



# PRIME BITS

Department of Mathematics Newsletter  
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PRIME BITS brings news of current activities and events in the life of the Mathematics Department at Boulder to alumni and friends. Please send news items for inclusion to PRIME BITS (editor, W.B. Jones).

## NEW MATHEMATICS BUILDING AWARD

The new Mathematics Building and Leonard H. Gemmill Engineering Library was presented a *1994 Design Merit Award* by the *Denver Chapter of the American Institute of Architects*. Opened in September 1992, the Mathematics Building is the first free-standing academic structure built in the last 15 years. (See the photo.)

## NEW CHAIR AND ASSOCIATE CHAIR OF THE MATHEMATICS DEPARTMENT

Professor Robert Tubbs began serving as Chair of the Department in July 1993, following a sabbatical at the University of California at Berkeley. Professor Jeffrey Fox is serving as the Associate Chair of the Department. This has been a challenging time for both of them as the Department faces new financial constraints and, at the same time, takes significant steps to improve undergraduate and graduate instruction and to maintain vibrant research activity.

## UNDERGRADUATE MATHEMATICS

Recognizing its large responsibility to serve undergraduates at UCB, the Mathematics Department has made major changes in our course offerings and advising.

- Offering calculus courses in small sections has been found by students and faculty to have pedagogical advantages over the large sections (with approximately 150 students). Since the introduction of small sections of Calculus 1 two years ago, the enrollment has increased by 10% and, more importantly, the

number of students successfully completing the course (i.e., with a grade of C- or better) has increased by 20%, giving a success rate of almost 80%. Similar improvements have been made in Calculus 2. Due to staff limitations we still offer some large sections each year.

- Another gain derived from small sections is that we can offer different versions of calculus, tailored to the needs of our students. In the fall of 1994 we introduced a calculus course based on the Harvard calculus consortium and the Project Calculus Labs developed by the mathematics departments at Duke University and Bowdoin College. This course involves the use of *Mathematica* (software) in calculus and is especially suited to the needs of life-science students. The computer labs have had a positive effect by reinforcing the calculus ideas with numerical simulations and examples using real data.
- In addition to the traditional curriculum plan for Math majors, the department has introduced an alternative plan that puts less emphasis on theory and more emphasis on applicable mathematics.
- The department has introduced an evening-calculus Help Lab that provides individual assistance to students from 7:00 p.m. to 9:00 p.m. Monday through Thursday of each week.
- A new undergraduate course on Fourier Analysis has become one of our most popular courses.
- At present the Undergraduate Committee (chaired by Professor Richard Roth) has improved the advising of undergraduate Math



The Mathematics Building is located on Colorado Avenue, at the southern end of Folsom Street and adjacent to the Engineering Center on the west. The above photo faces a northwest direction. The lecture hall (MATH 100) is at the far left; the Gemmill Engineering Library is on ground and sub-ground levels in center; the Math Module Facilities containing a self-paced learning lab are ground level right; Mathematics Department offices are on levels 2 and 3, center and right.

majors and is working with the School of Business and the Department of Economics to develop a course that is tailored to the needs of their students.

#### MATHEMATICS CAREER NIGHT

In the fall of each year the department sponsors a *Math Career Night* at which a panel of graduates in Mathematics from CU-Boulder and elsewhere describe career options and professional occupations of mathematicians with undergraduate and/or graduate degrees. In the past two years panelists have represented the following positions and institutions: (1) software engineer at NCAR (National Center for Atmospheric Research), (2) resource analyst at the Colorado Dept. of Agriculture, (3) statisticians at Storage Technology, (4) faculty in mathematics at CU-Boulder and CU-Denver, (5) Math teachers at Centaurus and Boulder High Schools, (6) engineering systems group head at NCAR, (7) statistician from an actuarial consulting firm, (8) consulting engineer for Hewlett-Packard Corp., (9) environmental consultant at Enpro Consulting Co., and (10) production engineer at Ball Container Corp.

#### UNIVERSITY MATHEMATICS PROGRAM (UMAP)

Under the direction of Mathematics Professor Lawrence W. Baggett, the UMAP continues to improve its offerings of (mainly) pre-calculus courses. UMAP is responsible for the *Math Module Program* (directed by Laurie Feehan, Associate Director of UMAP) and the *QRMS* (Quantitative Reasoning and Mathematical Skills, directed by Dr. John Martin (1990 Ph.D. from UCB), Associate Director of UMAP).

The Math Modules consist of 11 courses (1 credit hour each) taught in a self-paced format; five of these courses deal with college algebra and trigonometry; three deal with probability, matrices and linear programming and three with calculus for social science and business. An additional 1-hour module on the

*Mathematics of Data* (elementary statistical methods) is being developed with funding provided by the office of Associate Vice Chancellor for Academic Affairs, Mark Dubin. Fine-tuning the mechanics of the Math Modules has eliminated unreasonably long lines experienced by students during final exams.

The QRMS course (QRMS 1010), formerly offered in one (350 student) large lecture format with labs, is now being taught in ten small sections. This change has resulted in better ratings of the course by students and an increase in the number of students who complete it. A new course (QRMS 2380) called *Math for the Environment* was designed by Mathematics Professor Martin Walter and is now offered by the Mathematics Department.

