "Pie".

An informal undergraduate lecture series, which would give undergraduates a chance to talk to their peers about top-

Alice T. Schafer Mathematics Prize for 2002

The Mathematics Department has nominated Tatiana Yarmola, undergraduate senior in mathematics, for the 2002 Alice T. Schafer mathematics prize, a nationwide award for outstanding undergraduate women in mathematics.



TATIANA YARMOLA

Mathematical Contest in Modeling (MCM)

Undergraduate teams are forming in late October for the nineteenth annual competition in February 2003. The MCM is designed to stimulate and improve problem solving and writing skills in mathematics. For more info, please see Catherine Pauling or Dexter Stewart, 964 or 965 Evans Hall. Ω

ics they're interested in and/or researching, is being organized, as well as study groups for upper-division math courses. These study groups will give students a chance to meet others in their classes and go over concepts/problems among themselves that they otherwise would be struggling over on their own.

Fundraising endeavors are happening in the form of book sales every Monday and Thursday during Tea hour (3-4 pm) in 1015 Evans. The books are inexpensive, ranging from \$1.00-\$3.00.

In addition to books, MUSA is selling newly designed T-shirts, which are turning out to be very popular and sell-

MGSA NEWS

The MGSA officers for 2002-2003 are Megumi Harada, Matthew Harvey, Scott Morrison, and Nicholas Proudfoot. We already hosted the Fall 2003 Math Department picnic, which was held at Live Oak Park on a gorgeous Indian summer Sunday. We had great attendance by both faculty and students.

Another MGSA-hosted event was the Math and Music Night, which was held before Thanksgiving. Musical talents of friends and family were enjoyed by all.

The very beginnings of a new Berkeley Math Department T-shirt are in the works. We hope to have the T-shirts available before the end of the school year. If you have suggestions for designs, please let us know at mgsa@math.berkeley.edu, or drop by any of our offices.

One of MGSA's biggest innovations this year is the First-Year Mentoring Program. We have paired up all incoming "first-years" (including pre-PhDs) with older, friendly (!) graduate students who serve as their "mentors." This is in addition to the Mentor Lecture Series, lectures given by Berkeley faculty on Monday afternoons geared for beginning graduate students. We hope that mentors will help make the "first-years" feel welcome in this large department and give them perspective on the upcoming joys and challenges of graduate school.

Please contact us at mgsa@math.berkeley.edu if you have any suggestions or comments about what the MGSA could do to help the Mathematics community. Ω

ing fast! By mid-October, sweatshirts will be available, keeping the math community warm while giving all of us a chance to show our love for mathematics.

MUSA holds general meetings twice a month which are open to anyone interested in mathematics. These meetings give students an opportunity to meet, make suggestions, and voice their ideas about what they'd like to see MUSA do.

Our officers this year are Noreen Haroun (President), Nick Stahl (Fundraising Chair), Katherine So (Secretary), and Michelle Wong (Webmaster). We can be contacted at musa@math.berkeley.edu. Ω

NOTES FROM MSRI

MICHAEL F. SINGER, ACTING DIRECTOR

After having served as Deputy Director last year, I have moved on to become Acting Director while David Eisenbud



MICHAEL SINGER, ACTING DIRECTOR

is on partial leave. David is alive and well and doing mathematics on the third floor as a member of the yearlong Commutative Algebra program. In addition, he is still involved in fund raising and continues to offer a helping hand and advice (only when asked!).

Bob Megginson has come on board as Deputy Director. Bob has a long association with MSRI, having served as Chair of our Human Resources Advisory Committee and as a member of the Board of Trustees.



