Berkeley

Mathematics

Newsletter

Department of Mathematics
University of California at Berkeley

MESSAGE FROM THE CHAIR

By Jack Wagoner

Greetings to students, faculty, staff, graduates, and friends of the Department of Mathematics and the Center for Pure and Applied Mathematics. I hope you will enjoy reading this newsletter. Its purpose is to improve our communication and promote a sense of unity among our mathematics community. I also urge you to contribute items of interest to our future newsletters, for the success of this project depends on the continuing participation of us all. We welcome your comments and suggestions for improvement. Special thanks to our production team: editor/coordinator Rondi Phillips, copy editor Doris Smith, graphics designer and typist Debbie Craig, typist Faye Yeager, as well as the faculty, staff, and students who contributed articles. This has truly been a team effort.

I want to give a warm hello to our graduates. We haven't been the best at keeping in touch, but we hope to remedy that now. We want to hear from you and to learn what you've been doing. Please take a few minutes to share your news with us by filling out page eleven and mailing it to us. We invite you to join us at our various Department and Center activities, including future lectures and seminars of interest, as well as Commencement Ceremonies. We plan to have our second Winter Commencement in early December 1993.

I am happy to report that I have survived my first four months as the new Chair of the Department and that there have been many successes. Indeed, everyday I succeed in falling farther and farther behind on more and more important and difficult things. Nevertheless, we have actually thrived in many respects, and I would like to take

this opportunity to thank each of you who have given me and the Department so much help. It is impossible for me to list everyone individually by name in the space allotted here. So let me just say that I deeply appreciate the committed efforts of all the wonderfully dedicated people who have helped to create a renewed sense of teamwork and mission.

There is no doubt that we face difficult times ahead. But I firmly believe we can accomplish a great deal by working together toward the goal of maintaining the Department's and Center's roles as world leaders in mathematics. I want to encourage all of us in our mathematics community to reach out to each other, to seek ways to achieve unity and positive exchanges, and to continually strive to fulfill our mission of research, teaching, and service. Let me know how I can help support you in this endeavor.

LETTER FROM THE EDITOR

By Rondi Phillips, Editor

Hello!

It's great to have a vehicle in which to communicate to everyone at once. We especially value this opportunity to involve the Alumni of the Department of Mathematics at UCB in our activities.

As with all letters, this communication is only one way until you write back. I'm hoping you will write and send letters, articles, pictures, stories, and any other publishable material you can think of. We can create a dialogue, make announcements, share information, even show pictures if you want to send them.

At the back of this newsletter you will find a form to return to the Department of Mathematics, 970 Evans Hall, UCB, Berkeley, CA 94720. Please do send us your information and make this a two, three, several way communication.

Our next edition of this newsletter is planned for release in November. We need your articles by October 30, 1993 for that edition; however, send what you have and we can put it in the following newsletter if we don't receive it by October 30.

We are looking for photographers for events, especially those willing to work with black and white film. If anyone is interested, please contact me, Rondi Phillips, at 642-4024. My email address is rondi@math.berkeley.edu.

At this time, I would like to recognize invaluable help I have received in putting this newsletter together. I had no idea of how to begin and have learned so much from the manager of the department, Carolyn Katz. Additionally, Faye Yeager's computer skills set up the columns, transforming the articles into newsletter format, and Doris Smith's editing with Debbie Craig's lay-out skills brought this first edition into a reality. I thank all who put effort into this enterprise, including article writers, photographers, and editors. This really has been a complete departmental effort.

I look forward to articles for the next edition from our Alumni.

BUSY SUMMER AT MSRI

By Arlene Baxter, MSRI

The Mathematical Sciences Research Institute will conclude the busiest year in its history with three two-week workshops. The first, May 17 - 28, is part of the year-long program in Algebraic Geometry. The core participants will be a group of approximately 20 women students, both graduate and undergraduate, who will also participate in the RGI-sponsored summer program in Algebraic Geometry to be held in Utah.

MSRI will host a workshop on Universal Algebra and Category Theory July 12–24. The workshop, co-chaired by Saunders MacLane and U.C. Berkeley's Ralph McKenzie, promises to be an especially well-attended event.

The final event of the summer is a two-week workshop for graduate students of MSRI's sponsoring institutions, which now includes all of the UC campuses. The program will be led by Daniel Bump and Dinakar Ramakrishnan on automorphic forms and zeta functions, and will run from July 28 through August 10.

