AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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IN THIS ISSUE

PRESIDENT'S REPORT

Orono Report

Circumstances limited me to one day of the Orono meeting, with Jill propping me up, but it was an exciting and full day, highlighted by the careers panel which Jenny Baglivo describes elsewhere in this issue and by the presentation of the second Alice T. Schafer prizes. Again let me say that it is a real treat to meet the Schafer prize-winners and that it is most generous of their home institutions to make it possible for them to attend.

Some of this year's and last year's women have formed a young women's (as opposed to old girls') network, via e-mail of course; smbelcas@math.lsa.umich.edu is tracking everyone down, and would appreciate addresses, I believe.

Our "Careers That Count" booklet was newly and freely available at Orono and is now selling like *Scarlett* (well... maybe not, but the quality-to-price ratio is infinitely higher, and the orders are flowing in). If funding becomes available, we hope to distribute it even more widely soon.

The Buck Stops Here

Money is on a lot of minds these days, I fear, including mine, especially since Donna Beers has withdrawn as candidate for Treasurer, and so my signature is the one available to pay the bills. I hope that the nominating committee will have selected a replacement soon!!! Speaking of money, thanks to Exxon again for an additional $5000 for operating expenses, coming at a timely moment when we had exhausted Exxon resource funds and some of our own in the final push for the booklet. At Orono, the Executive Committee voted that the generous gift from Ethel Ward McLemore be distributed between the Schafer Prize and the SKHS Days support funds. The latter should allow us to provide partial funding for three such days.

AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

The Association was founded in 1971 in Boston, MA. The purpose of the association is to encourage women to study and to have active careers in the mathematical sciences. Equal opportunity and the equal treatment of women in the mathematical sciences are promoted.
The *Newsletter* is published bi-monthly.
The Editor welcomes articles, letters, and announcements.
Circulation: 4,000.

Baltimore???

My previous President's report had ICIAM misplaced — it took place in Washington, D.C., in fact, and *SIAMNews* of September 1991 has coverage of the workshop on page 14, including a photo taken at the dinner.

Baltimore!!!

We really *do* meet in Baltimore in January 1992. Cora Sadosky will serve as chair for the Workshop taking place Tuesday, January 7th. The registration form for the meeting mentions an AWM banquet; in fact, this dinner is Tuesday, at the close of the workshop day. Please come early enough to attend Tuesday's activities! On Wednesday we have a panel on Graduate Education at 3:20 P.M., followed by our business meeting at 4:20 P.M., where the Louise Hay prize will be announced and also a surprise presentation will be made. Wednesday night is the AWM party, 9:30-11:00 P.M., always the social highlight of the joint meetings. Don't forget that your non-dancing prez (and now holder of the purse strings) will have to be persuaded or bribed into having music there! Nancy Koppel will give the Noether Lecture, entitled "Oscillators and networks of them: which difference makes a difference?" at 9 A.M. on Thursday morning. Members may sign up at the meeting to attend a dinner Wednesday evening in Nancy's honor.

Behind On My Correspondence

I am grateful to those of you who wrote to me. I've heard from members on a range of topics, ones to which you've given careful thought and on which you help me when I'm asked to speak for more than myself. I'd like to reproduce bits of your letters (or all of them) in later reports, but won't do so without explicit permission.

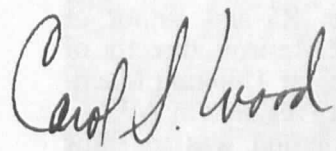
An important thread which is repeated in many letters is the social climate in undergraduate and graduate schools and the ways in which women, and some men, are made to feel they are outsiders. There is a lot of work to do, the battle scars are many, and there is much resentment of the energy and attention expended on such unnecessary frustrations. It should not be PC to make the ridiculous remarks we often tolerate from our socially retarded colleagues! And some of you have written this to me with much greater eloquence than I possess. On the upbeat side, I'd like to quote a student writing about the climate in her graduate setting, in which the students work cooperatively and "for all the 'math-macho' dork faculty members who try to make things all scary, there seem to be some more than willing to laugh at it all with you."

Stranger Than Fiction

For something totally bizarre, consider the following: a French colleague publishes a paperback book on his own, a book which includes a treatment of some good work. He declares that to make it more "attractive," he has incorporated professional photos of women, nude, almost surely reproduced without permission. His previous behavior on a range of matters makes this latest not the total surprise it might be! In the index, there are certain women's names, appearing with mathematical references, but also referenced to the photos of other women. Indeed, your name is there — misspelled, which is a small comfort somehow. Your graduate student, also a woman, could learn something from the mathematics in the book. You believe that the best reaction is no reaction, at least in terms of adding to the mischief done. But no reaction may imply unintended approval. Your male colleagues find the whole matter entertaining at worst, and one selects the book as a text for a graduate course (at a famous Catholic university). No one seems to mind that either.

You resign yourself to the book's being distributed only among those who are interested in the mathematics and who may be told that the author's calling is more provocation than misogyny. The student who is given a copy laughs at the folly of the author. (Maybe the next generation is more savvy?) But that's not the end of it. The book appears in a big university library, and your worst fear comes true: someone who knows neither the author nor the subject comes across it and is offended. She brings it to the attention of the departmental library committee, who decide to keep the book.

The story is true. People whose judgment I respect disagree vehemently on whether the book should be available. And I'm no wiser than when the story began. What now?



Carol Wood
Middletown, Connecticut
Oct. 4, 1991

HONORS AND AWARDS

Congratulations to the women listed below for their meritorious achievements.

The National Medal of Technology was awarded by President Bush to, among others, Admiral Grace Murray Hopper, US Navy, retired.

Ewa Ligocka and Steve Bell were recently named as the second awardees of the Stefan Bergman Trust. The following information is from the AMS *Notices*, Sept. 91, pp. 792-793:

> Ewa Ligocka was born October 13, 1947 in Katowice, Poland. In 1970, she earned her M.S. in mathematics from Warsaw University and took a position there. She studied analytic functions with W. Zelasko and with J. Siciak during a stay in Cracow in 1971. She earned her doctorate in 1973, under the supervision of W. Zelazko. Her thesis and first three papers were in the area of analytic functions on topological vector spaces.
>
> She worked at Warsaw University until 1977, when she lost her position for political reasons. In 1976, she began working with M. Skwarezyniski, who gave her the inspiration to study the Bergman kernel and related topics. Her work on Fefferman's theorem, which she began in 1978, led to the joint paper with Steve Bell, for which the two received the Bergman Prize. Later, she wrote a series of papers devoted to Sobolev-Besov spaces of holomorphic and harmonic functions. Since 1979, she has held the position of docent at the Institute of Mathematics at the Polish Academy of Sciences.

CAREERS THAT COUNT: OPPORTUNITIES IN THE MATHEMATICAL SCIENCES

On Thursday, August 8, 1991, AWM sponsored a panel discussion on careers at the Orono Mathfest; MAA was a co-sponsor. AWM also proudly introduced our new publication "Careers that Count: Opportunities in the Mathematical Sciences."

The panelists were: Sharon Chapman, teacher at Amherst Junior High School, Amherst, MA and past President of the Association of Teachers of Mathematics in Western Massachusetts; Jacquie Callahan, member of the technical staff at the Jet Propulsion Laboratories, Pasadena, CA; Allyn Jackson, staff writer for the American Mathematical Society, Providence, RI and author of "Careers that Count;" and Jill Mesirov, director of mathematical sciences research at Thinking Machines, Cambridge, MA and past President of AWM.

The objective of the discussion was to show the range of opportunities available to those with training in the mathematical sciences. Each woman spoke about her career. The remarks were interesting, humorous and inspiring. The panel discussion was very well attended — partly because science writer Barry Cipra told all who attended the opening banquet to come — and very well received.

I would like to take this opportunity to thank all those who took part in the production of our brochure "Careers that Count," especially: Tricia Cross, project coordinator; Allyn Jackson, writer; and Lisa Gallo, designer. The brochure contains profiles of sixteen women (including Sharon Chapman and Jacquie Callahan). Copies are available through the AWM office. Be sure to get one!

We gratefully acknowledge the support of the Exxon Education Foundation. Exxon funded the development of "Careers that Count" and "Profiles of Women in Mathematics: the Emmy Noether Lecturers" and provided support to upgrade our operations at the AWM office.

Jenny Baglivo, Boston College

Single copies of the booklet are $1.50; multiple copies (10 or more) are $1 each.

Allyn Jackson, Jacquie Callahan, Jenny Baglivo, Sharon Chapman, Jill Mesirov

CONFERENCE IN HONOR OF MARY ELLEN RUDIN

At the end of June, 1991, a conference was held in Mary Ellen Rudin's honor in Madison, Wisconsin, on the occasion of her retirement from teaching (but not from mathematics!). A similar conference had been held earlier in the month to honor her husband, Walter Rudin.

Mary Ellen's conference was mathematically quite rich. Eight survey talks were given on mathematics she has strongly influenced, and there was a large number of non-survey talks, including presentations of some strikingly beautiful new results. Most of the speakers had either worked closely at some point with Mary Ellen or were students of people who had. The atmosphere, as one would expect, was encouraging and mathematically vital. Special effort was made to encourage graduate students to come, including graduate student stipends thanks to NSF funding, and there were many graduate students, young post-doctoral mathematicians, and women, including two of the invited speakers. The conference was also graced by the strong and vibrant presence of the Russian mathematician Boris Sapirovski, a remarkable man who died a few months later of cancer and who will be greatly missed. The two major organizers of the conference were Frank Tall and Ralph Kopperman, who did a splendid job. The conference proceedings will be published in two volumes by the New York Academy of Sciences.

AWM honored Mary Ellen at a party. The citation which follows was delivered on our behalf by Judy Roitman.

I have been asked to express to Mary Ellen Rudin the appreciation, affection, and congratulations of AWM, and it is an honor to do so. Carol Wood, the President of AWM, has sent a message which I would like to read you:

> AWM sends best wishes to Mary Ellen on this occasion in which her mathematical contributions are being honored. We add our special acknowledgement and appreciation of what she has meant to women mathematicians over the years — both in the ways she has encouraged and supported young women (and men), and also more broadly by her example of a highly productive career, in which her fine enthusiasm for mathematics and her buoyant spirit heartened us all.
>
> On a personal note, I found it a double whammy when I entered graduate school to be a woman *and* a Southerner; that Mary Ellen could carry off both with such aplomb was encouraging, if humbling, to me!

Now I would like to say a few personal words about Mary Ellen. I am lucky to be of those generations of topologists nurtured by Mary Ellen's mathematical vision and personal warmth. Her mathematical vision has been spoken of at length at this conference. So I would like to speak a little about her personal side. I met Mary Ellen over the phone, when I arrived in Madison as a visiting graduate student nearly 20 years ago, along with Bill Fleissner and Aki Kanamori. Mary Ellen's father had just died, and I caught her getting ready to go to his funeral. I think many of us, at a time like that, faced with a call from an unknown graduate student, would understandably get off the phone as quickly as possible; but Mary Ellen made sure that I was all right — did I have an apartment? an office? — she may even have checked to see if I had library privileges! — and apologized profusely for being unable to meet me until she got back. Needless to say, this was not what I was used to at Berkeley.