BOB MEGGINSON,
DEPUTY DIRECTOR

This fall marked the 20th anniversary of MSRI's first programs. The support of the UC Berkeley Department of Mathematics has been a key factor in MSRI's success. The original successful proposal to fund MSRI was submitted by Shiing-Shen Chern, Calvin Moore, and I. M. Singer in 1979. Since then, 430 UCB faculty and students have registered and participated in MSRI programs and workshops. Of these, 178 have come from the Department of Mathematics with the rest coming from 24 other departments and pro-

THE GOOD NEWS FROM MathSciNet

ANN JENSEN, LIBRARIAN

You may have already noticed something new in the MathSciNet database. Each review displays a small yellow icon near the right margin [UCelinks]. Currently, a click on that icon takes you to two different means of access: To the full electronic article for titles that have UC-wide licenses; and to the MELVYL catalog where the journal's location and call number can be found if an electronic version doesn't exist or if UC has no licensed access. Early in 2003, a REQUEST function will be added that will allow quick completion of an interlibrary borrowing request form for items not available electronically. And after some more work by both California Digital Library (CDL) and the local campuses, UCelinks will include links to electronic articles in titles licensed locally by UC Berkeley. Once this happens, UCelinks will provide one-stop shopping from within MathSciNet for the whole array of electronic materials available to you.

Librarians throughout the country have been lobbying vendors to adopt what is called Open URL architecture, which is the first requirement in enabling

this kind of access integration at the level of an individual article. I'm happy to report that AMS has been very receptive to librarian input, and they worked quickly to enable this facility. Open URL allows this customized linking of the resources within MathSciNet to the growing array of materials for which an institution has licensed access. In our UC environment, that translates to quite a lot of MathSciNet items.

And a gentle reminder regarding after hours access to the Math Library:

Please, do use the collection and take what you need, but try to remember to leave us a legible note with your name, ID number, and the call number and/or barcode of the book, so that we can find the item if we need it before you return it. Also, please take a moment to scan your office, at home and on campus, for any errant library book that might have found its way to your desks. Thanks.

As usual, please share with me any concerns you might have about the library collection or services.
ajensen@library.berkeley.edu Ω

NOTES FROM MSRI *(continued)*

grams. UCB Faculty have also been heavily involved in the direction of MSRI activities, contributing 47 of our program organizers and 34 of our workshop organizers. For a brief chronology of our early years, see <http://www.msri.org/20thanniversary/timeline.html>.

We have scheduled several events to commemorate our anniversary. As I write this in early October, we have just begun the CINEMATH film festival, jointly sponsored by the Pacific Film Archive. Films in this series are introduced by Dave Beyer, Keith Devlin, Ron Graham, and Bob Osserman and were chosen to provide an in-depth view of how mathematics has been presented in the movies as structure, metaphor, and story. To see a list of the films you can go to <http://www.msri.org/20thanniversary/cinemath.html>.

Another event in our celebration will be a panel discussion, "The Honors Class: Hilbert's Problems in Perspective". Moderated by David Hoffman, the

panel includes Benjamin Yandell, author of the "The Honors Class: Hilbert's Problems and their Solvers", Constance Reid, author of "Hilbert", Michael Atiyah, and Paul Cohen. Our celebration culminates with a reception and public talk by Michael Atiyah entitled "Geometry and Physics – from Plato to Hawking" on October 26. All our anniversary events are listed at <http://www.msri.org/20thanniversary/>.

In addition, this fall we have a program in Quantum Computing and in the spring a program in Semi-Classical Analysis as well as a yearlong program in Commutative Algebra. From the Berkeley community, Umesh Vazirani (CS) is an organizer of the first program, Maciej Zworski, Robert Littlejohn (Physics), and William Miller (Chemistry) are organizers of the second, and Bernd Sturmfels is an organizer of the third. For more information about our programs, workshops and other activities, come to our web-page, www.msri.org. Ω

MANAGER'S REPORT

LOU MAULL

IN MEMORIAM

In March, the Department suffered the death of student employee, Nicolai Rosen, who was found in his 9th floor office. This was his second year on the Berkeley Campus. Nicolai was a valued member of our Computing Services Unit where he worked for a year-and-a-half. He was a wonderful, bright, engaging young man who was a pleasure to work with and who will be sorely missed by all of us who knew him. His passing is marked with great sadness.

A FOND FAREWELL

The academic year 2001-02 closed with the announced retirements of 3 long-time staff, Catalina Cordoba, Deborah Craig, and Melanie Seepol. Hooray for each of them; boo hoo for us!