After its annual closing period from August 23 - September 6, the Institute will open the 1993-94 academic year with a "jumbo" program in Differential Geometry. This will be the only featured program for the fall; a half-year program in Dynamical Systems and Probabilistic Methods in Partial Differential Equations will begin in January 1994.
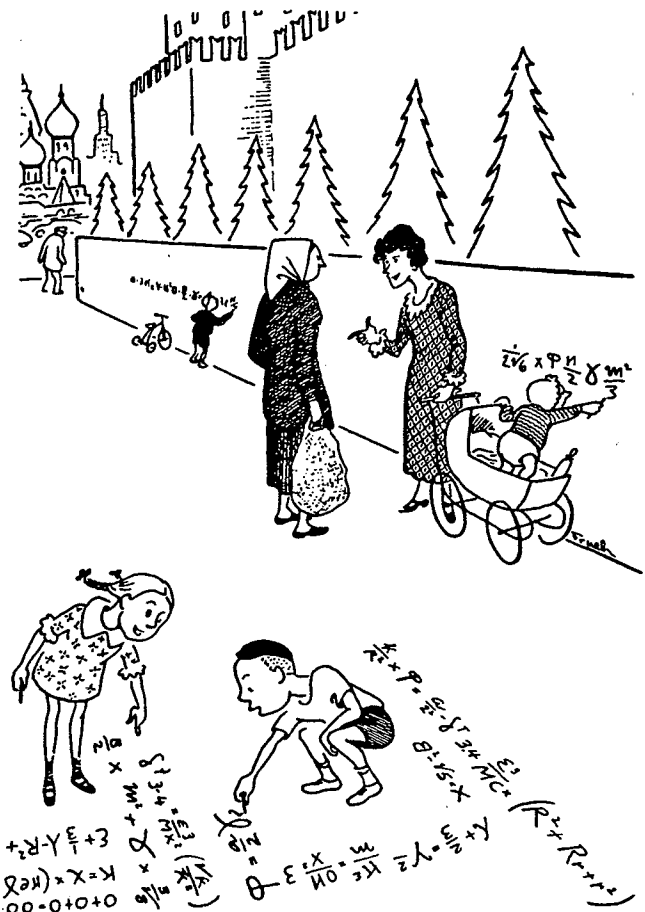
Drawing by Frueh. © 1958, The New Yorker Magazine, Inc.

As always, we have had a very busy year with the full round of our usual activities. Here are a few key items and events from 1992–93:

Budget Cuts

Foremost in the minds of everyone here are the desperate circumstances forced upon us by the state and university and even federal budgets. With dramatic cuts in state funding over the last four years, all UC departments are suffering. The Mathematics Department's faculty was seriously affected by two years of early retirement incentive programs, with 13 faculty taking part. While we were fortunately authorized to recruit two faculty positions next year (possibly bringing our total faculty to 58), we shall be at least 10 fewer than our previously budgeted level of 68 in 1991.

There are two parts to the cuts we are being asked to absorb during the 1993–94 academic year. The first is a cut of at least 5% to departments to cover still outstanding campus shortfalls for the academic year 1992–93. To meet this target, we will need to decrease our number of visiting instructors, who are a vital part of our program and bring fresh creative ideas to our community. We plan to essentially maintain our current "bare-bones" level of graduate student instructor support. However, we must virtually eliminate our readers for undergraduate classes, which will adversely impact our undergraduate and graduate student support. To minimize the impact of this change on our academic program, we will discuss the best method of implementation with our faculty and students. The second cutback comes

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"Difficult times ahead"

from a projected 7.3% decrease in funding to the university in the new 1993–94 state budget. To achieve this contraction, the faculty and staff are scheduled to receive one-time 5% paycuts, ceilings on benefits costs provided by the university are planned for January 94 implementation, and student fees will be increased steeply.