The next story comes later, at the International Congress of Mathematicians in Vancouver, when I was a freshly minted Ph.D. and extremely active in AWM activities. Mary Ellen did not approve. One morning as we ate breakfast together I tried to convince her of the importance of improving the situation for women in mathematics. "*The best way to help women in mathematics is to do mathematics!*" she roared, pounding her fist on the table so hard that the dishes jumped in the air.

When my first baby died of meningitis, it was Mary Ellen who wrote the letter I came closest to memorizing, about how it was when her son Bobby was born with Down's syndrome, and the terrible things the doctors had told her about his future. "Your life will never quite be the same again," she wrote, and there was more comfort in the acknowledgement of that reality than in all the voices trying to convince me that, indeed, life would go on as before.

Mary Ellen and Walter have, on their kitchen counter, an old AM radio that is probably as old as their marriage, maybe older. I asked Mary Ellen once why she never got a newer, better model, and she responded "because it still works." This radio is, to me, the material symbol of the basic, decent values that Mary Ellen and Walter have exemplified in their lives, without distraction, and from which we all continue to learn.

And so I would like to present to you, Mary Ellen, this material symbol [AWM mug] of appreciation from the Association for Women in Mathematics.

Judy Roitman
University of Kansas

AWM ELECTION

The ballot may be found on page 28.

Statement, Cora Sadosky, candidate for President-Elect, Howard University

In the twenty years of existence of the AWM the situation of women in mathematics in the US has radically changed for the better. Our association has played a leadership role in this change, and this should be continued.

Yet more needs to be done. We still live in a society that "seriously" debates the worth of the results of Sonja Kowalewski, while justifying the absence of women full professors in the top math departments of the country arguing that there are almost no women with good enough credentials. The fact is that women, in our profession as elsewhere, need to achieve much more than men to be considered their equal. Meanwhile, the female talent has real trouble to be recognized, mostly in the early stages. It is there, where the problem starts, that it has to be solved.

Women graduate students still have serious problems to be accepted on equal footing in most graduate programs that train mathematical researchers. Young women are still often discouraged to pursue their Ph.D.'s, either because they are "not good enough" or because mathematics is a deadend career that precludes "normal (family) life."

Until such problems are solved, it will be impossible to flood the research centers with the hundreds of potentially excellent young women mathematicians, among whom will emerge the brilliant full professors that are in such demand.

The AWM Workshops for Graduate Students and Postdocs is a wonderful initiative and a first step in the right direction. Much needs to be done in each department to support women students, as well as to identify potential math students in high school.

We all know about the many problems facing young female math professors before tenure consideration (most of whom are married to young male math professors — but not vice-versa). Much has to be learned about their rhythms of mathematical production, and much has to be acknowledged about the material conditions affecting productivity of women mathematicians. It is at this level that support is critical. The AWM travel grants program is a good step, as are some of the initiatives of the NSF.

Measures must also be taken to protect the people in midcareer, when they may be finally and forever sidetracked into deadend positions. More opportunities as the NSF Career Awards and the Visiting Professorships for Women in Science and Technology have to be implemented.

During the last couple of years women mathematicians have been the recipients of important distinctions and prizes. Still much has to be achieved before due recognition is given regardless of gender or other extraneous considerations.

I intend to develop further the excellent initiatives of the AWM, and to help devise new ones, working with the wonderful group of women that make these initiatives into realities. I hope to reach to all mathematicians, women and men alike, who share our conviction that the hour has come for women to fully enjoy their right to mathematics.

Statement, Mei-Chi Shaw, candidate for Member-at-Large, Notre Dame

It is my belief that women mathematicians can be best served by organizing among themselves to provide the proper networking and mutual support. In this respect an active researcher from a different

background can offer some new experience and perspective to AWM.

Proposed By-laws Changes

The amendments below were approved by the Executive Committee for action at the August 8, 1991 Executive Meeting in Orono, Maine. New text is underlined; old text is struck over.

2.6 Regular Meetings.

Regular meetings of the members may be held at such places within the United States and at such times as the members may determine. Two regular meetings of the Corporation ~~shall~~ may be held in conjunction with the annual and summer meetings of the American Mathematical Society and the Mathematical Association of America. The presence of twenty members in good standing shall be necessary to constitute a quorum.

4.2 Number and Election or Appointment of Officers.

The Officers shall consist of the Executive Committee. The Executive Committee shall consist of the President, President-Elect (in even years) or Past President (in odd years), Treasurer, Newsletter Editor, Clerk, Meetings Coordinator, and five At-Large Members. The Officers shall be elected or appointed as follows:

In the fall of years ~~1981+4n~~ 1993+4n, elections will be held by mail ballot of the general membership for the President-Elect and three At-Large Members; the President shall appoint a Clerk, and the Executive Committee shall appoint a Newsletter Editor and a Meetings Coordinator. In the fall of years ~~1983+4n~~ 1991+4n, elections will be held by mail ballot of the general membership for the President-Elect, Treasurer, and two At-Large Members; the President shall appoint a Clerk and the Executive Committee shall appoint a Newsletter Editor and a Meetings Coordinator. The Directors shall automatically appoint the President-Elect to be President immediately following her term of office, and the President to be Past President for the year immediately following her term of office.

4.3 Tenure.

The President~~,~~ shall hold office for two years commencing with the odd year February 1 immediately following her appointment. ~~t~~The Clerk, the Meetings Coordinator, and the Newsletter Editor shall hold office for two years commencing with the ~~January 1~~ even year February 1 immediately following their appointments. The President-Elect shall hold office for one year commencing with the ~~January 1~~ even year February 1 immediately following her election, and the Past President shall hold office for one year commencing with the ~~January 1~~ odd year February 1 immediately following her appointment. At-Large Members and the Treasurer shall hold office for four years commencing with the ~~January 1~~ even year February 1 immediately following their election. Each officer shall hold office for the above terms and until her successor is elected and qualified, or until she sooner dies, resigns, is removed, or becomes disqualified. The President, Treasurer, and At-Large Members are not to hold the same office for more than two consecutive terms.

EDITORIAL EMAIL ADDRESS CHANGE

Loyola's Internet connection is now fully functional, so I have a new address. The cantor!etc. address is not to be counted upon (it is currently working, but recently borel had a hard disk crash, cantor then had a bad day, and gargoyle is probably going to stop talking to cantor, not to mention that cantor will disappear from the departmental network at some future date). The LMA24 address is still fine, but my logonid may change on that machine at some unspecified time.

new address: aleggett@lucpul.it.luc.edu

EDUCATION COMMITTEE

Rhode Island, through funding by the Rhode Island Department of Elementary and Secondary Education, Division of Vocational and Adult Education and other sources continues to support a variety of projects which encourage females to pursue mathematically related careers. Although many of the projects described below are new, the project New Careers for Women is in its tenth year, and projects WATS and SPHERE are now entering their seventh years.

Sonya Kovalevsky Mathematics Day

On Wednesday, May, 1990, from 8:30 A.M. - 12 noon, one hundred female junior and senior high school students from Rhode Island participated in a Sonya Kovalevsky Mathematics Day. The keynote speaker, Ms. Cheryl Watkins, a black engineer who is executive vice-president of Peerless Precision, Inc. discussed how she overcame obstacles and discouragement from people such as her high school guidance counselor and former employer to gain an undergraduate degree in Mechanical Engineering and an MBA and to attain her current job. Students then saw and discussed the video "Making Points," which showed males speaking the answers that females had given to career goals. Students also participated in math/career activities, including playing "Odds on You" (available from Equals), the purpose of which was to emphasize the need to continue studying math and technical subjects.

To encourage more girls to consider math and science-related careers, students met in small groups with women representing trade, technical and professional careers: Meg McKenna, electrician and instructor, New England School of Technology; Elaine Godfrey, vice-president, Rockville Stone Mill; Cathy Bonang, plumber, JB Plumbing; Pat Tod, director of employee relations, Dechnatel; Elaine Gonsalves, assistant field engineer, Narragansett Electric; Helen Waterman, tool engineer, Stanley-Bostitich; Ingrid Evans, stockbroker, Coastway Credit Union; Dr. Julie Peltò, veterinarian, Roger Williams Park Zoo; and Dr. Sally Zierler, epidemiologist, Brown University.

Many students who wanted to participate were turned away because a limit of 100 was set. This underscores the need for another and bigger Sonya Kovalevsky day. The AAUW together with the Advisory Commission on Women is planning a Math/Science Day to be held during the spring of 1992. The purpose of the day will be to provide information on math and science careers through female role models and some exciting workshops in mathematics and science.

Workshops on Overcoming Math Anxiety

Gert Toher, faculty member at Rhode Island College, presented a FAMILY MATH workshop to parents, students and teachers of Eldredge Elementary School in East Greenwich, RI. The workshop was part of the 1989-1990 PACE (Positive Attitudes — Career Education) program, whose goal was to "teach critical thinking and problem solving skills, and to make math more enjoyable to students so that they will be more apt to choose math-related careers later on." [Equity in Career Options and Education (ECOE) *Newsletter*, Vol. 4, No. 2, February 1990, p.1]

Amy Archer, a math consultant specializing in issues of women and math anxiety, has led workshops for clients of WINNERS (Women in Nontraditional Employment Realizing Success) and project SPHERE (Single Parents & Homemakers Entering Retraining & Education). Ms. Archer, a nontraditional worker and student, tries to help women overcome their fear of math so that they can be prepared for nontraditional jobs which require math skills.

WATS (Women Acquiring Technical Skills)

The goal of WATS is to build confidence and technical skills in females 12 years or older. Students receive twelve weeks of instruction in technical skills, drafting, mathematics and CAD (Computer Aided Design) systems on IBM PC's. They also make an on-site visit to the Community College of Rhode Island's two-year New Careers for Women program. The most promising students are selected to participate in an eight week training program in computer-aided drafting, which is held on-site at Raytheon in Portsmouth, RI. According to Bill McCann, director of the WATS program, about 20-24 females participate in each of the two instructional sessions; some students go on to earn an associate's degree at the Community College of

Rhode Island, while others use their skills to obtain a technical job.

New Careers for Women

New Careers for Women, directed by Roxanne Gomes-Beatty, is a two-year program of job training in technical skills at the Community College of Rhode Island. The program provides outreach recruitment as well as retention support services.

Women in Mathematics and Science: Pipeline to the 21st Century Conference and Dinner

The American Association of University Women, the Association for Women in Mathematics, and the Society of Women Engineers co-sponsored a conference on Women in Mathematics and Science on October 11, 1990 in Providence, RI. The schedule included panels on "Mathematics, Science and Industry: Creating Partnerships for Excellence" and "Bridging the Gender Gap in Mathematics and Science." Dr. Anne Bryant, Executive Director of the AAUW gave an inspiring keynote speech on "Math + Science + Girls = Success." Teachers, students, business leaders, college presidents, and administrators for education were invited to listen and address the problem of providing full participation of women in mathematics and science.