Melanie Seepol, after 12 years in Mathematics, retired on May 15th. Our most able and vastly overworked accounting and finance supervisor, Melanie



MELANIE SEEPOL

came to Math from History where she worked for 3 years. Prior to that, she worked for 4-1/2 years in the Forestry Dept. Melanie came to the Department as an Administrative Assistant and towards the end of her career was promoted to Administrative Analyst and supervisor of the Administrative Services Unit. Mel and her husband Jerry, who retired from ESPM, sold their Berkeley home and relocated to a wonderful "ranch" in southern Oregon with their dogs and horse.

Catalina Cordoba retired on August 15th, though her last day on the job was May 31st. Catalina had been in the De-

partment for 22 years. She started in the Faculty Services Unit and over the years took on the Group in Logic and the Meth-



CATALINA CORDOBA

odology of Science as the part-time graduate secretary. Her faculty services work would ultimately be replaced with student services work and culminated in her assuming the duties of Supervising all our Graduate Programs (Pure Math, Applied Math, and the Logic Group) as Student Affairs Officer II. Catalina was the mainstay of the Logic Group for 19 years and her retirement is a great loss for the group.

Deborah Craig retired from University service as of July 31st. Deb had also been in the Department for 22 years. Prior to that, she worked at LBL from 1976 to 1980. Deb started out with us



DEBORAH CRAIG

as a Principal Typist Clerk and worked her way through the Secretarial ranks to Principle Word Processing Specialist. For 22 years Deb provided impeccable secretarial services to a long list of distinguished mathematicians. She was al-

ways ready to help and willing to take on any task. Deb and husband Gary will be hitting the dusty trail to travel around the US and across the borders.

Catalina, Melanie, and Deb were the recipients of several distinguished service awards over the course of their careers in Mathematics. They are sorely missed by their colleagues and friends in the Math community. We are grateful for their long and excellent service to the Department and the Campus.

CHANGING PLACES AND NEW FACES

Thomas Brown was promoted to Supervisor of Graduate Programs to follow Catalina Cordoba. Thomas has been in



THOMAS BROWN

the Department for 2 years and worked with Catalina. Prior to joining the Department, he had worked for 3 years as a graduate advisor at Fuller Seminary in southern California. For 3 months he was the Interim Director of Fuller's Academic Advising. Thomas has excellent advising skills and is an asset to our graduate office. We are very pleased to have been able to promote from within the Department and look forward to a long and successful career for Thomas.

On September 1st, Nancy Palmer joined the Department following Melanie Seepol as Supervisor of the Administrative Services Unit. Nancy worked on campus for 2 years in the Engineering Research Lab's accounting unit. She brings many years experience in accounting, has a Masters of Science in Accounting and was a CPA in Florida. We are very pleased to have been able to recruit an employee with Nancy's credentials.

(continued on page 11)

MANAGER'S REPORT

(continued from page 10)



NANCY PALMER

We will not be filling Deb Craig's position, but have increased Faye Yeager's time from half to full-time. This is due to workload issues and budgetary needs.

OUTSTANDING STAFF IN MATH

Two staff members were recipients of campus awards this past year. Dave Hernes was nominated by Department colleagues for a Chancellor's Community Service Award, which are awarded



DAVE HERNES

to faculty, staff, and students. Dave has been very active on campus with the Holiday Toy and Food Drive. He started in 1996 and received over 300 toys and 900 lbs of food from 4 departments. Last year he received 700 toys and 2000 lbs of food from 21 departments. The toys go to the Marine Corps' Toys for Tots Program and the food goes to the Alameda County Food Bank. Dave also is very active at his local Catholic parish.

Our recently retired Melanie Seepol was nominated by her staff for an Ex-

cellence in Management Award. These awards are given annually by the Berkeley Staff Assembly. This year's theme was "leadership in challenging times" and particularly spotlighted supervisors who enhance staff morale, build an enriching environment, and serve as outstanding mentors to their staff.