Unfortunately, the Department of Education National Need program will not solicit proposals for a new round of graduate student fellowships in the forseeable future. We have relied on this program over the past several years to provide several million dollars in financial support. The resultant lack of support will make it necessary to sharply limit the size of our Fall 93 entering class of graduate students in an effort to try to provide adequate support for the students who are here already. We are seeking every means to provide financial support to our graduate students in this climate of diminishing resources.
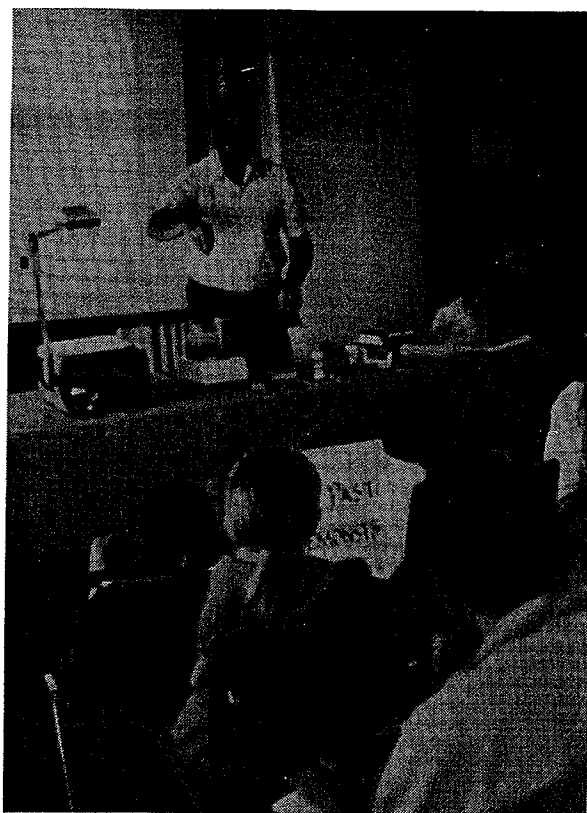
Prof. Schoenfeld giving pasta demonstration at Open House.

Students

My congratulations to all students who are receiving their degree this Spring. We hope you have found your time here in the Mathematics Department both productive and enjoyable, and I wish you well in whatever direction your life's adventure takes you. Please stay in touch with the Department by letting us know your new address so we can send you future editions of this newsletter.

During this past year, we have made significant strides to improve our communications between students and the Department. These efforts include ongoing meetings with leaders of the undergraduate (MUSA) and graduate (MGSA) associations, installation of a new telephone hotline, creating undergraduate student mailboxes, and reorganization of our bulletin boards. We will be seeking yet more and better ways to improve our communications with students and welcome all ideas.

Not only have our communications improved, but our cooperative ventures with students have been quite successful. We appreciate student volunteers who helped with projects such as our Halloween Party, Winter 92 Commencement and Faculty Retirement Reception, International Potluck Party, Campus Open House, and Spring Commencement 93. Student participation as part of our team was critical to bringing these events to life.

Strike

During the last month of the Fall 1992 semester there was a strike in support of recognition for the union AGSE by a number of graduate student instructors in various departments on campus. Generally speaking, the sciences did not experience as much of an impact as did other departments, say, in the humanities. It was a time of soul searching discussion and much "sturm und drang" across the campus. The strike ended around the beginning of the Spring 1993 semester without a resolution of the issues to the satisfaction of all involved.

Staff

Carolyn Katz became our new Mangement Services Officer in April 1992. Things haven't been the same since. More seriously, it was by a wonderful mix of chance, opportunity, and choice that Carolyn did join us. She immediately began a thorough review and transformation of our administration under the guiding principles of Total Quality Management, which emphasizes participatory management, teamwork, and customer service. Our staff morale has improved steadily. The working atmosphere has improved markedly. The staff has worked hard and with new enthusiasm to make changes for more productivity and efficiency. The faculty and students have already noticed significant improvements in the quality of service.

It is a pleasure to welcome new staff members who joined us in 1992–93. They are: Lou Maull (personnel and finance), Stephanie Reynolds (undergraduate affairs), and Marsha Snow (student services). Juliana Lopez (student services) is helping us on a short-term basis. And I regret to inform you of the death in April 1993 of André Washington, who had worked in student services for six years.

Staff and Manager celebrating Excellence in Management Award.

Faculty

During the 92–93 round of the early retirement program, four faculty chose to retire in October 92. They were Professors Henry Helson, Moe Hirsch, Jack Feldman, and Ray Sachs. I want to thank them for their many contributions to the Department during the past, and to encourage them to stay active in departmental activities. We consider our emeriti professors very special, and we welcome them at departmental meetings and events.

We would also like to extend a warm welcome to the new ladder faculty members who joined us this past year. They are Assistant Professor Vera Serganova (infinite dimensional Lie algebras), Assistant Professor John Strain (computational mathematics), and Professor Tom Wolff (classical analysis).

The faculty met recently up on the hill, at the Mathematical Sciences Research Institute facility, for the second annual one-day retreat to discuss issues of current import which include planning for the upcoming budget cuts, proposed revisions of the calculus course series syllabi, undergraduate research apprenticeships, language requirements, plans for Chancellor Tien's May 7 visit, the Campus Open House on April 24, TeleBEARS automated registration system, and overview of the graduate program and discussion of the preliminary exam. These informal discussions are very useful in generating ideas beneficial to to our Department and in promoting a spirit of understanding and camraderie.