Upcoming Programs for 1991-1992

One of the objectives of the NSF-funded Statewide Systemic Initiative in Mathematics in Science is to "increase the interest of women and minorities in science and mathematics" [RI Statewide Systemic Initiative Program, *Project Summary*, mimeographed, p. 14]. During 1991-1992, the project plans to form a task force on women which will award up to five schools a grant of $5000 in each year from 1992-1995.

Two elementary school teachers from Cranston, RI, Louise Giannini and Sandra Moyer, recently received funding for MS. I. CAN (Math Science Investigations and Career Awareness Network). They plan to involve elementary school students along with their parents in a variety of math and science activities and have classroom visits with women in technical careers along with on-site field trips.

Ann Moskol, Rhode Island College

Chair: Sally I. Lipsey
70 E. 10th Street, #3A, New York, NY 10003

AAUW FELLOWSHIPS

The American Association of University Women (AAUW) awards a variety of fellowships through its Educational Foundation. Master's level students in computer/information science, engineering, or mathematics/statistics may apply for fellowships for their final year of degree study. The application deadline is December 15, 1991. International Fellowships for full-time graduate or post-graduate study or research in the United States are awarded to women of outstanding academic ability who are not citizens or permanent residents of the United States. The deadline is December 1, 1991. Eleanor Roosevelt Teacher Fellowships are awarded to women who teach full time at U.S. public schools in grades K-12 and who have a demonstrated commitment to creating educational equity for girls through work in the classroom, the school district, and the community. The deadline is January 10, 1992. Career Development Grants assist women who are preparing to reenter the work force, change careers, or advance their current careers. Candidates must be in the early stages of their degree programs, hold at least a baccalaureate degree and have earned their last degree on or before June 30, 1987. The deadline is January 2, 1992. Community Action Grants provide seed money to AAUW branches or divisions or individual women for projects or nondegree research that promotes education and equity for women and girls. The deadline is February 1, 1992.

For more details on these programs and for application forms, write: AAUW Educational Foundation, 1111 Sixteenth Street N.W., Washington, DC 20036; 202/728-7603.

BOOK REVIEW

Where Do I Put the Decimal Point? by Elisabeth Ruedy and Sue Nirenberg. Henry Holt & Co., 1990. 227 + x pages, $19.95 hardcover, ISBN 0-8050-1145-5.

This is a really user-friendly book, designed to build the confidence of the mathematically anxious through both psychological and mathematical means. Ruedy, a mathematics teacher and therapist, conducts math-anxiety workshops for adults. Nirenberg is a journalist and, I suspect, is responsible for the light touch and the breezy style.

Right at the beginning, Ruedy describes her methods: "I love teaching math by imagining, drawing, thinking in context, trial and error. In short, I love teaching it away from the dry, left-brain, step-by-step, there-is-only-one-way methodology that scares away the more creative, dreamy child or adult ... " [page 2].

The book is divided into six sections, starting with a discussion of ways to identify one's anxiety by using questionnaires, math autobiographies, and other familiar methods. The second section analyzes some of the myths about mathematical ability, such as "math is a male domain," as well as misunderstandings about how math should be done. Part III deals with confidence-building techniques — tell yourself many times, a day, write on all your memos: "I am brilliant!"

The major part of the book, almost half, is devoted to a discussion of the usual topics in "Easymath," but with emphasis on estimation, mental arithmetic ("a lost art in this country"), visualization techniques, and common-sense methodology. Ruedy feels that schools make math complicated, and she is probably right.

A twenty-page section on everyday-life problems is followed by "afterthoughts," including six tools for lifelong learning. She makes the important distinction between knowing the necessary conditions of the problem and being able to apply math to its solution, a distinction that the mathematically anxious adult tends to confuse when confronted with a real problem.

The approach is positive throughout. Real life anecdotes abound, the author is understanding and supportive of all difficulties, and she assumes in the closing pages that "apprehension... has given way to a new assertiveness.... Along with the assertiveness comes a helpful irreverence toward those numbers that are used to manipulate us: inflated or skewed statistics as they are used in politics and advertising; the various numbers that people use to label us, such as grades, IQ, and medical risk factors."

Claudia Zaslavsky, New York

Book Review Editor: Cathy Kessel
2803 Parker, Apt. 2, Berkeley, CA 94704

JOINT SUMMER RESEARCH CONFERENCES

Suggestions are invited from mathematicians, either singly or in groups, for the 1993 AMS-IMS-SIAM Joint Summer Research Conferences in the Mathematical Sciences. These conferences, jointly sponsored by the AMS, the Institute for Mathematical Statistics, and the Society for Industrial and Applied Mathematics, emulate the scientific structure of those held at Oberwolfach and represent diverse areas of mathematical activity, with emphasis on areas currently especially active. A one-week or two-week conference may be proposed. The deadline for suggestions is February 1, 1992. For more information, see the April *Notices*.

The 1992 Conferences will have the following topics: Conformal field theory, topological field theory, and quantum groups; Cohomology, representations and actions of finite groups; Nielsen theory and dynamical systems; The Penrose transform and analytic cohomology in representation theory; Wavelets and applications; Commutative algebra: Syzygies, multiplicities and birational algebra; Change-point problems; Control and identification of partial differential equations; and Adaptive designs. The conferences will be held at Mount Holyoke College between June 13 and July 24. For more information, see the October AMS *Notices*.

A BRIEF HISTORY OF THE ASSOCIATION FOR WOMEN IN MATHEMATICS: THE PRESIDENTS' PERSPECTIVES

Lenore Blum is a research scientist at the International Computer Science Institute, Berkeley, and Letts-Villard Research Professor at Mills College, Oakland.

Preface

The Association for Women in Mathematics (AWM)[1] held its Twentieth Anniversary Celebration at the Joint Mathematics Meetings in San Francisco, January 16-19, 1991. The festivities included: a Symposium entitled The Future of Women in Mathematics, highlighting ten young women mathematicians (within ten years of Ph.D.) who talked about their current research; a Graduate Student Workshop featuring ten women graduate students who presented their dissertation results; a Workshop Luncheon where dozens more students and AWM members met to discuss "Is there life after graduate school?"; the twelfth annual Noether Lecture (by Alexandra Bellow); the presentation of the first annual Louise Hay Award for contributions to mathematics education (to Shirley M. Frye); and the AWM Anniversary Banquet followed by an Open Party complete with disc jockey and everyone's favorite dancing music.[2]

It was truly a joyous occasion. For those of us who were around during the early years of the AWM, yet still imagine ourselves somewhat youthful, at least in outlook and perspective, any initial disbelief about the prospect of celebrating our twentieth quickly gave way to feelings of deep emotion and pride — pride on having clearly made it in our own way, indeed on our own terms. The numbers of women at the meeting, from old-timers to young faculty and graduate students, and even undergraduates, were staggering. As one woman put it, one did not have to look far to see female faces amongst the sea of faces in every session of the Meetings. Having been on the committees that picked the young women for the Symposium and Graduate Workshop, as well as the Alice T. Schafer Prize committee that awarded the first prizes last summer to two outstanding women undergraduates (Linda Green and Elizabeth Wilmer), I can testify to the elation we felt on seeing the large pool of extremely talented young women mathematicians. Clearly, these awards and invitations are viewed with great respect in the mathematics community, for we witnessed department heads and thesis advisors vying with each other to position their candidates well. Our only dismay was that we could not award all those deserving.

The following article on the history of the AWM is based on an after-dinner talk I gave at the Anniversary Banquet. Shortly after having agreed to give such a talk, it dawned on me that, unlike mathematics — which to some extent one can create in one's head — for history, one needs to have the facts. And, although for a certain period of my life I was intimately associated with the AWM, I certainly did not have total recall nor even near complete knowledge of all that had happened during the past two decades.

So I decided to enlist the help of all AWM Presidents. I wrote each of the other Presidents (Mary Gray, Alice Schafer, Judy Roitman, Bhama Srinivasan, Linda Rothschild, Linda Keen, Rhonda Hughes, Jill Mesirov, Carol Wood) asking "... if you could provide me a brief review of what happened during your term, perhaps discuss its special character... and also comment on questions such as: How you feel AWM has made a difference, areas where we need work, ideas and hopes for the future.... (Any humorous/insightful anecdotes would be welcome.) I would then try to compile and interweave these stories [in my presentation]...."

The history I compiled is in large part a history as seen through the Presidents' eyes, a uniquely personal vision, culled from the many letters and email responses I received. It also comes from the AWM *Newsletters*, *Notices*, my personal files, and correspondence with Judy Green about the origins of the AWM. Her article with Jeanne LaDuke on "Women in American Mathematics: A Century of Contributions" (*WM*) in *A Century of Mathematics in America* (ed. P. Duren, AMS, 1989) as well as the book *More Mathematical People* (*MP*) by Donald Albers, Gerald Alexanderson and Constance Reid (Harcourt, Brace, Jovanovich, 1990) were also helpful. I have also incorporated some of my own memories and experiences, not just as AWM President, but as a woman

mathematician "growing up" during that time. "Brief" in the title is meant as a disclaimer acknowledging my many omissions.

In planning the talk, I decided to quote people directly rather than paraphrase or synthesize. This turned out to be an extremely fortuitous decision for a number of reasons, including the fact that it helped provide the eloquence and humor, in addition to substance, necessary for an ideal after-dinner talk. But even more, by reading the quotes directly, I along with the audience could thoroughly enjoy what everyone had to say. In uncharacteristic fashion, I could even ham it up a bit and add some dramatic effects of my own. Some of the humor was so infectious — we were in stitches — that a couple of times I had a hard time completing a sentence I was reading.

The audience was terrific. It comprised old friends and new. The students and postdocs were there as were very many AWM members whose involvement and support over the years have been so vital to our continuing successes. All AWM Presidents except Judy Roitman (whose semester had begun) and Linda Keen (who was in Helsinki) were present as were Bettye Anne Case (longtime AWM meetings coordinator) and Anne Leggett (longtime AWM *Newsletter* editor), who both earlier in the day had received AWM citations at the Business meeting. There was Marie-Françoise Roy of the European Women in Mathematics, Hope Daly and her Joint Meetings arrangement staff who have worked so closely with us over the years, Debbie Lockhart our program officer at the National Science Foundation (NSF), Mike Dooley of the Exxon Education Foundation, and AWM Executive Director Patricia Cross — the person behind-the-scenes orchestrating this happy event.

Jill Mesirov had suggested that I recognize everyone who had been involved in founding the AWM at the beginning, asking them to rise, and then as I went through the talk, those who joined AWM in five year intervals (Eileen Poiani had done something similar at the MAA's seventy-fifth), and this turned out to be great fun. I think by the end everyone had a chance to stand.