We are very proud of these employees and their good works.

CAMPUS ON-LINE SYSTEMS MOVE ON

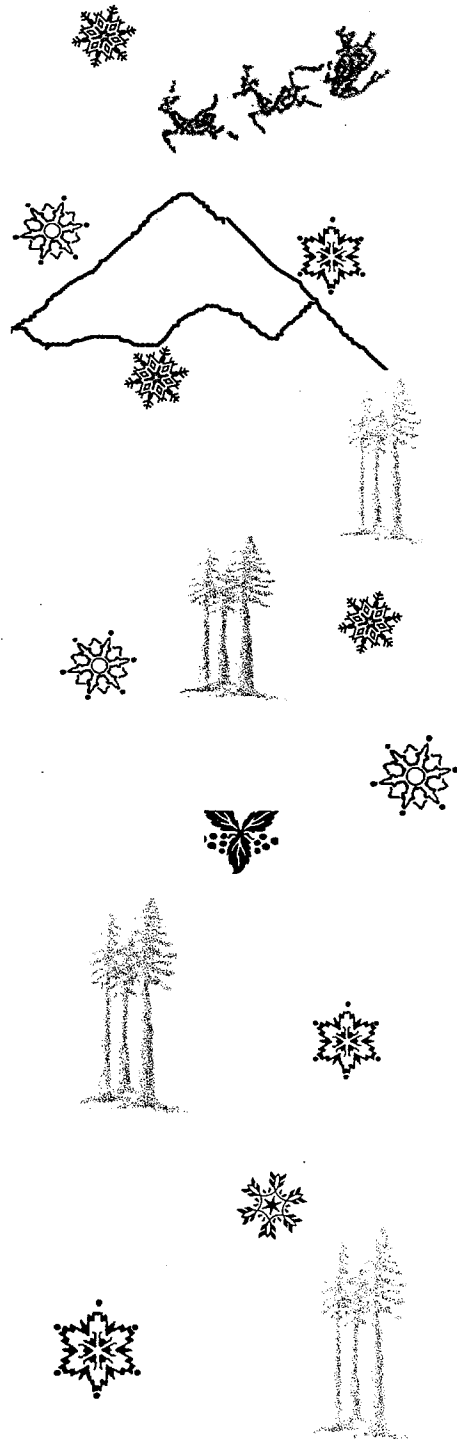
As of July 1st, the campus human resources processes finally went on-line. One-by-one, departments across campus have gone live. Math went up mid-August. That mythical document, the Personnel Action Form, has gone away as an input document, and is replaced with a new on-line process that takes place in our offices. This new personnel process rolls into the payroll system which also will be going on-line sometime in 2002-03. Though reporting modules are not yet available, we hope to see these during 02-03.

As our enrollments continue to rise, resources lose ground in the groundswell of workload increases and budgetary constraints. We are embattled as we proceed into 2002-03, and the prospects for 2003-04 are especially disheartening in the currently forecasted economic future. We struggle to provide the best education possible for our students.

Regards to all.

Ω

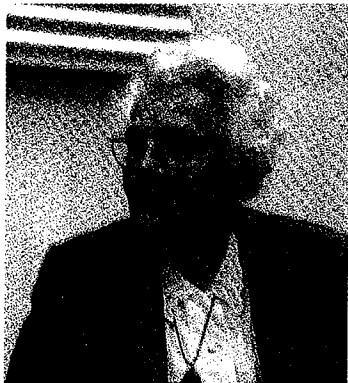
Happy Holidays from the Math Department!



FRANCES ELEANOR MOSS MORREY

EXCERPT FROM AN INTERVIEW WITH LOU MAULL IN 1995

Frances Eleanor Moss was a second generation Californian, born and raised in Oakland. She always knew she wanted to be a



FRANCES MORREY

teacher. She attended University High on Old Grove Street (now called MLK, Jr. Avenue), a scholastic experimental school linked to UC Berkeley. As a center for teacher training for UC, University High became a renowned public college-prep high school drawing an enrollment of 2,000 students in 1939 from all over the Bay Area.