"Retreat promotes camraderie"

Mathematics Computing Facility

A critical program need was identified in an extensive five-year planning review that occurred last Fall: the need to plan and implement a state-of-the-art computing facility. We proposed to our Dean and Provost this project for a development campaign, and requested the use of Rm 708 Evans Hall for this purpose. Graduate students located in this large partitioned room would be relocated into smaller shared offices comparable to other graduate office space in Evans. The space configuration in Rm 708 would be ideal for creating four areas for computing in instructional student labs, highly sophisticated research computing, an electronic-media teaching lab, and workstations for general student use.

Building a World-Class Mathematics Library

I am pleased to report that we are developing a proposal for future improvements to our Mathematics Library, including provisions for purchasing materials such as books, periodicals, video cassettes, and computer equipment. We also would like to expand space for shelving books and for much needed additional study desks. We will keep you updated in future issues.

Center for Pure & Applied Mathematics

In this issue, Director Alan Weinstein has reviewed several exciting research projects. It is important to point out that insufficient budget allocations for the National Science Foundation (NSF), our primary funding source for research, have created a chain reaction of reduced funding for our math research grants. Throughout the country, mathematicians have already received word that only one month of summer funding will be approved, graduate researchers have been cut out, etc... This is a source of great concern for our principal investigators and students. ∎

IN MEMORY OF ANDRÉ

By Rondi Phillips

André Washington was an artist, dancer, collector, investor, entrepreneur, and U.C. Berkeley employee in the Department of Mathematics. He came to the Math Department in 1987 and first worked in the Financial Unit. But his talent truly was with people. André moved to the Front Office where his abilities shone in advising students of their options, directing visiting faculty through the details of settling in at UCB, and guiding graduate students in Course Grade Reports and the grade change process.

Additionally, his entrepreneurial spirit benefited the department's budget as he procured free flowers and musical entertainment for Commencement Ceremonies. One year, he raised $1,000 from the annual booksale, at that time a joint effort of the department and the Math Undergraduate Student Association (MUSA).

André's artistic talents were equally demonstrated as in the dance performance he gave with his partner, Eva Apple, at the 1990 Departmental Dinner.

CAL OPEN HOUSE 1993

By Ralph McKenzie and Carolyn Katz

This April event provided a rare opportunity for the public, as well as students and those who work here, to get to know the University in a more intimate way. The exhibits, displays, films, talks, and information tables sponsored by our department had a steady stream of visitors, including parents with children, high school students interested in learning more about our program, and alumni. Visitors commented about the warm and friendly atmosphere, and seemed to appreciate having the chance to learn about math and our department.

Vaughan Jones' talk on the theme "Mathematics for a New Millenium" was one of the six keynote faculty lectures of the day.

As local coordinators of the event, we wish to thank and congratulate the following people who contributed substantially to making it a success (with apologies to anyone whom we've forgotten):

George Bergman, Dietmar Bisch, David Gale, Ole Hald, Leon Henkin, David Hernes, Vaughan Jones, Rafi Laufer, Silvio Levy, Ernesto Martinez, Keith Miller, Rondi Phillips, Charles Pugh, Nicolai Reshetikhin, Stephanie Reynolds, Alan Schoenfeld, Jamie Sethian, Doris Smith, Paulo Ney de Souza, William Thurston, Elinor Velasquez, Japheth Wood, Hung-Hsi Wu.

Thanks to André's persistent and tenacious belief in a better life on Earth and in the Mathematics Department, in particular, staff morale has improved significantly with a complete reorganization he instigated.

Many staff, faculty, and students mourn André's passing on April 17, 1993.

"L'HISTOIRE DE Q"

By Alan Weinstein,
CPAM Director

Rather than trying to survey all of the research being done by the faculty, visiting scholars, and graduate students in the Center, I will concentrate on one theme in this article.

During the 1970's and 1980's, many developments in mathematics and its applications were agglomerated into a field known as Nonlinear Dynamics or occasionally by the even grander name Nonlinear Science. A comparable development for the 1990's seems to involve the replacement of non-linearity by noncommutativity. There are enough people working on this subject in the Center to populate an "Institute for Noncommutative Science" if we wished to establish one.