#### NORWEGIAN YEAR 1993-94

The Mathematics Department at CU-Boulder has a long tradition of collaboration with Norwegian Mathematicians, spanning a period of almost 40 years. CU-Boulder Mathematics faculty who have worked in Norway for one or more semesters include Professors L. W. Baggett, W. B. Jones, W. J. Thron (retired), M. E. Walter and the late Arne Magnus. Even more Norwegian mathematicians have worked at CU-Boulder for extended periods of time. A number of conferences and workshops for both faculty and students have been held in Norway and in Colorado to provide opportunities for collaboration and cooperative work. The academic year 1993-94 was a very special event in the Norway-Boulder connection, since 5 mathematicians from Trondheim, Norway were at CU-Boulder for all or large parts of the year. They gave lectures for the department's Kempner Colloquium, the Slow Pitch Colloquium and for a weekly seminar for both faculty and students.

They also participated in international research workshops held here during the summers of 1993 and 1994. To supplement the discussions of mathematics taking place during the year, one Sunday evening was devoted to a sharing of Norwegian history and culture

with Math Department faculty, staff, students and their families. The *Evening in Norway* included a display of Norwegian art and handcrafts, Norwegian folkdancing, color slides of Norway and Norwegian desserts. A photograph of the five visiting Norwegian mathematicians is shown below.

#### YEAR IN ANALYSIS 1995-96

During the period from summer 1995 through the summer of 1996 the Department is sponsoring two conferences and having two Ulam (visiting) Professors as part of a special year in Analysis. Professors Carla Farsi, Jeff Fox and Guoliang Yu have obtained funding for the two conferences from the National Science Foundation, Conference Board on Mathematical Sciences and the University of Colorado. In August 1995 they held a week-long conference featuring 10 lectures by Professor John Roe from Oxford University. For the summer of 1996 they are organizing a conference for

for the celebration of the 60th birthday of Professor Paul Baum from Penn State University. The second of these conferences is expected to be as well-attended as the first. Both conferences provide outstanding learning opportunities for our students and faculty.

Our two Ulam (visiting) Professors for 1995-96 are: Professor John Roe (Oxford) for Fall 1995 and Professor Nigel Higson for the entire year. Both visitors are lecturing in seminars and meeting with faculty and students.

#### STUDENT NEWS

Winning prizes from the UCB Mathematics Department for participation in the annual Putnam Competition sponsored by the Mathematical Association of America were: **Steve Soulé, Sarah Wheelan and Allan Hundhausen** for 1993 and **Gregory Geisher, Chris Hall and Mahesh Mahanthappa** for 1994.



The five visiting mathematicians from Trondheim, Norway during the academic year 1993-94 are from left to right: Professors Frode Rønning and Lisa Lorentzen, doctoral student Ragnhild Rensaa, and Professors Olav Njåstad and Haakon Waadeland.

**Mahesh Mahanthappa** is currently a junior at UCB majoring in both mathematics and chemistry with a grade point average of 4.00. Two years ago at age 16 he was the only Colorado high school student selected to compete in Washington, D.C. in the prestigious Westinghouse Talent Search. Mahesh was assisted in developing his science project on diophantine equations by two young members of the UCB mathematics faculty, **Professors David Grant and Eric Stade**.

**Sarah Jo Wheelan** received the Chancellor's Exceptional Achievement Award at the May 1995 UCB commencement, together with the B.A. degree, summa cum laude, with majors in mathematics, biochemistry and molecular, cellular and developmental biology (MCDB).

**Gwyn Coogan** (currently working on a Ph.D. degree in mathematics at UCB) is a world-renowned, long-distance runner. Gwyn won a first-place trophy at the 1991 Mobil Bislett Games in Norway, was a member of the 1992 U.S. Olympic team in the 10,000 meter event, and was the top American female in the 1994 World Cross Country Championships, placing 27th; she covered the 3.87-mile course in 21:33, just 48 seconds after the first place runner from Kenya. Only a few months prior to the race, Gwyn gave birth to a daughter, Katrina. Gwyn was able to complete the fall semester courses that she was taking, but she needed help meeting her duties as a teaching assistant. It is noteworthy that 17 members of the UCB mathematics faculty and graduate students volunteered their time helping Gwyn in her teaching duties!

**Sue Dettling** (a Ph.D. graduate student in mathematics) was recognized in April 1995 by the Minority Arts and Sciences Program for her outstanding work with students. Thank you, Sue, for your contribution to an important program on the Boulder Campus.

#### BURTON W. JONES TEACHING EXCELLENCE AWARD

An endowment for the *Burton W. Jones Teaching Excellence Award* was established in the CU Foundation in 1984 by gifts from the Mathematics Department faculty in memory of our distinguished colleague, Burton W. Jones. Each year income from the endowment is awarded to a Department of Mathematics graduate student who is chosen by the faculty of the department as the outstanding teaching assistant. Recent recipients of the award have been: **Catherine M. Bonan-Hamada** in 1992, **Simon Wong** in 1993, **Cathleen M. Craviotto** in 1994 and **Chris Moretti** in 1995.

Burton Jones was a graduate of Grinnell College and received his Ph.D. degree at the University of Chicago in 1928. He taught in the Mathematics Department of Cornell University from 1930 until his appointment at the University of Colorado in 1948. He served as chairman of the Department of Mathematics from 1949 to 1963, during which time under his leadership the department grew to a position of national prominence for its programs and faculty. He served again as department chair in the spring semester of 1967. Professor Jones retired from the faculty in 1971. Burton Jones received the Distinguished Service Award of the Mathematical Association of America in 1971 and an honorary doctorate from Grinnell College in 1973.