Since I had never given an after-dinner talk before, I was really somewhat apprehensive beforehand. I suspect others felt the same apprehension, for the only public announcement I could find of my talk was in the Banquet menu. At dinner, Mike Dooley who was sitting next to me offered little reassurance when he warned that such talks should never last more than fifteen minutes. So I knew I probably did okay when afterwards Mike said I really could have gone on for another fifteen. I glanced at my watch and much to my surprise I had talked for over forty-five minutes! And then Hope Daly came by to say how she had relived every minute of all the past meetings with me. But most of all, I felt the seal of approval when Judy Green, our consummate historian, came over beaming, gave me a hug and said "You did real good!"

Here is my attempt to recapture the magical spirit of that evening....

PART 1

How it was ...

I would like to begin my talk by recreating some of the atmosphere twenty years ago. So I must start with a warning: the next few minutes [i.e., this section] may be a bit depressing, perhaps even somewhat hard to take. But bear with me, I promise it really will get better.

First, for my journey back in time, I went to the library and checked out *Notices* for 1971. The Joint Mathematics Meetings that year were held in Atlantic City; the program in the January issue was quite revealing. Of the more than fifteen invited hour speakers — AMS, MAA and ASL combined — none was female (i.e., 0%); of the more than 300 AMS ten minute talks, about fifteen were given by women (5%). I became curious and looked at the Personal Items section. This contains short descriptions of individuals' professional activities and achievements as well as job promotions and appointments. Only five of the approximately 145 blurbs seemed to mention women (less than 4%). Of the thirty-one promotions listed, three were female (10%); at the instructorship level, women seemed to do relatively better, getting three of the nine appointments (33%). Here I used the well-known mathematical technique (which has served us so well over the years) of counting and dividing to calculate the telling percentages. And sure enough, as I went down the list — as the positions became less prestigious — the percentage of women increased. As if to confirm this trend even more dramatically, I noticed further on that,

of the four deaths reported in that issue, two were women (50%)!

In the February 1971 issue I found a letter from Elizabeth Berman, pointing out some "advice" on how to find employment, recently published by the Mathematical Sciences Employment Register: "Women find the competitive situation in the government somewhat more advantageous to them, since it is relatively hard to secure a well-qualified mathematician for many higher level government jobs. In many such cases women are welcomed if their qualifications are better than those of the available men." Need I say more?

A gloomy picture of the status of women in academia was painted by Ruth Silverman in a letter that appeared in the June *Notices* that year. I quote excerpts:

> Editor, *Notices*:
>
> As a result of surveys on many campuses it becomes apparent that there is a pattern of discrimination against women in all fields...
>
> 1) Women are predominantly at the bottom of the pyramid, irrespective of qualifications... and suffer a substantial salary inequity. 2) Many academic departments have no full-time female faculty at all. In many... the percentage of female faculty is far below the percentage of females among qualified applicants. 3) In many departments women with Ph.D.s hold positions below the rank of Assistant Professor and are kept at these low ranks without promotion or significant salary increase. 4) Women tend to be hired on a marginal, temporary, or one-year basis.... Often women teaching part-time have the same teaching load as men teaching full-time. 5) There are departments which make it a policy not to appoint women who are married to members of the faculty...

Silverman goes on to recommend that "in the forthcoming annual [AMS] salary survey data be collected... comparing salary levels by sex." This practice was initiated by the AMS some years later.

Now, if you were a female graduate student at the time, there were certain departments where you probably were not. For example, Princeton did not start admitting women to their graduate program in mathematics until the fall of 1968. Marjorie Stein (Princeton Ph.D., 1972) was the first woman to complete her degree requirements there, although a Japanese woman had been admitted some years earlier by mistake. Apparently the admissions committee, unfamiliar with Japanese first names, did not recognize hers as female.

But wherever you were, you may very well have been told the following "joke" by the head of your department or your thesis advisor: "There have only been two women mathematicians in the history of mathematics. One wasn't a woman and one wasn't a mathematician."

Thus it may not be so surprising that in those years we were often accused of not having a sense of humor. (*Ms.* magazine addressed that issue with a famous pop art cover depicting the wry feminist humor typical of the '70s: A young man earnestly asks his woman friend "Do you know the women's movement has no sense of humor?" to which she answers straight faced "No... But hum a few bars and I'll fake it!")

It must be said however that, sometimes at least, this mathematical in-joke was told well-meaningly (if not misguidedly) — as it were, a friendly gesture to break the ice. Certainly, that's how I had interpreted it several years earlier at a party given by my department chairman when I was a graduate student at MIT. And it clearly was a manifestation of the time, of the awkwardness everyone felt with the few women around. (It did not occur to me until some years later that it was also a callous dismissal of two of the most important mathematicians in recent history.) The effect was nevertheless to help alienate us from our history, to reinforce self-doubts, and keep us mostly unaware of the strong women contemporaries who could very well have served as important role models and mentors had we known their existence early on: Mina Rees, Julia Robinson, Mary Ellen Rudin, Cathleen Morawetz, Olga Taussky-Todd, Jane Cronin Scanlon, and Marian Pour-El are a few such examples of mathematicians at that time who come to mind.

I do not want to give the impression that all professors and thesis advisors were hopeless. Some of us were fortunate to have supportive advisors during those important years. Lipman Bers is a stunning example of a professor who did much to encourage young women in mathematics. As he put it (in *MP*), "It never occurred to me that women can be intellectually inferior to men." Among his many female Ph.D. students are Lesley Sibner, Linda Keen, and Tilla Milnor.

What we did ... (In the beginning)

Atlantic City

I think it is fair to say that the AWM had its birth at the Joint Mathematics Meetings in Atlantic City in 1971. As Judy Green remembers (and Chandler Davis, early AWM friend, concurs):

> The formal idea of women getting together and forming a caucus was first made publicly at a MAG [Mathematics Action Group] meeting in 1971... in Atlantic City. Joanne Darken, then an instructor at Temple University and now at the Community College of Philadelphia, stood up at the meeting and suggested that the women present remain and form a caucus. I have been able to document six women who remained: me (I was a graduate student at Maryland at the time), Joanne Darken, Mary Gray (she was already at American University), Diane Laison (then an instructor at Temple), Gloria Olive (a Senior Lecturer at the University of Otago, New Zealand who was visiting the U.S. at the time) and Annie Selden. [Harriet Lord (then a graduate student at Temple, now at Cal State Polytech at Pomona) was at the MAG meeting but unable to stay for the women's caucus.]
>
> It's not absolutely clear what happened next, except that I've personally always thought that Mary was responsible for getting the whole thing organized...."

What I remember hearing about Mary Gray and the Atlantic City Meetings, indeed what perked my curiosity, was an entirely different event, one that was also to alter dramatically the character of the mathematics community. In those years the AMS was governed by what could only be called an "old boys' network," closed to all but those in the inner circle. Mary challenged that by sitting in on the Council meeting in Atlantic City. When she was told she had to leave, she refused saying she would wait until the police came. (Mary relates the story somewhat differently: When she was told she had to leave, she responded she could find no rules in the by-laws restricting attendance at Council meetings. She was then told it was by "gentlemen's agreement." Naturally Mary replied "Well, obviously I'm no gentleman.") After that time, Council meetings were open to observers and the process of democratization of the Society had begun.

Boston

Meantime, in the Boston area, women mathematicians had already been meeting. As Linda Rothschild writes:

> My involvement with AWM began in the late '60s, before it formally existed. In 1969, Alice Schafer, then at Wellesley, and I (a graduate student at MIT) organized a group of women mathematicians and students to meet every few weeks to discuss common problems and goals. Bhama Srinivasan joined when she started teaching at Clark in 1970. [According to Alice Schafer, the original group also included Bernice Auslander, Kay Whitehead, Caroline Series (then a graduate student at Harvard), Eleanor Palais and Linda Almgren Kime. Kime lived in Cambridge and that made an easy place for the group to meet.] When AWM was officially launched, our little group became the Boston area mafia of AWM. Through Alice's boundless efforts, an office was established for AWM at Wellesley, and it has been anchored there ever since....

Berkeley and me

In the beginning, I was quite ambivalent about the emerging women's movement in mathematics. As I replied to Linda Rothschild, "Thanks for the information. I was glad to have more details about the early days [of the AWM] in Boston. Things seem to have started up after I left (in '68) and it's not clear that I would have been involved... I was pretty 'unconscious' about such things at that time. It didn't hit me until I got to Berkeley."

The good thing about being "pretty 'unconscious' about such things" in those days was it left you free to do your mathematics. The bad thing of course was that either you internalized every negative message from society, subtle or overt, or else naively dismissed them as not meant for you. While I did not completely escape the former mode, I fit more naturally into the latter — which served me well up to a point, the point being that I also made important decisions naively.

A naive decision was for me to go to Berkeley.

After receiving my degree, I had an excellent job offer (assistant professorship) on the East Coast (Yale), my husband on the West Coast (Berkeley). We also had various joint offers, moderately good for each of us. We were up against the famous 2-body problem, classic for women mathematicians

as I was to learn later (from AWM *Newsletters*[3]). But at the time, we knew of no one who might offer some wise, even sympathetic advice. I ended up accepting a lectureship at Berkeley[4] being quite assured (by the department chairman and vice-chairman) that the position was competitive in practice (if not in title) with my other offers, and that things would work out. Of course they did not.

The spring of 1971 was a particularly bleak time for me professionally. But, then again, I was in Berkeley. It was the era of People's Park, Cambodia, and Vietnam. I would have had to have been totally unconscious not to be affected by the political events around me. But also, in truth, I found it quite exciting, reminding me of a much earlier period in my life. In the Math Department, Moe Hirsch, John Rhodes, and Steve Smale had organized a Colloquium series on "Social Problems Connected with Mathematics." When Steve asked me to chair a colloquium on "Women in Mathematics," I quickly agreed.

Since I didn't know much about women in mathematics, I found three women who did: Ravenna Helson, a research psychologist who had done a study on women mathematicians and the creative personality; Sheila Johannsen, a historian knowledgable about the history of women in mathematics; and Betty Scott, chair of the Statistics Department at Berkeley, who had just co-authored a report of the Academic Senate on the status of women on the Berkeley campus.

The colloquium panel was a great success. The lecture hall was packed. And it was quite an eye-opener for me. For one, it had never occurred to me that there might be common personality traits amongst women mathematicians, except perhaps that we were each unique.[5] It had never occurred to me how statistics could be a powerful political tool. I found Betty Scott's study a masterpiece, fleshing out cold data with poignant case studies. And then there was data that spoke clearly for itself, for example, her data on faculty positions in the Berkeley Math Department (ladder positions):

academic year	% women
1928/29	20
1938/39	11
1948/49	7
1958/59	3
1968/69	0

But also, it was the first time I had heard about Hypatia (born in Alexandria, c. 370 A.D., wrote and lectured on Diophantine arithmetic, butchered to death at the age of 45 by religious fanatics), Maria Agnesi, Sophie Germain, and more. Sonya Kovalevsky's motto, "Say what you know, do what you must, come what may," which many of us immediately adopted as our own, told me that this was a woman who could not be cursorily dismissed.[6]

After that event, I became known as *the* expert on women in mathematics, on the West Coast at least. More importantly, I started to meet regularly with some of the women math graduate students: Laif Swanson, Joan Plastiras, and Judy Roitman. And, to use Linda Rothschild's expression, this little group was to become the Berkeley "mafia" of the AWM.