Frances received her AB in 1933 and her MA in 1935 in Mathematics from UC Berkeley. She met Charles B. Morrey, Jr. late in 1933 when he came to the Department of Mathematics to teach. Frances had just begun her Masters program and was a Reader for the Department at the time. Together, they were both

active members of the Math Honor Society. They were married in 1937.

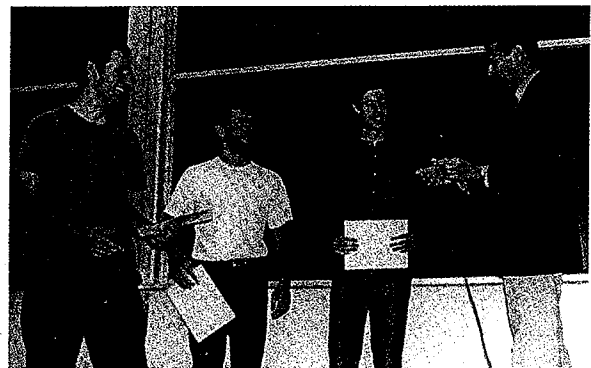
Despite the difficulty of finding permanent teaching positions in the post-Depression era, Frances was able to teach at different schools in the Oakland School District. With the arrival of their first child in 1941, Frances stopped teaching for 18 years to raise their 3 children.

The Morreys enjoyed traveling to the American Mathematics Society (AMS) meetings each August, taking their children on road trips and visiting many national parks and monuments on the way. They took sabbaticals abroad and witnessed many changes in Europe during the post-war decades from the 50s through the 80s.

In 1959 Frances returned to teaching mathematics part-time at Mills College. In 1961 she accepted a full-time position at Oakland City College, where she taught for 18 years. (Oakland City College used to be University High when Frances was in high school. After becoming a college, it was renamed, and again renamed to Merritt Community College, which is cur-

rently located in the Oakland Hills.)

At the death of her husband in 1985, Frances established The Charles B. Morrey, Jr. Award to honor the memory of her husband. Cash prizes of \$1,000 each are awarded each year to graduate students of promise to encourage the pursuit of doctoral research in mathematics. The 2001-2002 awardees were Jaime Haletky, André Henriques, and Nicholas Proudfoot. These 3 graduate students were able to meet Frances Morrey at the State of the Department Address, the last Mathematics function Frances attended.



NICHOLAS PROUDFOOT, ANDRÉ HENRIQUES,
AND JAIME HALETKY

Frances Morrey passed away September 21, 2002 from an acute heart attack. Her family will be establishing a scholarship endowment in memory of both Charles B. and Frances. Ω