#### FRANCES C. STRIBIC FELLOWSHIPS

An endowment for the Frances C. Stribic Fellowship was created in the CU Foundation by a single gift in honor of the many contributions of Professor Stribic in the UCB Mathematics Department. Fellowships are granted each semester from the endowment income to two female graduate students in the Mathematics Department who are chosen by the faculty for their excellence as graduate students of mathematics. Recent recipients of the

Stribic Fellowships have been **Catherine Bonan-Hamada** in fall 1993 and spring 1994, **Cathleen Craviotto** in fall 1993 and fall-spring 1994, **Faan Tone Liu** in fall 1994, and **Dee Dee Shaulis** in fall 1994 and spring 1995. Francis Stribic received bachelor's and master's degrees from the University of Nebraska in 1920 and 1921, and completed all of her work there for a Ph.D. degree except the thesis. After serving as Mathematics Department Chair at Buena Vista College in Iowa and Wilson College in Pennsylvania, she joined the UCB Mathematics Department faculty in 1926. Finding a need for someone to teach statistics, she prepared herself in that subject and not only taught it for a number of years but also applied statistics for a research project with Professor Dorothy Martin of the Psychology Department. She was an outstanding teacher and was respected by students and faculty alike.

#### DE LONG LECTURES

This lecture series is funded by an endowment given by Professor Ira M. De Long, who came to the University in 1888 at the age of 33. Professor De Long essentially became the Mathematics Department by teaching not only the college subjects but also the preparatory mathematics courses as well. Professor De Long was a prominent citizen of the community of Boulder: president of the Mercantile Bank and Trust Company, organizer of the Colorado Education Association and president of the charter convention that gave Boulder the city manager form of government in 1917. After his death in 1942, it was decided that the bequest he made to the mathematics department would accumulate interest until income became available to fund De Long prizes for undergraduates and De Long Lectureships to bring to the campus each year an outstanding mathematician from elsewhere.

The De Long Lecture series was started in 1962 and the list of De Long Lecturers during the past 33 years contains many of the

world's most prominent mathematicians of the 20th century. This lecture series has contributed enormously to the academic climate in mathematics on the Boulder Campus. Its value to faculty, students and others who attend the lectures far exceeds the monetary proceeds of the endowment that make the lectures possible. The De Long Lecturers and titles of their talks in recent years have been: **Professor John Conway**, Princeton University, speaking on "Symmetry, Classification of Surfaces, and Quadratic Reciprocity" (March 8-12, 1993). **Professor John Tate**, Harvard University until 1990 and presently at the University of Texas, speaking on "Elliptic Curves, Modular Forms and Fermat's Last Theorem" (Sept. 20-23, 1993). **Professor Vladimir Arnold**, Moscow University (since 1950) and now jointly at Ceremade, University of Paris-Dauphine and the Steklov Mathematical Institute, Moscow, speaking on "Plane Curves, Topological Properties of Wave Propagation, Sturm Theory, Symplectic and Contact Geometry, and Dynamical Systems" (Feb. 20-24, 1995). Professor Arnold's lectures were sponsored both by the Mathematics Department and the Program in Applied Mathematics.

#### CENTENNIAL LECTURE

**Professor H. Halberstam**, University of Illinois at Urbana-Champaign, presented a lecture on "Culture, Curriculum, and the Calculus" on March 5, 1993 as part of the centennial celebration of the College of Arts and Sciences at UCB.

#### ULAM (VISITING) PROFESSORS

- 1993-94: Professor Gerald B. Folland (U. Washington at Seattle) lectured on Analysis.
- 1994-95: Professor Hans Schlickewei (U. Ulm, Germany) lectured on Number Theory and Professor Matatyaha (Mati) Rubin (Ben Gurion U., Israel) lectured on Reconstruction Problems (Logic).
- 1995-96: Professor John Roe (Oxford) and Professor Nigel Higson (Penn State) are lecturing on Analysis.

## FACULTY SPOTLIGHTS

**Carla Farsi**, who joined the UCB Mathematics faculty in August 1991, has been reappointed for an additional three years as an Assistant Professor. She has served a two-year term as the chair of the Kempner Colloquium (see subsequent remarks on the Kempner Colloquium Endowment). One of her most outstanding achievements in this capacity was making arrangements for the De Long lecturer, Professor V. Arnold from Moscow and Paris in February 1995. Her joint work with Professors J. Fox and G. Yu in organizing a special year 1995–96 on Analysis (Index Theory, Coarse Geometry and Topology of Manifolds) was reported earlier.

**David Grant** has been awarded a most coveted Faculty Fellowship by the University for the academic year 1995–1996. During the Fall Professor Grant is staying in Boulder to meet with his Ph.D. students. He will spend the Spring semester at Columbia University before spending a month in France.