The First Decade (1971-1981) Building the foundations, a time of many firsts

Mary Gray (1971–1973): The mother of us all

Without a doubt, Mary Gray is the founder of the AWM and the "mother of us all." As Carol Wood (who became AWM President in January 1991) put it:

> My overwhelming sense... is that AWM would not have existed when it did, if at all, without the energy and vision of Mary Gray. That is probably too obvious to say, and of course there are others who shaped, changed, nurtured, etc. in critical ways... But I was always struck by Mary's vision, and I think that our birthday party is an excellent opportunity to honor Mary...

I first remember seeing a small announcement for the new organization, the Association of Women in Mathematics, placed by Mary in *Notices*, February 1971. The first issue of the AWM *Newsletter* (clearly written by Mary) appeared that May listing Mary Gray as chairman. By the second issue, "of" was changed to "for", but I don't recall when "chairman" was replaced by "President."

The *Newsletter* has since become the very embodiment of the AWM. From the start, it was our forum for discussing the role of women in

mathematics, for exposing discrimination, for exchanging strategies, encouraging political action and, affirmative action, for informing, supporting, honoring, and of course, for job listings (which first appeared in the February 1972 issue). It has been our key linkage with each other, with credit due largely to Mary and subsequent editors, Judy Roitman and Anne Leggett.

Mary set down goals and agenda for the early AWM. In an article ("Uppity Women Unite!") in the January 1972 MAG *Newsletter* she wrote:

> We have some plans to improve the status of women in mathematics... There are two categories of problems, those involving the general female population and those involving professional women mathematicians. We must go back to the elementary schools — rewrite textbooks, use films, etc., and retrain the teachers and counselors. The goal is to show girls and boys that girls can and should learn mathematics... As a small first step, careful attention must be given by the mathematical community to the mathematical training of elementary schoolteachers, to see that they learn to like mathematics as well as learning mathematics...

Mary goes on:

> What do women want? Let me be specific as far as women mathematicians are concerned: 1) Equal consideration for admission to graduate school and support while there, 2)... for faculty appointments at all levels..., 3) Equal pay for equal work, 4) Equal consideration in assignment of duties, for promotion and for tenure, 5)... for administrative appointments at all levels in universities, industry and government, [and] 6)... for government grants, positions on review and advisory panels and positions in professional organizations. Because of past injustices, special efforts will have to be made for some time to find women to consider. AWM is ready to help. Now is the time for discrimination to end.

Mary Gray

What seems quite amazing now is that these were considered radical demands! Mary Gray informed us (sometimes in far greater detail than many of us cared to know) of legislation on discrimination and affirmative action and urged us to become involved. She was not afraid to say things straight, to take on the establishment single-handedly. Challenging the system, she successfully ran in 1976 as a petition candidate for Vice-President of the AMS. As Bhama Srinivasan said when we met in Berkeley last fall, "Mary had the courage, and willingness, to take the initial steps and the initial hostility... [charting a course] which eventually wiped out the 'old boys' network.' "

Not all women mathematicians were enthusiastic about the AWM in the beginning. For example, as Cathleen Morawetz (in *MP*) puts it, "I did not want the Association for Women in Mathematics to speak for all women mathematicians. I joined them later, but at that time they were terrible attackers... "

Nevertheless, she played an important role herself in changing the consciousness about women in mathematics.

> I was on a committee for disadvantaged groups in the Math Society, and I thought there should be a separate committee for women. I was terribly afraid when I went before the Board of Trustees — or it may have been the Council. Anyway, when it came my turn to speak, I said 'There's a problem with women. You may not have noticed that there are not many women mathematicians.'

Cathleen continues,

> At that point Saunders Mac Lane said, "Well, mathematics is a very difficult subject." I was not up to coping with that, but Iz Singer picked

up the ball. The committee [on women] was formed and I was made chairman...

In 1973, the Committee on Women published the first Directory of Women Mathematicians.

Alice Schafer (1973–1975): AWM Incorporated

In terms of its organizational structure, I picture AWM as an evolving continuum (built with boundless energy and grass roots networking). There is considerable overlap between one presidency and the next. Indeed, the boundaries between terms often seem quite hazy with each subsequent President building on what came before — as well as each preceding President continuing to stay actively involved. Nobody seems to take a back seat and nobody seems to retire.

This dynamic was already in evidence in the first transition from Mary Gray to Alice Schafer: "When I took over the presidency, Mary sent me a box with all sorts of papers, checks, etc... When I asked [her] what I could do, she suggested getting AWM incorporated." Alice then goes on to relate her struggles setting up an official structure for the fledgling organization.

> That was done through a lawyer in Boston, who I had been told would charge very little, so I was amazed when he charged $500, which was really big money for AWM, and so, in the *Newsletter*, I asked for a contribution of a dollar from each member. Some gave and AWM did finally pay the bill. When it came to obtaining tax exemption status from the IRS, the lawyer said he would do it and I said first I would try. He said I could not do it, but [nevertheless] I did...

In the early days, money was indeed a problem. And so Alice continues:

> Do you recall that one time the March *Newsletter* was printed in such small print in order to save money that many people could not read it? I think that was during my presidency. However, I do not recall that anyone sent in a contribution because of it [to help us out], but I may be wrong.

For those of you who were not around during those years, and for those of us who may have forgotten, Alice goes on to paint a colorful, and almost slapstick, picture of what we were up against and how she handled it:

> One of the... funny things that happened, that I recall, during my presidency is that when the meeting was in San Francisco [January 1974] AWM was still being harassed by the male mathematicians. Lee Lorch, friend of AWM, came to tell me that some of the men were going to attend the AWM meeting, which I was chairing of course, and were going to break it up. He thought I ought to be warned. I was glad of the warning and told him that teaching in high school for three years (before I had enough money to start graduate school) ought to prepare me for that! Actually, what is interesting, historically, is that meeting was the first time AWM had ever sponsored mathematical talks; before that it had all been consciousness raising. I had invited Cathleen Morawetz and Louise Hay to give short talks on mathematics... and had scheduled them ahead of the consciousness raising part, and of course, their talks were good. The men, who were for the most part sitting in the last two rows

Seated left to right: Alice Schafer, Carol Wood, Jill Mesirov, Rhonda Hughes. Standing left to right: Ruth Charney, Bettye Anne Case, Eleanor G. D. Jones, Susan Geller, Jenny Baglivo.

in the audience, never said anything. I never knew who they were and it didn't matter...

During this period, in addition to building its own internal structure, the AWM was also beginning to establish itself as a legitimate professional society, to be reckoned with amongst its peers, i.e. other mathematical organizations. To the consternation of the men who were "sitting in the last two rows" (whose shenanigans were once again foiled by Alice),[7] by the end of Alice's term AWM was about to be admitted as an affiliate member of the Conference Board of Mathematical Societies (CBMS), the umbrella society of mathematical organizations. By the time I became President, all I had to do was put on the finishing touches, and there we were, on the same Council (and on the same CBMS letterhead) with such organizations as the AMS, ASL, IMS, MAA, NCTM, SIAM, ASA, ACM, and ORSA, among others. An amazing feat for an association that was only four years old!

In its first venture into internationalism, AWM sponsored a panel at the International Congress of Mathematicians (ICM) in Vancouver, the summer of 1974, to compare the situation for women in mathematics worldwide. Speakers included: Sheila Brenner (England), Michele Vergne (France), Bhama Srinivasan (India), and Xuan Hoang (North Vietnam). Other firsts in the mathematical world during this period included Barbara Osofsky's AMS Invited Address in Dallas, January 1973 — the first such address at a national meeting by a woman since Anna Pell Wheeler's Colloquium Lectures in 1927[8] — and Sloan fellowships awarded to Joan Birman and Karen Uhlenbeck in 1974.

Lenore Blum (1975–1978): Exploring new territory

In August 1975, I became President of the AWM (and served in that capacity for three years.) Since Mary had already captured the attention of the mathematics community head on, and Alice had set up the foundation for a working organization, I was mostly free to explore new territory. It seemed clear that the provincial view of mathematics — including who a mathematician was, and what a mathematician did — was a prime factor in the exclusion of women, as well as others, from the field. It also seemed clear that the provincial view was potentially limiting to the discipline itself.

So, to make this "statement," as well as to further educate myself, I decided to use the public forum which had proved so successful in Berkeley.

In those years, the academic job market for mathematicians was very tight. Many young people were in a terrible bind, given the prevailing view that the only respectable work for a mathematician was in academia. Since women mathematicians had been finding creative alternatives to academic employment for years, their experiences could be particularly useful, perhaps even change an image. I organized a panel on "Women Mathematicians in Business, Industry, and Government" for the January 1976 Joint Mathematics Meetings in San Antonio (and a similar one in Seattle, the summer of 1977). Here I met for the first time: Marjorie Stein, a mathematician working at the U.S. Postal Service (Statistical Service Requirements Division); Jessie MacWilliams, a coding theorist at Bell Labs; Mary Wheeler of Rice, also a consultant for oil companies, working on numerical solutions to P.D.E.'s; Marijean Seelbach, a topologist and functional analyst working on optimal control theory at NASA–Ames. These energetic women had clearly found unusual and challenging career paths for themselves utilizing their mathematical training and skills. It was quite inspiring.

Many of us were eager to explore further our history. I decided to organize some panels at the Joint Math Meetings on the "History of Women in Mathematics" with AWM members as speakers. What was so powerful about these sessions, even historic in itself, was that for the first time women mathematicians were talking about women mathematicians (their lives and their work) to women mathematicians. By understanding their work, possibly even identifying with their lives, the speakers were able to convey uniquely meaningful, deeply personal portraits of the women who had come before us. The sessions were charged!

In Toronto (summer 1976), Mary Gray talked about Sophie Germain and her work (a bicentennial perspective), Linda Keen about Sonya Kovalevsky (her extraordinary life and mathematical achievements), Martha Smith about Emmy Noether (her work and tremendous influence). As an added treat, Emiliana Noether came to talk

about her aunt (-in-law). In St. Louis (at the infamous cold winter Meeting of 1977), Teri Perl told us about the "Lady's Almanac," a popular women's magazine published in England from 1704 to 1841, devoted in large part to mathematical questions and solutions.