IN MEMORIAM

ROBERT LAWSON VAUGHT

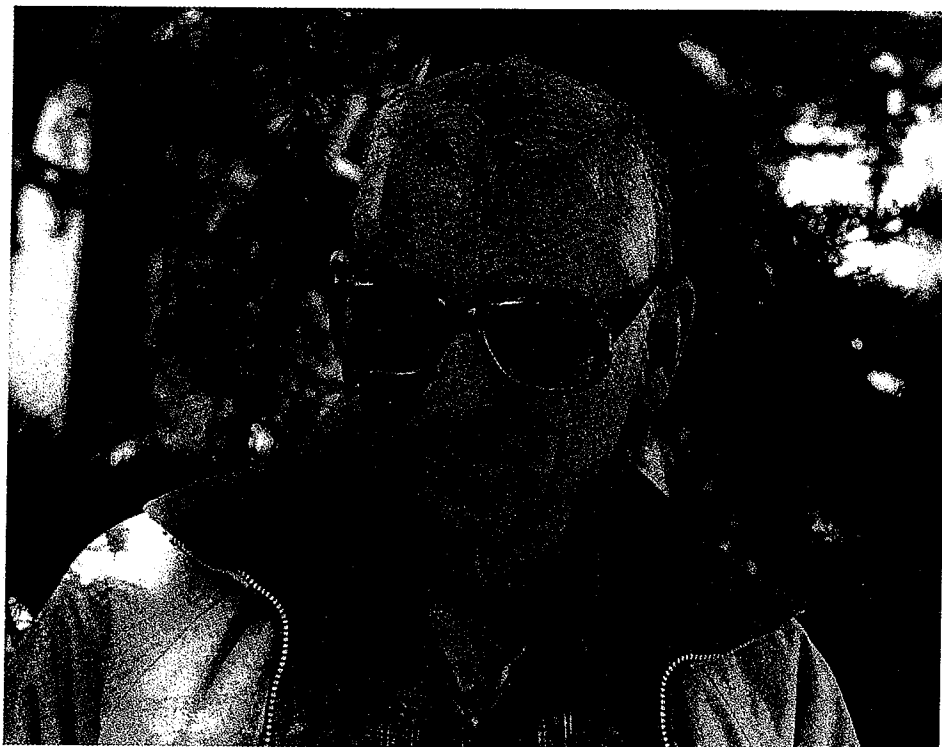
J. W. ADDISON

Robert Lawson Vaught, one of the great pioneers in the branch of mathematical logic known as model theory, was born in Alhambra, California on April 4, 1926. As a child he displayed a great talent in music and seemed headed toward a possible career as a pianist. His university studies, begun at age 16 at Pomona College, were interrupted by World War II; he entered the Navy and was placed in the V12 program at Berkeley, where he obtained an AB in Physics in 1945. After further training at Midshipmen School he completed his naval service in 1946 with the rank of Lieutenant jg and returned to Cal for graduate studies.

As a graduate student Vaught made (with John Kelley) an important contribution toward the solution of a major problem in the theory of C^* algebras before shifting his attention to logic and obtaining a PhD in Mathematics under Alfred Tarski in 1954. After a four-year teaching stint at the University of Washington, Vaught was called back to Berkeley in 1958 as Assistant Professor, rising to a Professorship in 1963 and teaching here until his retirement in 1991.

In addition to his lifelong love of music, Bob was an accomplished tennis player and an avid outdoorsman and mountain hiker. A frequent traveler to Hawaii, he also devoted some of his time in retirement to the hobby of investing. While living in Seattle Vaught met, and in 1957 married, Marilyn Maca. They had two children, Katherine and David, who, along with Marilyn and Vaught's granddaughter Diana and sister Gail Searcy, survive him.

Many of the fundamental concepts and results in model theory are due to Vaught. In 1957 he introduced with Tarski the notion of elementary submodel and in 1962 with Morley the



ROBERT VAUGHT

concept of a saturated structure. He will be remembered for the Tarski-Vaught criterion for elementary extensionality, the Feferman-Vaught product theorem, the Łoś-Vaught test for completeness and decidability, the Vaught two-cardinal theorem, his conjecture on the nonfinite axiomatizability of totally categorical theories (which led in time to geometric stability theory), the celebrated Vaught conjecture on the number of countable models of countable complete theories, and his paper "Invariant sets in topology and logic" (which he regarded as his best work) that introduced the Vaught transform and for which he was awarded the first Carol Karp Prize of the Association for Symbolic Logic in 1978.

Vaught's writing was noted for its great clarity. In 1985 he published a senior-level undergraduate text on set theory that was described by a reviewer as "impeccable in its precision, thoughtful in its historical and methodological commentary". He had a long line of dis-

tinguished doctoral students – Gebhard Fuhrken, Mitsuru Yasuhara, Jerome Malitz, Jack Silver, Martin Helling, William Reinhardt, James Baumgartner, James Schmerl, Julia Knight, Daniel Andler, Ronald Fagin, Steven Givant, Douglas Miller, Alan Adamson, Kenneth Schilling, Stephen Dyck, Shaughan Lavine, and Todd Hammond – and will be remembered by them and large numbers of other students and colleagues for his insight and his kindness and encouragement. Ω