**Karl Gustafson** gave the keynote address at a major international conference in Calcutta, India (Dec. 1992) and the Kolmogorov Lecture in Moscow (Jan. 1993). During a month in China (spring 1994) he gave two lectures in each of the cities: Hefei, Chengdu and Beijing. During six weeks in the summer 1994 Professor Gustafson presented research papers at international conferences held in Tour, France, in Copenhagen, Denmark, and Coimbra, Portugal. Professor Gustafson's research spans a wide variety of topics in mathematics, applied mathematics, computational mathematics and mathematical physics. This can be seen from the titles of some of his lectures: "Hovering Aerodynamics," "Antieigenvalues in Science and Numerical Analysis," "Neural Networks in Optoelectronics and Inductive Inference," "Computational Physics," "Cavity Flows and Hovering Flows," "Operator Spectral States," "Biological Aerodynamical Systems" and "Operator Trigonometry and

Numerical Range." Professor Gustafson's textbook, *Partial Differential Equations*, was translated into Japanese in 1992 and published in its 3rd edition in India in 1993.

**Henry Hermes** was selected by the Council on Research and Creative Work at CU-Boulder to give the Distinguished Research Lecture on October 27, 1993. This award is the highest honor bestowed by the UCB faculty upon its members. Each year two UCB faculty members who are internationally recognized for their achievements receive this honor. His lecture, entitled "In and Out of Control," was based on his research, centered on geometric control theory. This branch of mathematics involves the control or regulation of physical systems and it has many technological applications. These include: calculating trajectories and orbits for spaceships and satellites, robotics, automatic pilots for aircraft, and anti-lock brakes and cruise control for automobiles.

In April 1995 Professor Hermes presented another public lecture, this one for the weekly Kempner Colloquium in the Mathematics Department. This lecture, entitled "A Mathematical Model for the Analysis and Control of Cardiac Arrhythmias" was based on Hermes' most recent research. Its goal is the prevention of "sudden death" in athletes caused by arrhythmias.

**John H. Hodges** retired officially from the UCB in May 1993 after 33 years in the Mathematics Department. Having continued teaching one course per semester for the past two years, Jack says that "It's a very strange feeling for me to know that for the first time in 35 years my name doesn't appear on our department's schedule of courses." Professor Hodges has served as the department chair, has been thesis advisor for many doctoral and master's degree students and has received every teaching and service award given on the Boulder Campus. Jack's wife, Jean, also retired in June 1995 from an outstanding 15-year career

as the Director of the Boulder High School Theater Program. Among the adventures they're planning for their new life are: (1) grandparenting two babies, (2) doing some long desired traveling, (3) devoting their energies to working for social changes that they see as vital to our community, state, nation and world. Photographs of Jack and Jean and the UCB mathematics faculty taken at Jack's retirement party in May 1993 are shown on the next page. Jack and Jean, we all wish for you many good retirement years.

**Richard Holley** has become ever more active in the training of our graduate students. During the summer of 1994 Professor Holley met weekly with the graduate students who were studying for the Ph.D. exam in Analysis. This greatly improved the students' performance on the exam over previous years and proved to be so successful that Professor Holley "coached" the new students in the summer of 1995.

Professor Holley currently has the largest number of M.A. and Ph.D. students of any departmental faculty member.

Additionally, Professor Holley has been very active in our Calculus reform movement. This year he is teaching a section of Calculus applying the techniques of "cooperative learning" and utilizing graphing calculators as a tool.

In June of 1993 Professor Holley was invited to give 5 lectures at an international conference on probability and statistics at the University of Sao Paolo, Brazil. His talks provided a survey of the recent advances on the theory of stochastic processes.

**William B. Jones** presented the first Annual Arne Magnus Lecture at the Department of Mathematics, Colorado State University in April 1993. He also gave invited lectures at international mathematical research conferences held at the University of Antwerp, Belgium in September 1993, Purdue University in December 1993, the International Center for Mathematical Research at Luminy (Mar-

seille), France in September 1994, the Mathematical Research Institute at Oberwolfach, Germany in March 1995 and at summer meetings held on the Boulder campus in 1993 and 1994. Professor Jones was a co-organizer of the two Boulder conferences.

**Arlan Ramsay**, on a sabbatical leave in the spring of 1994, spent 5 weeks at Flinders University in Adelaide, South Australia, collaborating with Professor William Moran. He also made shorter visits at the University of Newcastle (NSW), the University of New South Wales and the National University of Singapore. Professor Ramsay gave lectures at each of these universities.

**Wolfgang Schmidt**, Distinguished Professor of Mathematics at UCB, was elected to the American Academy of Arts and Sciences in 1994. Schmidt is one of only nine CU-Boulder faculty to have been honored by the Academy. The American Academy of Arts and Sciences was founded in 1720 by John Adams and other early American leaders to "cultivate every art and science which may tend to advance the interest, honor, dignity and happiness of a free, independent and virtuous people."

In November 1994 Professor Schmidt was awarded an honorary doctorate by the University of Paris (Sorbonne). This degree was given to Schmidt for his life-long contributions to number theory. He is credited with several major discoveries during his career that have fundamentally changed his field. The Sorbonne awards an average of only two honorary doctorates in the sciences each year to esteemed scholars around the world.

From June 26 to July 1, 1994 a *Symposium on Diophantine Problems in Honor of Wolfgang Schmidt on his 60th Birthday* was held at the CU-Boulder campus. The symposium, organized by Professors David Grant and Rob Tubbs, was attended by more than 100 participants. The 20 main speakers at the symposium are among the leading number theorists in the world; two are recipients of the Fields





Professor John H. Hodges and wife, Jean, at the retirement party given for Jack in May 1993.