But perhaps one of the most moving occasions was when Sylvia Wiegand spoke of her grandmother, mathematician Grace Chisolm Young. Because women were not admitted to graduate schools in England at the turn of the century, Grace went to Germany and became the first woman to receive a formal degree in mathematics in Göttingen — indeed the first woman Ph.D. in Germany in any field. When she returned to England, she married William Young, her former tutor. Sylvia read a poignant letter from her grandfather to her grandmother, written some years later:

> I hope you enjoy this working for me... I am very happy that you are getting on with the ideas. I feel partly as if I were... setting you problems which I could not quite do myself but could enable you to...
>
> The fact is that our papers ought to be published under our joint names, but if this were done neither of us get the benefit of it. No. Mine the laurels now and the knowledge. Yours the knowledge only. Everything under my name now, and later when the loaves and fishes are no more procurable in that way, everything or much under your name.
>
> This is my programme. At present you can't undertake a public career. You have your children. I can and do.[9]

An historic panel, "Black Women in Mathematics," organized by Pat Kenschaft and Etta Falconer, was held in Atlanta, January 1978. Of the twelve black women in the U.S. holding Ph.D.'s in mathematics at the time (more of course held degrees in mathematics education), six were on the panel: Geraldine Darden, Elayne Idowu, Eleanor G. Jones, Evelyn Roane, Dolores Spikes and Etta Falconer.[10]

These AWM sessions at the national meetings were immensely popular. We were clearly identifying and addressing subjects of interest and issues of concern to the mathematics community-at-large (well before these issues were recognized by the establishment as legitimate, even critical). As a consequence, we began to broaden our constituency, attracting people who had perhaps felt uncomfortable with the more political tone of earlier days.

But political issues were nevertheless still very much on our minds. We provided testimony for congressional investigations, wrote university presidents and newspaper editors and letters (often signed jointly by the three Presidents Mary, Alice and me) protesting objectionable images of girls and women in textbooks, the media, and advertising. (In school math books, girls were still calculating the perfect recipe, while boys calculated the time to get to the moon. Flyers depicting a naked woman contemplating a calculator were still being distributed at the Math Book Exhibits in 1976.) In 1978, a masterful combination of teamwork and old girl networking resulted in decisions by the AMS and MAA not to hold national meetings in states that had not ratified the ERA (Equal Rights Amendment). At the International Congress in Helsinki (ICM-78), a special meeting was called by the AWM to protest the absence of women speakers. Over 500 people attended. I introduced a resolution (amended by Lee Lorch) urging this situation be rectified by the next Congress. The resolution passed by a near-unanimous vote (only three dissenters).

It was a time of heady issues, but also a time of great excitement and great fun. It was a time of newly found camaraderie, of friendships, of support and respect among women mathematicians.

I was clearly a beneficiary of this "sisterhood" during my presidency. Besides the two former Presidents to guide me, Judy Roitman was *Newsletter* Editor and Judy Green, AWM Employment Officer (a title deemed appropriate since she had taken it upon herself to analyze employment data and monitor the legitimacy of job advertisements). Both Judys were co-Vice-President.

Judy Roitman and I had become great friends during the early Berkeley days, and as I wrote in the November 1978 *Newsletter* welcoming her presidency, "... our friendship has grown with, indeed, has been intertwined with, our involvement in... the AWM." She was (and is) a great — and speedy — writer, and since writing was not one of my better skills, many a President's Report was told (I can hardly say dictated) to her over the

phone the night before the *Newsletter* went to press.

Judy Green often played the role of political advisor, telephone consultant, as well as AWM liaison with the Mathematics Action Group (MAG) and the National Association of Mathematicians (NAM), the association for black mathematicians. In preparing this history, I queried her: "Even though you were never President, you very well could... have been. How come we never could get you to 'run'? You were doing a lot of the work de-facto anyway." To which she replied, "... I'm much better helping people than being in charge. I really don't like being out there in front. Judy Roitman and I were co-Vice-Presidents since neither one of us would say we'd be President-elect. At the end, she gave in before I did!" That also helps explain why my term lasted as long as it did!

Discrimination/Affirmative Action. Before going ahead, I would like to take out a few moments to address directly a few aspects of the twin issues of discrimination and affirmative action that were so central to our lives in those years.

The AWM gave women mathematicians courage to speak out publicly, even file complaints and charges about their own situation. As a consequence, our files were overflowing with correspondence from women documenting discrimination, seeking assistance and advice. Mary Gray, being the most knowledgable, handled most of these cases throughout the 1970s, but we all did some.

Affirmative action rulings often produced backlash and many abuses. For example, in order to satisfy affirmative action guidelines, many math departments resorted to "papering the files," inviting women to apply for jobs that didn't exist or had already been offered to men. A related practice is illustrated by the following letter from a woman mathematician on the East Coast to the Vice-Chairman of the Math Department on the West Coast. The names have been removed, not so much for anonymity, but rather to stress genericity:

> Dear Professor X, This is the third consecutive year that I have been invited to apply for the position of Assistant Professor in the Mathematics Department of [West Coast University]. I assume it is the third year of [WCU]'s Affirmative Action program. As I mentioned in my last response to such an invitation, I have been Associate Professor since the first year. It is hard to believe that [WCU] is serious about its Affirmative Action program if it makes no attempt to match the experience of the candidate considered with the positions available. Would you be interested in a job as Assistant Professor?
>
> Sincerely, Y

Indeed, while many in the mathematics community believed that there was an influx of women faculty as a result of affirmative action, the data in the early years showed quite the contrary. As an example, between 1973-1974 and 1974-1975 the percentage of women in regular math faculty positions, in most instances, actually went down; and no significant rise became evident until very much later. (See Judy Green's article in the April 1975 AWM *Newsletter*, mine in the May-June 1976 CBMS *Newsletter*, and Mary's and Alice's in *Notices*, October 1976.)

Judy Roitman (1978–1981): A summing up

The early years of the AWM were a time of activism, of speaking out, of politics, of confrontation, of heroes and villains — when issues seemed almost black or white. Judy Roitman provides a perspective on the decade:

> I can summarize my time in AWM office by saying that I was one of the last — perhaps the last — President of an amateur AWM. What do I mean by this?
>
> The AWM grew out of the feminist movement of the 1970s, which was marked by confrontation, attention to, and expression of, personal feelings and individual incidents, and ignorance of history. Having finally read some of this history (Margaret Rossiter's excellent book on American women scientists) I suspect that had we known how closely we were following in the footsteps of earlier feminists, and how little change their tremendous efforts made, we probably never would have bothered. So the early job of the AWM was just to look around us and report the obvious — the situation for women was terrible — and the apparently not-so-obvious — it didn't have to... be that way. We spent a lot of time popping up at meetings (departmental, local, national) saying over and over again that women could be perfectly good, even great,

> mathematicians if given the opportunity... and that there were several steps the mathematical community could take to improve things for both women and minorities. It was an easy kind of agitation — you just had to look around you and report what you saw...
>
> But while this style had its successes, it was based on a sort of shooting from the hip. That is why I characterize it as being amateur...[12]

It was also a time of lassoing people in. In addition to national meetings of the AWM, members were organizing and meeting regionally: Sue Montgomery and Ruth Afflack in Southern California, Rebekka Struik in the Rocky Mountain region, Jessie Ann Engle, Judith Longyear and Vera Pless in the Midwest, Pat Kenschaft in New Jersey, Linda Keen in New York, to mention only a few. In the mid-1970s, AWM instituted an Open Council, encouraging the participation of members representing a wide range of self-identified constituencies and areas of interest.[13] By 1981, AWM had grown to over 1000 members (from the U.S. and fifteen other countries), its influence and political power ranging far beyond these numbers. For example, then and over the years, AWM-supported candidates in AMS elections have been quite likely to win.

The 1970s were certainly a time of increased consciousness about women in mathematics. It was also a time of many firsts. Two notable additions to those already mentioned are Julia Robinson's election to the National Academy of Sciences[14] and Dorothy Bernstein's election as President of the Mathematical Association of America (MAA), both in 1975. During Judy Roitman's term, the AWM Noether Lectures (chaired first by Karen Uhlenbeck) were inaugurated by Jessie MacWilliams at the San Antonio meeting in January 1980.[15]

But also, it was a time of solid program development and achievements. During those years, many of us were involved in designing and implementing educational programs to increase the participation of girls and women in mathematics. Other organizations — such as the Math/Science Network, headquartered in the San Francisco Bay Area, and Women and Mathematics (WAM), founded by the MAA — to which many AWM members belonged, were also very much part of this effort. Since the old system was clearly not working for us, we were motivated to explore new paradigms in teaching: developing hands-on activities and materials stressing problem solving skills, promoting team teaching and cooperative learning, providing role models and information to students (as well as their parents and teachers) about why mathematics was important for their future.[16] Of course, all this made sense in general. And indeed, educational programs we developed in the 1970s are now models for educational reform in the 1990s. A stellar example is Nancy Kreinberg's EQUALS teacher training program at the Lawrence Hall of Science in Berkeley. (Many articles describing successful educational programs and strategies can be found in AWM *Newsletters*.)

Judy Roitman

- to be continued -

Footnotes

1. The AWM was established in 1971 to serve and encourage women to study and have active careers in the mathematical sciences. Membership, now numbering over 4000, includes both women and men from the United States and around the world, representing all parts

of the mathematical community. For more information about the AWM, its programs and activities write: AWM, Box 178, Wellesley College, Wellesley, MA 02181.