The mathematical idea behind these developments comes from quantum mechanics, where the fundamental quantities (called q-numbers by Dirac) differ from ordinary classical quantities (Dirac's c-numbers) in that their multiplication is noncommutative. Of course, some examples of such quantities, such as matrices or quaternions, are well known, but what is new in the noncommutative world is the idea, extensively developed in the 1980's by Fields medalist Alain Connes, among others, that one should consider these non-commuting objects as "functions on a 'noncommutative space'".

It has been known for some time that the study of various kinds of spaces, algebraic, differentiable, topological, or measurable, could be reduced to the study of certain algebras of (complex valued) functions on these spaces. In these algebras, with their commutative operations of addition and multiplication, many geometric and analytic objects such as points, curves, measures, etc. can be reinterpreted as algebraic constructions. (For instance, a point in a space is identified with the set of all functions which equal zero at that point,

an ideal in the algebra of all functions.) The algebraic interpretations can then be applied to any of a large class of algebras, making it possible to apply geometric ideas to these objects. (Recall that an "algebra" is any vector space with an associative bilinear multiplication.) Until recently, the geometric language has been applied primarily to commutative algebras, but new techniques have now made it possible to geometrize the study of noncommutative algebras as well. Of course, the elements of such an algebra are not really functions on a space, but we can pretend that they are and talk about a "noncommutative" or "quantum" space.

If an ordinary space has the structure of a group, the group multiplication may be interpreted as an operation on the algebra of functions on the group. If a noncommutative algebra carries such an operation, the underlying "space" is called a *quantum group*.

"What are quantum groups good for"

What are quantum groups good for? One application comes from the theory of special functions. Such functions as the Legendre and Jacobi polynomials can be understood in terms of the theory of matrix representations of certain groups such as rotation groups and unitary groups. When these groups are "quantized" (i.e. their algebras of functions modified so as to become noncommutative), the resulting representation theory leads to modifications of the classical polynomials which depend on an additional variable q measuring the degree of quantization. (The value $q = 1$ corresponds to the classical limit.) A great surprise is that the resulting "q-analogues" of the classical polynomials were already invented by Euler. What is more, Euler even used the letter q to denote his extra parameter, a long time before the invention of quantum mechanics! The modern theory of quantum groups finally provides a conceptual basis for understanding these q-analogues.

Another application of quantum groups is to the theory of knots. When a picture of a knotted rope is drawn on a piece of paper, it is important to indicate at each crossing point which strand of rope is on top. It turns out that quantum groups provide just the right algebraic structure to "code" such pictures so that algebraic calculations can be used to tell when one knot is essentially differ-

ent from one another. And knots occur not only aboard ships, but at the microscopic level of DNA molecules; the study of the untwisting of linked helical chains has become the object of joint research between mathematicians and biologists.

Some of us work in the "border region" between commutative and noncommutative geometry. The basic structure for understanding this region is a "Poisson bracket" operation on a commutative algebra which measures the first little bit of noncommutativity which appears when q moves away from 1. The resulting *symplectic and Poisson geometry* is close enough to the commutative world to allow us to use our geometric intuition, but contains enough noncommutativity to give good predictions about the quantum world.

What's coming for the year 2000? My guess is that "Nonassociative Science" will be well established by that time. (V.G. Drinfel'd has already started laying the foundations). But maybe we will be ready to emphasize the positive in the new millenium!

Here are the names of some members of the Center and their noncommutative interests.

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Jörgen Andersen	Noncommutative and symplectic geometry in low dimensional topology
William Arveson	Algebras of operators and numerical quantum mechanics
George Bergman	Noncommutative ring theory
Dietmar Bisch	Von Neumann algebras, subfactors
Paul Chernoff	Connections between classical and quantum mechanics
Alexandre Givental	Symplectic geometry and symplectic topology
Alberto Grünbaum	Special functions and medical imaging
Vaughan Jones	Operator algebras, knot theory, and biology
Rob Kirby	Quantum groups and low dimensional topology
Jerrold Marsden	Hamiltonian dynamical systems and mechanics
Nicolai Reshetikhin	Quantum groups and topology
Marc Rieffel	Operator algebras and noncommutative topology
Dan-Virgil Voiculescu	Noncommutative probability theory
Alan Weinstein	Geometry of classical and quantum mechanics
Mariusz Wodzicki	Noncommutative algebraic topology
Joseph Wolf	Noncommutative harmonic analysis

(This gem was contributed by Herb Kanner (kanner@apple.com). It is a homework problem from a new book that his wife is reviewing. The book is "Calculus Preliminary Edition" by Deborah Hughes-Hallett, Andrew M. Gleason, et al.)