The Mathematics Department Faculty in May 1993 at a retirement party to honor Professor John H. Hodges after 33 years of service to the University.

Medal (the mathematical analogue of the Nobel Prize).

**Eric Stade** has been very active in research, having been awarded a three-year National Science Foundation grant in 1994 and having extended his research from Number Theory to Physics. He has also been very productive with undergraduate curricular reform. He has developed a new undergraduate course on Fourier Analysis which has become one of our most popular courses. In the Spring 1995 he also took over our lower division statistics course. In order to redesign that course Professor Stade attended a National Science Foundation workshop on statistics education in the summer of 1995. Professor Stade remains one of our most popular teachers.

**Lynne Walling** was promoted to Associate Professor with tenure in June 1995. We congratulate Lynne on the well-deserved promotion and celebrate the expectation of her long-term use of creative abilities in both teaching and research for the Mathematics Department at UCB. In 1994 Lynne was awarded a two-year NSA grant and was a finalist for a Boulder Faculty Assembly teaching award. She also served as a co-organizer of the 8th Annual Workshop on Automorphic Forms and Related topics held at the University of California at Santa Barbara.

**Guoliang Yu**, who came to the UCB faculty in August 1991, has been reappointed for a three-year term as an Assistant Professor. Professor Yu has taught a variety of courses at all levels including calculus, introduction to analysis and differential geometry. His collaboration with Professors J. Fox and C. Farsi in organizing a Special Year in Analysis were reported earlier. Professor Yu gave invited lectures at the Fields Institute of Mathematical Sciences in Canada (Sept. 1994), and at an AMS Special Session on Deformations in San Francisco (Jan. 1995). He was invited to the Max-Planck Institute, Germany during the summer of 1996 and will give an invited lecture there in January 1996.

**Jeff Fox and Marty Walter** were recognized on April 27, 1995 for their work on the Minority Arts and Sciences Program board. We owe our thanks to these two faculty members for their service to an important program on the Boulder Campus.

#### RETIRED FACULTY

**William E. Briggs** has used his retirement for the benefit of the University of Colorado. At the request of the Boulder Faculty Assembly (BFA), he served on a committee of prestigious members of the faculty (Hal Evjen, W.E. Briggs, Gilbert White, Hazel Barnes, Roland Rautenstrauss and Courtland Peterson) to make a study and then report on the Boulder Campus Administrative Structure. The committee was subsequently asked to extend its study to the entire CU four campus system. Their report, completed in June 1994, concluded that there was a great deal of waste and duplication in the CU Central Administration (Office of the President) and that much, if not all, of work currently done by the Central Admin. could be done more efficiently by the individual campus administrators.

Bill has also recently completed a four-year term as secretary to the Retired Faculty Association.

**Robert Ellingwood** has been a lecturer for the Math Module Program since his retirement.

**Watson Fulks** recently published a new textbook, *Complex Variables: An Introduction*, Marcel Dekker, Inc. (1993). Watson currently resides in Austin, Texas, but usually visits the Boulder campus at least once per year and has taught a summer course during several recent years.

**Burnett C. Meyer** continues to be an active participant in a Math Dept. research seminar and other campus activities. Retirement has given Burnie more time to devote to traveling and to attending Colorado Rockies baseball games.

**Wolfgang J. Thron** in retirement continues to be active in mathematical research, to participate in a departmental research seminar and to serve as a thesis advisor to mathematics doctoral students. He also travels a great deal to visit friends, relatives and mathematicians throughout the world and to explore interesting cultures and art. In September 1995 he spent one week at the University of Trondheim, Norway.

#### STAFF NEWS

**Perle Bochert** joined the Mathematics Department as its Program Assistant in April 1994. Prior to that she was the Editorial Assistant for 17 years in the Department of Psychology for the quarterly journal, *Psychological Review*. Perle is also a mother, a grandmother and a native of Boulder. She has become a valued member of the Mathematics Department team and we hope she will continue to guide our administrative work on a smooth and productive course.

**Carol Deckert** assumed the responsibilities as secretary of our graduate program in the summer of 1994. Carol moved from a cosmopolitan life in New York City to rural Colorado in 1975. She began her career at CU-Boulder in 1986 and has worked in the Bursar's Office, the UCSU, and School of Education. She took a 1-year leave of absence to complete a B.A. in English at UCB in August 1994. Commuting to Boulder from Nederland each day, Carol also wears the hats of wife and mother. She is rapidly getting to know our graduate students and takes pride in helping them surmount the administrative hurdles on campus.

**Barbara Miller**, our previous graduate secretary, moved to Honors in Fall of 1993. We wish you well, Barbara.

**Subha Tallamraju** came to the Mathematics Department in September 1992 as a student assistant and played a valuable role during a time of staff transition in the depart-

ment. Subha graduated in 1994 with a Master's degree in Business Administration and is now pursuing a career in international marketing development and consulting.

#### SOFT BALL TEAM

Graduate student, Dee Dee Shaulis, reported that "This year (1994) we went with the outrageous team name: 'The Math Dept'. Unfortunately the weather put a wrinkle in the season, but we did an outstanding job nonetheless. We finished the pre-season: 1 win, 1 loss, 1 tie. The first game of the tournament we were cheated and suffered a heart-breaking loss. After that the weather turned on us and our careers were cut short. Oh well..." Editor's note: Dee Dee was planning to write a report on the 1995 season, but she was injured. We hope for a speedy recovery and another colorful report (on 1995) in the next issue of Prime Bits.