2. Symposium speakers were: Carolyn Dean, Bernadette Perrin-Riou, Mei-Chi Shaw, Jiang-Hua Lu, Ruth J. Williams, Laurette Tuckerman, Lynne M. Butler, Joan Feigenbaum, Elise Cawley and Jill Pipher. Graduate student speakers were: Andrea Bertozzi, Jill Dietz, Ellen Gethner, Miilja-Riita Hakosalo, Deanna Hausperger, Kitty Holland, Diana Major, Susan Schwartz, Melanie Stein and Julia Yang. Debbie Lockhart and Hugo Rossi led the Luncheon discussion.
3. See for example, Rebekka Struik's article, "The Two City Problem," (AWM *Newsletter*, September 1974) or Marian Pour-El's article in *Mathematics Tomorrow* (edited by L.A. Steen, Springer-Verlag, 1981).
4. Here I was in illustrious company. Before me there was Julia Robinson who, from time to time, was a lecturer at Berkeley until she was elected to the National Academy of Sciences in 1975 (and then immediately promoted to full professor). With me as lecturer was Karen Uhlenbeck. After that, there was a long line of prominent women mathematicians (and AWM members) including Chuu-Lian Terng, AWM President Jill Mesirov, and Ruth Charney, member of the AWM Executive Committee.
5. Although, when I thought back, the three women in my class in graduate school all had been born in New York City, all were Jewish (at least in part), all studied at women's schools, married in college, had babies while in graduate school, and all studied logic.
6. There is an interesting story here which I heard then for the first time. In 1888, Kovalevsky submitted her paper, "On the Rotation of a Solid Body about a Fixed Point" to the French Academy of Sciences to compete for the Prix Bordin. Papers had to be submitted anonymously with signatures coded by the author. That motto was Kovalevsky's code. Her anonymous paper was deemed so exceptional that the prize money was increased from 3000 to 5000 francs.
7. As I recall, shortly after the AWM applied for affiliate membership in the CBMS, a mysterious math society, apparently originating in the mid-west, decided it also was worthy of CBMS membership. Its application caused something of a commotion, prompting the CBMS to reevaluate its membership criteria. This delayed AWM's entrance for about a year, but in the end, AWM was able to meet the stiffer requirements.
8. In the interim, women had been invited sporadically to speak at local meetings: Pauline Sperry (1933), Emmy Noether (1934), Olga Taussky-Todd (1959), Cathleen Morawetz (1969), Mary Ellen Rudin (1971), Mary Elizabeth Hamstrom (1972).
9. See AWM *Newsletters* and also, *Math Equals* by Teri Perl, (Addison-Wesley, 1978). A number of biographies of women mathematicians by women mathematicians have appeared in the *Newsletters* over the years. As an example, in the July 1978 issue, Bhama Srinivasan writes about Ruth Moufang (1905–1977), dedicating her article to the many mathematicians who have exclaimed, "You mean Moufang is a woman?"
10. Their stories are published in the September 1978 and May-June 1980 *Newsletters*. Also see Pat Kenschaft's article, "Black Women in Mathematics in the United States," (*American Mathematical Monthly*, vol. 8, no. 6, 1981). Lee Lorch plays an important role here. Three women who studied with him at Fisk (during the period 1950-1955) went on to get Ph.D.'s in mathematics: Etta Falconer, Vivienne Mayes-Malone and Gloria Hewitt.
11. Y, a pioneer in the application of non-linear mathematics to understanding chemical and biological phenomena, is recipient of numerous honors and awards, including a Sloan, a Guggenheim and a MacArthur "genius" award.
12. Not completely. It should be noted, for example, that the AWM by-laws were written and passed during Judy Roitman's term. Creatively, they stipulated both formal structure and procedures for AWM's governance, while at the same time leaving room for flexibility.
13. An impressive list of such Council members, contained in the September 1978 *Newsletter*, indicates broad AWM membership interests and affiliations: pure and applied mathematics research; colleges, universities and research institutions; math education; career counseling; teacher education; four-year state colleges; two-year community colleges; high school math teachers; history; and retired women.
14. According to (*MP*), "when the University [of California at Berkeley] press office received the news [of Robinson's election], someone from there called the mathematics department to find out who Julia Robinson was. 'That's Professor Robinson's wife.' 'Well,' replied the caller, 'Professor Robinson's wife has just been elected to the National Academy of Sciences.' "
15. The Emmy Noether Lecturers have been: F. Jessie MacWilliams, Olga Taussky-Todd, Julia Robinson, Cathleen S. Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan S. Birman, Karen K. Uhlenbeck, Mary F. Wheeler, Bhama Srinivasan, Alexandra Bellow.
16. In 1979, at the summer meeting in Duluth, Judy Roitman organized an AWM panel "Mathematics Education: A Feminist Perspective " to discuss these new programs and strategies. Speakers included: Deborah Hughes Hallett, Diane Resek, and myself.

by Lenore Blum

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AMS ELECTION STATEMENTS

Hermann Flaschka, Professor, University of Arizona

Promotion of mathematics research has been, and still is, the Society's first goal. Its officers and committees, however, should also take an interest in other issues that affect and complement the research enterprise, among them: demographic changes and uncertainties in public funding, recruitment from underrepresented groups, education at all levels, and mathematical exposition for scientists and laymen.

Joshua A. Leslie, Chairman, Howard University

For the AMS to carry out its primary function, which is to encourage and facilitate mathematical research, it should safeguard whatever gains there have been in the formation of women and so called "minority" mathematicians. The present political climate in the world and in this country of an apparent shift to the right has its dangers. In particular, it is necessary for mathematicians to do what they can to prevent the prevailing legal attitudes of the Supreme Court to impede the mathematical education of "minorities."

In spite of the current widespread antipathy to conscious social engineering, I feel that the AMS should take stands on mathematical education throughout the educational process. This could mean more active participation in curriculum criticism and formation for the primary and secondary school systems.

I would use a position on the Council of the AMS to do what I can to see to it that these issues are present in the deliberations of the AMS.

Gunther A. Uhlmann, Professor, University of Washington

There are three areas, in my opinion, crucial to the future of our profession, to which the AMS should give special attention: (1) Primary and secondary education; (2) More individual research grants from funding agencies; very good researchers are losing grants and this creates serious problems; (3) Improvement of the abysmal job market for recent Ph.D.'s by all possible means. In addition, the AMS should vigorously continue to pursue the policies of getting underrepresented groups into mathematics.

NAS SCIENTIFIC VISITS

The National Academy of Sciences invites applications from American scientists who wish to visit the USSR, Bulgaria, Czechoslovakia, Hungary, Poland, Romania, and Yugoslavia. Applicants must be U.S. citizens and must possess doctoral degrees or their equivalent in the sciences six months prior to the requested beginning date of their visits. The program has a special emphasis for young investigators.

Applicants for the project development visits need to demonstrate that joint proposals for collaborative research will be prepared during their visits for submission to the National Science Foundation for funding. Applications for this program must be postmarked no later than November 30, 1991, for visits during April through August 1992 and February 29, 1992 for visits during August through December 1992.

American scientists interested in visiting the USSR or Eastern Europe in 1993 may apply to the NAS for travel grants to help defray the costs of the visits. Also, American scientists interested in receiving scientific colleagues from the USSR or Eastern Europe may apply for travel grants to help support the visitors. Applicants are expected to make all logistical and administrative arrangements for the visits since NAS will no longer organize exchange programs through counterpart academies of sciences.

Application deadlines for these programs are February 29, 1992 for long-term (one to six months) research visits in 1993; September 30, 1992 for project development visits to take place between January and June 1993; and February 28, 1993 for project development visits to take place between July and December 1993.

Address application requests to: Soviet and East European Affairs, National Academy of Sciences, 2101 Constitution Ave., NW, Washington, DC 200418; (202) 334-3680.

CRA COMMITTEE

The CRA (Computing Research Association) Committee on the Status of Women in Computer Science and Computer Engineering has recently been created. The goal of this committee is to maintain and increase the number and status of women participating in computer science research and education at all levels. The underlying principle of the committee is to be action-based, undertaking projects that will result in significant progress toward eliminating the barriers to full participation by women in computer science research, including barriers in the pre-college pipeline, in higher education, and in professional advancement. Because there is a limit to how much each of us can personally do, we are focusing on activities that will help others to get involved. The emphasis will be on providing information about successful current programs, writing proposals for funding agencies to set up and support programs, and disseminating information.

The initial membership of the committee is: Co-Chairs: Prof. Maria Klawe, University of British Columbia and Prof. Nancy Leveson, University of California, Irvine; Members: Prof. Ruzena Bajcsy, University of Pennsylvania; Dr. Sandra Baylor, IBM Research Lab; Prof. Fran Berman, University of California, San Diego; Prof. Thelma Estrin, UCLA; Dr. Joan Feigenbaum, AT&T Bell Labs; Prof. Michael Fischer, Yale University; Prof. Barbara Grosz, Harvard University; Prof. Marilyn Livingston, Southern Illinois University; Prof. Nancy Lynch, MIT; Dr. Jill Mesirov, Thinking Machines; Prof. Richard Tapia, Rice University; and Prof. Elaine Weyuker, NYU.

The Computing Research Association (CRA) was organized in 1972 as the Computer Science Board. From 1972 until 1985, the CRB operated as an informal organization that represented the interests of computer science researchers. Computer engineering was added in 1985. In June, 1988, the Computer Research Board was incorporated as a non-profit corporation and the name was changed to the Computing Research Association.

The CRA is an association of academic departments of Computer Science and Computer Engineering (currently over 160 universities are members), industrial laboratories that engage in basic computing research, and affiliated professional societies with a primary interest in computing (the ACM is a member).

The mission of the CRA is twofold. First, it helps strengthen research and education in the computing fields through publications, surveys, conferences, and other such professional activities. Second, through various communications programs, it seeks to improve the understanding by the public and policy makers in government and industry of the important role in our society played by computing and computing research.

The goals of the committee are: to increase the number of women in all types of research and in the faculty ranks at universities, including both the research universities and the 4-year teaching colleges; to increase the degree of success experienced by women researchers as measured, for example, in terms of: obtaining appropriate professional positions, advancing appropriately, research recognition (awards, lectureships, invited presentations), professional respect, research support, consulting opportunities, editorships, salary, program committee memberships and chairships, advisory boards, and department chairships and other leadership positions; and to provide a forum for addressing problems that are of concern to women (and men) such as career-family conflicts, maternity, child care, two-body problems, discrimination, and harassment.

The members of the committee will serve as coordinators of the various activities, but much help will be needed from others (both women and men). We hope you will be willing to join us in this effort. We have planned some initial activities with more long-term activities after we get these started. The addresses of the coordinators are given below; those of you who would like to participate are encouraged to contact the appropriate person.

Databases and Lists: Joan Feigenbaum (jf@research.att.com): This project will collect and disseminate names and other information about women researchers and graduate students in CS and CE. It will also monitor the level of participation by women in various types of professional activity within computer science research. Examples of such activities include

editorial boards, program committees, membership in prestigious organizations, positions within professional societies, etc.

Women's Speaker's List: Marilyn Livingston (lvngstn@eecs.umich.edu): This will be coordinated with the database project and will involve making a list of women speakers and topics on which they are willing to give invited talks.

Surveys: Nancy Leveson (nancy@ics.uci.edu): In order to plan further activities, it is important to understand where we are. This project will collect information from students and faculty in the form of scientific surveys to learn more about the dimensions of the problems we face.

CRA Newsletter: Fran Berman (berman@cs.ucsd.edu): The Editor-in-Chief of the CRA *Newsjournal* has agreed to have a column from our committee in each issue. The *Newsjournal* comes out six times a year. Columns will also be available and distributed electronically. Periodically, the columns will be compiled as technical reports to provide a more permanent collection of information and will be available upon request.

Enhanced Communication: Michael Fischer (fischer-michael@cs.yale.edu): There are several ideas for communication being considered including a newsletter (perhaps electronic) or a moderated mailing list that provides more focused dissemination of information and opinions and is open to everyone.

Mentoring Activities: Maria Klawe (klawe@cs.ubc.ca): This is a broad activity encompassing mentoring programs at all levels from K-12, undergraduate education, graduate education, and faculty. Our goal is to provide information about successful programs that already exist and possibly to initiate new programs such as a Distributed Mentoring Project to match up female researchers and undergraduates for summer research experiences at different universities.

Career Booklet: Thelma Estrin (estrin@cs.ucla.edu): This project will develop a career booklet to describe careers in computer science, highlighting successful women.