Problem # 9: In her "Guide to Excruciatingly Correct Behavior," Miss Manners states:

"There are three possible parts to a date of which at least two must be offered: entertainment, food and affection. It is customary to begin a series of dates with a great deal of entertainment, a moderate amount of food and the merest suggestion of affection. As the amount of affection increases, the entertainment can be reduced proportionately. When the affection has replaced the entertainment, we no longer call it dating. Under no circumstances can the food be omitted."

Based on this statement, sketch a graph showing entertainment as a function of affection, assuming the amount of food to be constant. Mark the point on the graph at which the relationship starts, as well as the point at which the relationship ceases to be called dating.
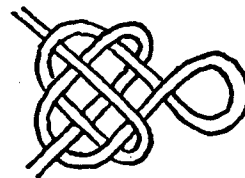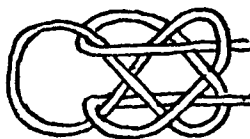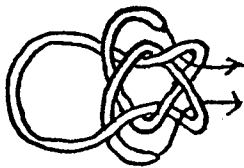
MANAGER'S REPORT

By Carolyn Katz

Welcome to our readers — all members of our mathematics community, a special greeting to our alumni and friends, and a sincere congratulations to our new graduates. This newsletter is yet another example of the power of teamwork: we accomplished it with the able assistance of Editor/Coordinator Rondi Phillips, Chair Jack Wagoner, Director Alan Weinstein, and the production team of Faye Yeager, Debbie Craig and Doris Smith. It is rewarding indeed to be a part of the synergy and comraderie which develops while working on such a project. To ensure its continuance, I ask for your help in replenishing us with ideas, articles, and photos.

This past year has been a year of many changes for us. Since joining the Department and Center as manager a year ago, I have taken initial steps in developing a supportive, healthy, and safe environment for staff: one which will promote creativity, assist staff in realizing their individual potential, and provide training and development opportunities through courses and cross training. We have initiated a Math Health*Matters group which discusses (and actualizes) exercise programs, nutritional awareness, and other ideas for achieving optimal health.

In our administrative operations, staff has been working non-stop on all fronts: planning for the future by identifying our academic program and research goals and seeking ways to improve communications and to create efficiencies in our operations. Our staff is especially interested in helping our students feel more at home here and to offer the best services possible to our faculty, students, and staff support team. Regardless of past reductions in staffing levels, we are looking to the future and are determined to ensure the viability of these new programs.

I have been impressed daily by the quality of work performed by our staff, and am excited by the sense of team spirit we have developed together. The size and complexity of this Department and Center bring a high volume of work to be processed. Though at times we have each felt overburdened by our workload, invariably we find another staff member is there, ready to pitch in and help out.

Communication is a primary aspect of our work life and a key component of many of the improvements we have implemented. Weekly meetings between supervisors and direct reports; monthly meetings with all staff; and continual sharing of information and "brainstorming" sessions are all an integral part of the participative approach to man-

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Service Excellence Program

I'm delighted to announce that our staff has joined me wholeheartedly in making a commitment to enter a new adventure in seeking ways to better serve our students, faculty, and visitors. During the upcoming year, we will be identifying and prioritizing the needs of those we serve, as well as analyzing various aspects of our operations to streamline processes and gain efficiencies. We launched this program in March with vision and mission statements for our administrative operations, special training sessions for supervisors, and a plan for partnership with the English Department and the Center for Particle Astrophysics. We are excited about this program, and ask your cooperation, patience, and support during its implementation. More details will follow in future newsletters.

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agement I've introduced. In addition, together we updated job descriptions and classifications, reorganized the administrative operations and staff structure, and clarified performance expectations of supervisors and staff.

Staff News

We were saddened recently by the death of Andre Washington, a dedicated employee who had endured a long illness. We shall miss him.

Jan Zimmerman, who had worked for us eight years, recently left the Department. We wish her well in her recovery to health, and in the new opportunities that await her.

We were pleased to welcome several new staff to the Department this past year, who filled key vacancies: Lou Maull, Supervisor of Personnel and Finance Unit; Stephanie Reynolds, Undergraduate Assistant II; and Marsha Snow, Student Services Assistant II in the Main Office. Each is an outstanding addition to our team.