#### GRADUATE DEGREES AWARDED

The following students received graduate degrees in mathematics between December 1992 and August 1995. They are listed below by: NAME; degree (faculty advisor) and employment positions if known.

##### December 1992

**Jeff DAVINE**, M.A. (K.E. Gustafson); industry.

**Bernard GILLETT**, M.A. (W.F. Taylor); working for the University Learning Center (CU).

**Jeremy HARLOS**, M.A. (L.W. Baggett); musician.

**Julie PRIBNOW**, M.S. (R.K. Goodrich).

**John COLEMAN**, Ph.D. (W.F. Taylor); faculty position at East Central Oklahoma Univ.

**Husain Ali OJAN**, Ph.D. in Appl. Math. (K.E. Gustafson).

**Chang SHIN**, Ph.D. (A. Bressan).

### May 1993

**Elizabeth BATCHO**, M.A. (D. Grant); teaching.

**Charles KING**, M.A. (L.W. Baggett); further education.

**Andrew MAI**, M.A. (A.T. Lundell); government laboratory.

**Jennifer TAGGART**, M.A. (E. Stade); Ph.D. program at CU-Boulder.

**James D'AMBROSIA**, Ph.D. (R. Holley); Storage Technology, Inc., Louisville, CO.

### August 1993

**Susan DETTLING**, M.A. (R.K. Goodrich); Ph.D. program at CU-Boulder.

**Joann LAPIERRE**, M.S. (R.K. Goodrich); industry.

**Barbara LONG**, M.A. (J. Mycielski); further education.

**John McARTHUR**, M.A. (K.E. Gustafson); further education.

**Glenn DEAN**, Ph.D. (W.N. Reinhardt).

**Karla OTY**, Ph.D. (A.B. Ramsay); Asst. Professor at Southeastern Oklahoma State.

**Paul VOUTIER**, Ph.D. (W.M. Schmidt); Post Doctoral position at the University of Paris IV.

### December 1993

**Stacey GLAZER**, M.A. (D. Grant); industry.

**Fabio ANCONA**, Ph.D. (H.G. Hermes); SISA, Trieste, Italy.

**Regina ARAGON**, Ph.D. (J.D. Monk); Eastern New Mexico University.

### May 1994

**Sarada GANTI**, M.A. (R.K. Goodrich).

**James MARKS**, M.A. (R.K. Goodrich).

**Robert MATNSCHELS**, M.A. (D. Grant).

**Arianne NOH**, M.A. (R. Roth).

**Nicholas SANER**, M.A. (W.B. Jones).

**Mark WILLIS**, Ph.D. (L.W. Baggett).

### August 1994

**Thomas HUNTLEY**, M.A. (K. Goodrich).

**Vivian KENNEDY**, M.A. (G. Yu); further education at C.U.

**Alison MARBLE**, M.A. (C. Farsi); further education at C.U.

**Karin REISBECK**, M.A. (L. Baggett)

**Tracy RYAN**, M.A. (E. Stade); Actuarial Assoc., Liberty Mutual Ins., Boston, MA.

**Catherine M. BONAN-HAMADA**, Ph.D. (W.B. Jones); Asst. Professor, Western Oregon State College.

**David LARUE**, Ph.D. (R. Laver).

**John McARTHUR**, Ph.D. (K.E. Gustafson); teaching.

### December 1994

**Faan Tone LIU**, Ph.D. (R. Holley); faculty position at Williams College.

### May 1995

**Alice BABBITT**, M.A. (R. Laver).

**Robert CHIARAMONTE**, M.A. (A.B. Ramsay); Ph.D. program at CU-Boulder.

**Beth CHORBAJIAN**, M.A. (R.K. Goodrich).

**Elisabeth GREENHALGH**, M.A. (R. Holley); facilitator for the Colorado State Systemic Initiative, Fiske Planetarium, Boulder Campus.

**Jack HAN**, M.A. (R. Holley).

**Michael KEATING**, M.A. (W. Taylor).

**Eric KIHN**, M.A. (D.P. Sather); NOAA (National Oceanographic and Atmospheric Admin., Boulder Laboratories).

**Jane ARLEDGE**, Ph.D. (D. Grant); teaching in Newcastle, Australia.

### August 1995

**Michael SILBERGLITT**, M.A. (R. Tubbs).

**Cathleen M. CRAVIOTTO**, Ph.D. (W.B. Jones); Asst. Professor at the University of Northern Colorado.

**Xia GAO**, Ph.D. (W.M. Schmidt).

**Dean MOORE**, Ph.D. (J. Fox); teaching.

**Simon WONG**, Ph.D. (P.D.T.A. Elliott); Asst. Professor at Eastern New Mexico University.

*Corrections to Graduate Degrees in Spring 1992 Prime Bits:*

**Brian MAHONEY**, M.A. May 1991 (K.E. Gustafson).

**Robert WALSH**, M.A. May 1991 (K.E. Gustafson); Consultant for the U.S. Army.

ALUMNAE/ALUMNI NEWS

The following items were received in response to the last issue of **Prime Bits**. We appreciate your sending us news about yourself and your family (personal or professional) because your former classmates and faculty enjoy reading about you. We would also like to receive reminiscences of what CU-Boulder was like in earlier years from those of you who were here then. It is good to preserve for future generations the memories of the university that some of you have.