NEWS FROM ALUMNI

From: **Herbert B. (Herb) Shulman**,
<hshulman@att.com>

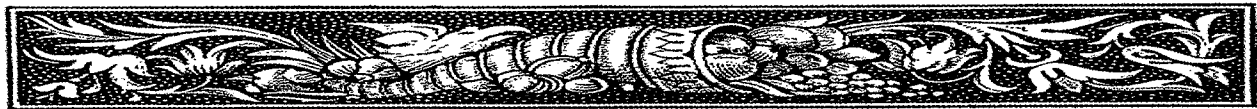
"Things have gone well. I've been with Bell Labs close to 25 years applying optimization theory to problems in inventory and network design, not nearly as interesting as Differential Geometry and Topology. I've kept all my old books and references and go back to them from time to time."

There is more information on his web page:
<http://www.att.com/networkandperformance/herb.html>

Yong-Geun Oh, who joined the Department of Mathematics at the University of Wisconsin as Associate Professor in 1992, was promoted to full Professor this last year. The Graduate School there also named Yong-Geun as a Vilas Associate for 2002-04, an award that provides summer salary support for 2 years and \$10,000 each year for support of his research. Yong-Geun plans to devote some time over the next few years writing a book on symplectic geometry and mirror symmetry.

Oscar Richard Ainsworth died June 1, 2001 at age 78. Ainsworth directed 20 students who earned PhDs in applied mathematics or engineering over the course of his 36 years as Professor at the University of Alabama.

Michelle Cheung graduated in 1990 with a BA in Mathematics and a minor in Business Administration. She worked as a Senior Business Planner for PG&E. Now Michelle is a consultant and a stay-at-home Mom. Ω



Alumni News & Update Form (please type or print, using a separate sheet if necessary)

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Last _____ First _____ MI _____

Degree & Year graduated: _____

Address Correction:

Email address: _____

Work - Position:

Institution or Company:

Location:

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What other types of articles or information would you like to read in future issues?

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The Department of Mathematics extends heartfelt thanks to all our donors over the past years for their generous support. Our donors have contributed to the strength and vitality of our students and the Department. The list of our donors from 1995-2002 can be found on the departmental website at <http://math.berkeley.edu/>.

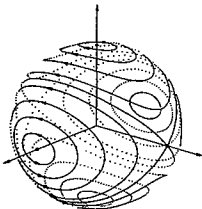


We apologize if we have omitted anyone. Please do let us know if that is the case. A special thanks to all our donors who wish to remain anonymous. Ω



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MESSAGE FROM THE CHAIR(S):

(continued from page 3)

IN MEMORIAM

I am sad to report the passing of three members of our community.

Last spring Nicolai Rosen, an undergraduate workstudy in the Department, died unexpectedly. The tragic aspects of death are amplified beyond comprehension when one so young and full of promise is taken from us.

Professor Emeritus Robert Lawson Vaught passed away April 2 of this year. A member of the mathematics faculty since 1958, Vaught retired in 1991 after 33 years of teaching. He maintained an active presence in the Department up until his death. I for one will miss his gentle sense of humor.

Quite recently, and suddenly, Frances Morrey passed away September 21. Frances was an enthusiastic supporter of the Department, regularly attending various departmental events. She was at the State of the Department meeting in August where she personally congratulated the current recipients of the Morrey Prize. Every year Frances would take the winners to lunch; in fact, in congratulating the current winners she was quick to inform them that she would be expecting them for lunch. Her presence will be greatly missed. Ω



CAL DAY 2003

Dear Alumni,

CAL DAY 2003 will be here again very soon. As Chair of the Mathematics Department, I invite all of our alumni to be a part of this special day when the University shows off what goes on here to the public and particularly to potential new students interested in attending UC Berkeley and their families.

If anyone is interested in giving a short talk or participating in a panel of alumni to talk about where a math degree has led them in their lives, I'd be happy to organize a time and place for this special event.

Additionally, if you'd like to visit your alma mater, meet the current faculty and staff, please let me know. I will do what I can to arrange such a gathering. Call, email, or write.

Best regards,

Hugh Woodin, Chair
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