In May, I will begin serving as a mentor for campus intern Sharon Pangburn, administrative analyst in Physical and Environmental Planning. Vice Chancellor Boggan and I will share responsibilities for guiding her through planning and developing a project for campuswide partnerships between academic and administrative support units. These partnerships should result in cost and time savings for many staff employees. Funding for her work on this one-year project is provided by the campus administration. Sharon will be sharing office space in Room 957 and I encourage you to help her feel welcome in our Department.

MARINA RATNER
Elected to the National Academy of Sciences

By Angela Guess-Westbrooks

Professor Marina Ratner of our department has been elected to the National Academy of Sciences. Marina Ratner was born in Moscow and received her Ph.D. in Mathematics at Moscow State University. She has been a member of our faculty since 1975. She was also elected to the *American Academy of Arts and Sciences* last year.

The National Academy of Sciences, founded in 1863, is a private honorary organization dedicated to the furtherance of science and engineering; members are elected in recognition of their distinguished and continuing contributions to either of the two fields. It was founded by an act of Congress to serve as official adviser to the federal government on scientific and technical matters.

MANAGER KATZ RECEIVES EXCELLENCE IN MANAGEMENT AWARD

By Lou Maull

In a unanimous vote of confidence, the staff members of the Mathematics Department and the Center for Pure and Applied Mathematics nominated Manager Carolyn Katz for an Excellence in Management Award. Each year for the past seven years, the Berkeley Staff Assembly (BSA) has called for nominations from staff across the campus of managers who demonstrate excellence in managing their personnel and resources. The BSA theme this year was "to recognize innovation and humaneness in adapting to straitened circumstances."

The staff of the Department of Mathematics is proud and pleased to have Carolyn as Manager.

Congratulations to Our '92–'93 Graduates

ALEXANDRE GIVENTAL
Recipient of the Sloan Research Fellowship

By Angela Guess-Westbrooks

Assistant Professor Alexandre Givental of our department is an honored recipient of the Sloan Research Fellowship. Alexandre Givental was born in Moscow, received his Ph.D. in Mathematics at Moscow State University in 1987, and joined the faculty here at UC Berkeley in 1990. His research focuses on singularity theory, symplectic geometry, and topology.

The Sloan Research Fellowship was established in 1955 to provide support and to stimulate fundamental research by young scholars of outstanding promise. This fellowship recognizes young scientists, often in their first appointment to the university faculty, who are endeavoring to set up laboratories and to establish their own independent research projects with little or no outside support.

Selection procedures for the Sloan Research Fellowships are designed to identify those who show the most outstanding promise of making fundamental contributions to new knowledge.

VAUGHAN JONES
Elected to the American Academy of Arts and Sciences

By Angela Guess-Westbrooks

Professor Vaughan Jones of our department has been elected to the American Academy of Arts and Sciences. Vaughan Jones was born in New Zealand and received his Docteur es Sciences, Ecole de Mathematiques, at Geneva, Switzerland. He has been a member of our faculty since 1985. He is also an honored recipient of the Fields Medal.

The American Academy of Arts and Sciences, founded in 1780, is an honorary society and interdisciplinary studies center. Its membership includes scholars and national leaders in four classes: mathematical and physical sciences, biological sciences, social arts and sciences, and humanities. It conducts interdisciplinary studies of current public, social and intellectual issues and seeks to bring together scholars and leaders whose research experience, or knowledge can help to clarify contemporary problems and place them in perspective.

GRADUATE STUDENT EXPANDING YOUNG MINDS

By Janet Yonan

A recent article in the Berkeleyan focussed on the work of **Duane Cooper**, a Mathematics graduate student. Duane has for several years served as an instructor for the Community Teaching Fellowship Program and the Professional Development Program. He has also served as a committee member and recruiter for the Department's Mathematics Opportunity Committee. In the Berkeleyan article, Duane was being praised for his efforts in the Professional Development Program (PDP). PDP is a Berkeley Academic Senate program aimed at promoting the academic success of minority and women students in fields where they are underrepresented. Through PDP he helped develop and taught a section of the new course, Mathematics 32. (Mathematics 32 prepares freshmen for Calculus and more advanced mathematics classes.)
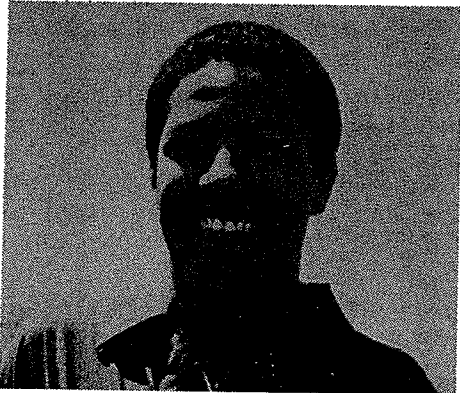
Many of his former students, most of them African Americans and Latinos, who have completed this class give Duane high marks as a teacher and credit him for teaching them to like mathematics. Indeed a number of them have volunteered as tutors to some 25 youngsters every morning before school and two afternoons in the Washington Elementary Enrichment Program which was launched by Duane.