**Ellen E. Reed** (M.A. 1964, Ph.D. 1966, Major Professor Wolfgang Thron) is teaching mathematics and science at a small, private liberal arts school (Trinity School) in South Bend, Indiana. She wrote: "The intellectual atmosphere is very stimulating. During the past two years I have taught calculus, chemistry, genetics, mathematical structures, and calculus-based physics. Currently there are two of us who are slowly working our way through quantum mechanics. I have also managed to find some time to study extensions of convergence spaces and am currently interested in quasi-uniformities." Ms. Reed resides at 1127 N St. Peter, South Bend, IN 46617-1349.

**Timothy Binkley** (B.A. 1965, M.A. 1966) earned a Ph.D. in Philosophy from the University of Texas in 1970 and was a Post-Doctoral Fellow during 1979-82 at the Courant Institute of New York University doing graduate work in computer science. Dr. Binkley is presently the Chair of the MFA Program in Computer Art, and Director of the Institute for Computers in the Arts at the School of Visual Arts, New York, NY.

He is the author of numerous books, articles and software and his current research interests include Telecommunications and Interactive Art, Software for Artists, the Cultural Impact of Technology and Philosophical Aesthetics. Dr. Binkley resides at Apt. V-17-B, One Irving Place, New York, NY 10003.

**James P. Burling** (Ph.D. 1965, Major Professor Aboulghassam Zirakzadah) is a Professor of Mathematics at the SUNY (State University of New York) at Oswego. Prof. Burling is considering retirement in the near future. James would like to hear from *Vic Keiser* and *Bill Ramaley*. Please contact him at the Dept. of Math, SUNY at Oswego, Oswego, NY 13162 if you have any knowledge of them. They were classmates at CU-Boulder but have lost touch. Thanks!

**Jo Ann Joselyn**, Ph.D. (B.S. Applied Math 1968), is Chief of the Geospace Branch, Research and Development Division, National Oceanic and Atmospheric Admin., Space Environment Laboratory, 325 Broadway, Boulder, CO 80303.

**George F. Estabrook** (A.M. 1969, Major Professor Stanislaw Ulam) is Professor of Botany at the University of Michigan, Ann Arbor, MI 48109-1048. Working in the U. M. Herbarium, Professor Estabrook applies combinatorix and probability to the study of natural history. He gave an intensive workshop on this subject to about 50 professionals at Madrid, Spain in July 1993.

**Sarah Walker** (B.A. 1969). Mrs. Sarah Walker Simonic received an MBA from National University, San Diego and has had a long career selling computer products. After graduation she worked for Control Data Corp., then Digital Equipment Corp. and now at a smaller company, SIMPACT, in San Diego. She has been the U.S. Director for Sales for 3 years, then International Sales Director for wide area communication products, and now she is selling voice annotation products for PCS. Mrs. Simonic presently resides

at 3741 Notre Dame Ave., San Diego, CA 92122.

**Edward J. Gerety** (M.A. 1973) received a B.S. from the University of New Mexico in 1973 and an MBA from the same university in 1993. Mr. Gerety resides at 17416 Moody Dr., Modjeska, CA 92676.

**Morris B. Hoffman** (B.A. 1974 and J.D. 1977) is a District Court Judge in Denver, Colorado. Judge Hoffman resides at 700 Oneida, Denver, CO 80220-5527.

**Laura L. Langer** (B.A. 1975, M.A. 1977) received an M.S. in Petroleum Engineering from Stanford University in 1979 and an M.A. in Secondary Education from Duquesne University in 1986. She is presently Vice President for Reservoir Engineering at EQUITRANS, Inc. at Pittsburgh, PA 15275. Mrs. Langer resides at 7440 Trevanion Ave., Pittsburgh, PA 15218-1245.

**Mark L. Burns** (B.A. 1978) is currently a member of the Technical Staff (MTS) at AT&T Bell Laboratories, Denver, CO. Mr. Burns resides at 4866 Tanglewood Ct., Boulder, CO 80301.

**Brent P. Jenkins** (B.A. 1983) received an M.A. in National Security Affairs at the Naval Post Graduate School, is presently a Reactor Training Assistant on the USS Abraham Lincoln (CVN 72) at Alameda, CA, and was recently promoted to Lieutenant Commander. His current mailing address is: RT Division, USS Lincoln (CVN 72), FPO AP 96612-2872.

**Stephen C. Wehrend** (B.A. Math 1984 and M.S. Computer Science 1990) is currently a Ph.D. student in Computer Science at CU-Boulder. He resides at 1350 20th St., #K12, Boulder, CO 80302.

**Billy F. Reynolds, Jr.** (B.A. 1985, Major Professor B. Meyer) is a senior software engineer at Dynamic Information Systems Corp. (DISC), Boulder, CO. He resides at 4920 Yates Court, Broomfield, CO 80020.

**Bruce Wagner** (B.A. 1986) received an M.S. in Mathematics from California State University in 1992. He teaches mathematics at Bell High School in the Los Angeles Unified School District, was married to Sylvia Wagner in June 1992 and they presently reside at (new address) 3755 Forest Ave., Yorba Linda, CA 92686.

**Deanna M. Caveny** (Ph.D. 1991, Major Professor Robert Tubbs) is a member of the Mathematics Department faculty at the College of Charleston and at the University of Charleston, Charleston, SC. She took a leave of absence in spring 1993 for a Post-Doctoral position at the Mathematical Research Institute (MSRI) at Berkeley, CA and from June 1993 to July 1994 as a Research Fellow in Mathematics at Macquarie University, Sydney, Australia.

**Bonnie Shulman** (Ph.D. Math. Physics 1991, Major Professors Ellen G. Zweibel and Karl E. Gustafson) is an Asst. Professor of Mathematics at Bates College. She writes: "Made it through 2 tough Maine winters. Love teaching at this small liberal arts college. Still don't ski!" Bonnie's address is 204 College St., Lewiston, ME 04240.

#### ALUMNI AND STAFF LOSSES

**Joann Humphrey Marx**, the Staff Assistant for the Mathematics Department from summer 1992 until spring 1993, died on March 15, 1993. Joann Marx brought a great deal of talent and dedication to our department and she is greatly missed by many of our faculty, staff and students.

**Harvey C. McKenzie** (Ph.D. 1956, advisor, Albert Edrei) died at age 85 on May 6, 1995. He received B.A. and M.A. degrees at the University of Wisconsin at Madison and subsequently taught mathematics at Western State College in Gunnison, Colorado. After completing the Ph.D., he taught mathematics at South Dakota State, Northern Illinois University at Dekalb and then at the University of Wisconsin at Oshkosh until he retired in 1982.

## KEMPNER COLLOQUIUM ENDOWMENT

Earlier this year the Mathematics Department drew up an agreement with the CU Foundation to establish a \$50,000 endowment for the department's weekly, public colloquium series. The distributable income from the Endowment will pay travel expenses and small honoraria for colloquium speakers who are *not* on the faculty of the CU-Boulder Mathematics Dept. Mathematical lectures on topics of broad interest help to maintain a vibrant learning environment for both faculty and students.

The Kempner Colloquium was initiated in 1963 in honor of Aubrey J. Kempner who came to the University in 1925 as Head of the Mathematics Department, and remained in that position until retirement in 1949. Professor Kempner gave the inaugural lecture for the colloquium series and continued to take an active interest in the Department until his death in 1973. The idea of naming the colloquium for Kempner came from three members of the faculty in 1963: Professors Arne Magnus, Robert McKelvey and Burnett Meyer.

Raising \$50,000 to endow the Kempner Colloquium is a significant challenge. We believe that it can be achieved within 5 years (i.e., by the year 2000) by gifts from the faculty, alumni, and friends of the CU-Boulder Mathematics Department. Members of the faculty (both active and retired) have already made cash gifts and pledges in the amount of \$3500. Our goal as faculty is to contribute \$25,000 to the endowment by the year 2000. *We hope that CU alums will help us in meeting this challenge by sending tax deductible gifts to the CU Foundation for the Kempner Mathematics Colloquium Endowment Fund.* (see enclosed form for Math Dept. 1995 Annual Fund). The Kempner Colloquium Endowment project gives each of us an opportunity to make a lasting contribution toward the teaching and learning of mathematics at CU-Boulder. Your help can make a difference. Please join us in establishing this endowment for the University of Colorado.



Professors Aubrey Kempner and Burton W. Jones in Kempner's house, 1952.

## MATHEMATICS DEPARTMENT 1995 ANNUAL FUND

We invite you to designate your 1995 CU Annual Fund gift to the Mathematics Department, University of Colorado, **Boulder**. To ensure accurate processing of your gift, please complete this form and mail it along with your tax deductible contribution to the **University of Colorado Foundation, Arts and Sciences Development, Campus Box 462, Boulder, CO 80309-0462**.

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Enclosed is my tax deductible check payable to the "CU Foundation" for \$ \_\_\_\_\_.  
I work for a matching gift corporation and am enclosing the corporate matching gift form.  
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I wish to designate that my contribution be used for:

*Amount:*

- (a) \$5 to defray cost of printing and mailing the newsletter (Prime Bits)\*
- (b) Kempner Colloquium Endowment\*\*
- (c) Burton W. Jones Teaching Excellence Award Endowment\*\*\*
- (d) Scholarships
- (e) Math Dept. General Fund

**\*EDITOR'S NOTE: If you wish to continue receiving the Mathematics Department Newsletter (Prime Bits), please check item (a) above and send this page with a \$5.00 check for that purpose to the CU Foundation (address given above). The Department now has no other source of funds that can be used for the printing and mailing.**

\*\*See description of the *Kempner Colloquium Endowment* preceding this page.

\*\*\*See the discussion of the Burton W. Jones Teaching Excellence Award earlier in this issue of Prime Bits.



**ATTENTION ALUMNI:**

Please return this form to the address below if you have moved or if you have news to share. We are interested in what you have been doing since graduating from the University of Colorado. We will publish this information in subsequent newsletters.

Newsletter Editor  
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Campus Box 395  
University of Colorado  
Boulder, CO 80309-0395

NAME \_\_\_\_\_

CU degree(s) and date(s) \_\_\_\_\_

Major Professor \_\_\_\_\_

Degree(s) from other schools \_\_\_\_\_

Present position, employer, location \_\_\_\_\_

Awards, honors, fellowships \_\_\_\_\_

Current mailing address \_\_\_\_\_

Other news of interest \_\_\_\_\_

Reminiscences of CU-Boulder \_\_\_\_\_



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