At Washington Elementary School, they are using techniques used by their former instructor to inspire children. The task of capturing these youngsters' attention is very challenging, and seeing the steady improvement in their math skills makes it all worthwhile. "Many of these kids are talking about becoming mathematicians themselves" Duane says, "and that makes me proud" Being an African American himself, Duane hopes especially to inspire Black students of all ages to pursue and excel in mathematics.

Another program which he has been involved with on campus has been the Pre-College Academy (sponsored by PDP, MESA, and UCB Partnership Programs) which aims at teaching and inspiring talented San Francisco Bay Area high school students with an enriching curriculum including introductions to Number Theory, Graph Theory, and Group Theory.

Duane is expected to receive his doctoral degree in May 1993. The title of his dissertation is "Probably Approximately Correct Learning on the Class of Lipschitz Functions". He has secured a 1-2 year Postdoctoral Fellow position at the University of Maryland at College Park starting Fall 1993. His primary work will be on questions of Mathematics Education. Duane says that he has enjoyed his years at Berkeley and that it was particularly heartening to have the support of many in the Mathematics Department who were rooting for him to succeed during a difficult stretch he encountered.

We at the Mathematics Department would also like to praise him for all his efforts and services to the campus and the community. We wish him the best with his new position at the University of Maryland.

CONGRATULATIONS CATHY!

Catherine O'Neil was chosen as co-winner (with Dana Pascovici) of the 1993 ALICE T. SCHAFER UNDERGRADUATE PRIZE IN MATHEMATICS. The prize includes a monetary award. The committee reports that it was a pleasure to review the nominations because there were so many truly exceptional candidates. Ms. O'Neil's outstanding achievement in being chosen for the top prize is testimony to her work and abilities in mathematics.

Winners will be recognized on August 16 at the AMS-MAA-Canadian Math Society meetings in Vancouver, British Columbia, during a prize session and dinner in their honor.

ALUMNI AND FRIENDS NEWS AND UPDATE FORM

(Please type or print)

NAME:

Last _____ First _____ MI _____

ADDRESS CORRECTION:

WORK - Position:

Institution or Company:

Location:

Daytime Phone Number:

Electronic Mail Address:

PERSONAL AND PROFESSIONAL NEWS - Please let us know!

  Please type or print your news on a separate sheet, or attach news items, vitae, etc. directly to this sheet.

IDEAS FOR OUR NEWSLETTER:

  What items in this issue were of particular interest to you?

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

  How frequently would you suggest that we publish the newsletter?

  Do you have any suggestions for improving our future newsletters?

OTHER COMMENTS:

  Thank you for taking the time to help us plan for our next issue. Please return this form to Editor Rondi Phillips, Department of Mathematics, Rm 970 Evans Hall, University of California, Berkeley, CA 94720. (FAX number (510) 642-8204; tel. (510) 642-4024)

BERKELEY MATHEMATICS LECTURE NOTE SERIES

By L. Craig Evans

The Center for Pure and Applied Mathematics will soon be sponsoring the **Berkeley Mathematics Lecture Notes Series**, edited by Alan Weinstein and Craig Evans. This series will provide an opportunity for the mathematics faculty at UCB to make informal, graduate-level class lecture notes available to the Department and general mathematics community.

Our intention is to provide a venue for keeping graduate class notes updated, and also for trying out preliminary versions of new books. We plan to print up short runs of the various titles, and consequently make corrections and changes easily.

Forthcoming titles will include:

Numerical Linear Algebra, by James Demmel

Partial Differential Equations, by Craig Evans

Numerical Solution of Partial Differential Equations, by Ole Hald

Lectures on Geometric Quantization, by Sean Bates and Alan Weinstein

Lectures on Turbulence, by Alexandre Chorin.

Several other faculty members intend to submit class notes, and we will be eliciting further contributions as well. Submissions should be already typed, ideally in T$_{E}$X. Copyright will reside with the author.

We will later announce official information concerning titles and prices.

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