Student Awards: Jill Mesirov (mesirov@think.com): The Association of Women in Mathematics has recently established a very successful award for female undergraduates in mathematics. The aim of this project is to create analogous awards at the undergraduate and graduate levels in computer science.

Regional Workshops: Nancy Leveson (nancy@ics.uci.edu): This project will provide information on how to hold a regional workshop and information about previous successful ones. The workshops may be research oriented (having women speaking on their research) or informational (e.g., career opportunities, how to be a successful graduate student, tips for writing research funding proposals).

Graduate School workshops: Maria Klawe (klawe@cs.ubc.ca): This involves bringing together the top male and female third year CS students from many different departments and universities in an area for a weekend to encourage them to attend graduate school in computer science.

The committee also discussed a broad range of other activities that might be considered for the future. These ranged from projects involving interaction with grades K-12 (preparation of materials for enhancing the curriculum, review of curriculum materials for gender bias, teacher education, summer and after-school programs for high-school students) to lobbying companies and foundations to establish chairs for female faculty in computer science, and educating funding agencies about the special difficulties of female and minority researchers.

There is much to be done, and whatever we accomplish in the next few months is only a first step. Still, with everyone's help we can make a difference. Please join us.

DUES! DUES! DUES!
DUES! DUES! DUES!

Dues are now past due. Please send yours in if you haven't done so already. Get your institution to join. Become a supporting member. Sponsor a student.

DUES! DUES! DUES!

Alice T. Schafer and Schafer Prize Winner Jèanne Nielsen

Schafer Prize Winners with Alice T. Schafer and Carol Wood

THE UNITED STATES COMMISSION ON MATHEMATICAL INSTRUCTION

Educators in the United States, like other citizens, tend to be somewhat parochial and insular in their outlook. We simply aren't aware of what other countries are doing, and often we don't really care. The list of the five key curricular areas recently agreed to by the governors and federal authorities (English, mathematics, science, history, and geography) is notable for its omission of foreign language. How can we hope to understand developments, both good and bad, in other countries if we don't even speak the language?

In mathematics education there have been several efforts to mitigate this insularity. The United States Commission on Mathematical Instruction (UCSMI) is one such effort. The USCMI is a subcommittee of the United States National Committee for Mathematics (USNCM) and is charged with advising the National Academy of Sciences on matters pertaining to the International Commission on Mathematical Instruction. Beyond that, the USCMI has a general concern for all matters of international importance in mathematics education.

Recent activities of the USCMI have included: (1) helping to plan, publicize, and evaluate International Congresses on Mathematical Education (ICME); (2) assisting in obtaining funds to support participation in ICMEs and administering those funds; (3) serving as the official U.S. delegation to ICMEs; (4) sponsoring presentations regarding ICMEs and other international congresses (for example, USCMI is sponsoring a panel discussion on ICME-7 at the Joint Mathematics Meetings in Baltimore, January 8, 1992, and at the NCTM meeting in Nashville, April 1-4, 1992); (5) encouraging participants at ICMEs to share insights with colleagues through panel discussions, speeches, and articles; (6) arranging for publication of books summarizing the insights of selected ICME participants; for the 1988 Budapest Congress this was *American Perspectives on the 6th International Congress on Mathematical Education* (NCTM, 1989); (7) encouraging pre-international congress expository talks about mathematics; and (8) helping to publicize and encourage participation in other international mathematics education activities (such as the August 3-7, 1991 InterAmerican Conference on Mathematics Education held in Coral Gables, Florida).

USCMI appears to trace its history to the Fourth International Congress of Mathematicians (ICM) held in Rome (1908). At that Congress, David Eugene Smith (an early U.S. mathematics educator) suggested creating an International Commission on Mathematical Instruction with the assignment to report back at the next ICM on the state of mathematics education in the various countries. Smith chaired the USCMI, created to respond to this assignment, that met for the first time on March 26, 1909.

In its modern incarnation, the USCMI has encouraged participation in all of the International Congresses on Mathematical Education: Lyons, France (1969), Exeter, U.K. (1972), Karlsruhe, Germany (1976), Berkeley, U.S.A. (1980), Adelaide, Australia (1984), and Budapest, Hungary (1988).

ICME-7 will be held in Quebec, Canada on August 16-23, 1992. USCMI encourages participation in the Congress by as many U.S. citizens as can possibly attend. [See the September-October *Newsletter* for more information.]

Stephen S. Willoughby, University of Mathematics
Chair, U.S. Commission on Mathematical Instruction

AMS TASK FORCE

The July/August issue of the AMS *Notices* contains a copy of the report of the Strategic Planning Task Force. The report advises the Society to expand its emphasis on communicating quality mathematical research and work. In addition, it calls for the Society to develop ways to communicate the importance of mathematics and mathematical research and the issues surrounding them to a much larger audience by establishing closer links with the mathematical applications and education communities.

ARTICLES OF INTEREST

The September 1991 issue of the AMS *Notices* is a special issue on women in mathematics. It's certainly all worth reading!

An editorial, "Heroines and Role Models," appearing in the July 19, 1991 issue of *Science* is taken from a commencement address delivered at Barnard College by Maxine F. Singer, President, Carnegie Institution of Washington. The point of the editorial is that young women need heroines, not role models. From the article:

> Why then do young women now speak so often of role models and so rarely of heroines? Why are heroines and even heroes so out of fashion? Nobility of purpose is not currently admired; our society is afraid that following such a leader will extract too high a cost from us as individuals or as a nation. Rather, we deny greatness and seek instead a false image of equality. In our compulsive effort to make everyone ordinary we assume license to delve into personal matters, from the trivial to the profound; unsurprisingly, the glorious images are tarnished. And for those who are truly great, where the effort to make them ordinary cannot succeed, we strive to make them evil. Not even the giants of our world can escape. Consider the sad efforts to tarnish Martin Luther King's image, as if that could undermine his greatness.

"Women's panel formed" by Margaret Ryan, *Electronic Engineering Times*, August 26, 1991 reports on a committee established by the National Academy of Sciences/National Research Council designed to attract women to careers in science and engineering.

> The committee will collect, analyze and disseminate information on the needs of and opportunities for women in science and engineering. It also will review federal and other policies designed to enhance the role of women in science and engineering, and formulate policy recommendations to develop programs that remove barriers to the participation of women in these fields.

Two recent publications contain disquieting salary information. The Commission on Professionals in Science and Technology (formerly Scientific Manpower Commission), a participating organization of the American Association for the Advancement of Science, has published *Salaries of Scientists, Engineers and Technicians* by Eleanor L. Babco; the findings indicate that the economy has taken a toll on these salaries. *The Scientist*, August 19, 1991 contains "New NSF report on salaries of Ph.D.'s reveals gender gaps in all categories" by Edward R. Silverman.

The latter article reports on the findings of a National Science Foundation survey. It "reveals that female Ph.D. researchers earn less than their male colleagues in every field of endeavor and employment sector." For all fields, men's median salary is $54,500, while women's is $44,400. Among mathematicians, the corresponding medians are $52,400 and $43,800; among statisticians, $51,700 and $48,300; among computer/information specialists, $60,100 and $50,000.

From the press release for the Commission's publication:

> Salaries of experienced scientists and engineers have remained flat during the past years, as a result of a stagnant economy felt throughout the U.S. Although salaries of these professionals inched upwards between 1989 and 1991, the small gains were often offset by increased contributions they were forced to make to employee benefit plans or other salary-affecting factors, including inflation....
>
> Doctoral scientists and engineers working in industry reported the highest median salary, while those working in state and local governments reported the lowest. Teaching, the dominant work activity of doctoral scientists and engineers, continues to provide the lowest annual salary, while Ph.D.'s working in R&D management earn the most.
>
> Overall, women doctorates in science and engineering earned 25% less than men in 1989, a discouraging figure for women, since the salary gap has widened from 20% in the 1985-1987 period. White Ph.D.'s earned more than minority Ph.D.'s, and women earned less than minorities. By citizenship, native-born citizens with doctorates earned less than those who were naturalized U.S. citizens, but non-U.S. citizens working in the U.S. earned the least, regardless of field....

For the first time in a decade, faculty salaries in 1990-91 failed to keep pace with the cost of living.

Thanks to Allyn Jackson, Cathy Kessel and Cora Sadosky for bringing these articles to our attention.

BRIEF NOTES

Della Dumbaugh Fenster of the University of Virginia will be speaking at the Special Session in the History of Mathematics at the Joint Meetings in Baltimore. She will speak from 3:50 to 4:20 P.M. on Saturday, January 11 on "Women in the American Mathematical Research Community: 1891-1906."

The Outer Circle: Women in the Scientific Community, edited by Harriet Zuckerman, Jonathan Cole, and John Bruer; W.W. Norton

The Triumph of Discovery by Joan Dash, Simon & Schuster Education Group, 1991 [lives and careers of four women who won the Nobel prize]

The Legislative Glass Ceiling: The 101st Congress' Record on the Women's Agenda, available from the Women's Legal Defense Fund, P.O. Box 53131, Washington, DC 20009

Women of Color in Mathematics, Science and Engineering: A Review of the Literature, 1991, available from the Center for Women Policy Studies, 2000 P St., NW, Suite 508, Washington, DC 20036

DEADLINES: 24th of January, March, May, July, September, November
AD DEADLINES: 5th of February, April, June, August, October, December
ADDRESSES: Send all Newsletter material **except ads and book review material** to Anne Leggett, Dept. of Math. Sci., Loyola Univ., 6525 N. Sheridan Rd., Chicago, IL 60626; email: aleggett@lucpul.it.luc.edu LMA24@LUCCPUA.BITNET
Send all material regarding **book reviews** to Cathy Kessel, 2803 Parker, Apt. 2, Berkeley, CA 94704.
Send everything else, **including ads**, to Patricia N. Cross, AWM, Box 178, Wellesley College, Wellesley, MA 02181. phone: (617) 237-7517 email: PCROSS@LUCY.WELLESLEY.EDU

BALLOT: Due December 1, 1991 at the Wellesley office

President-Elect:

☐ Cora Sadosky

☐ _____

Treasurer: ☐ Mary Beth Ruskai

☐ _____

Member-at-Large (vote for two):

☐ Sylvia Bozeman

☐ Mei-Chi Shaw

☐ _____

☐ _____

By-laws changes:

to 2.6: ☐ approve ☐ disapprove

to 4.2: ☐ approve ☐ disapprove

to 4.3: ☐ approve ☐ disapprove

ADVERTISEMENT GUIDELINES

AWM will accept advertisements for the AWM Newsletter for positions available, programs in any of the mathematical sciences, professional activities, and opportunities of interest to the AWM membership and other appropriate subjects. The Executive Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines

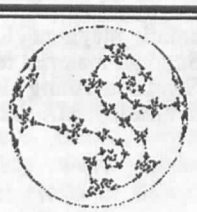
ALL INSTITUTIONS AND PROGRAMS ADVERTISING IN THE NEWSLETTER MUST BE AFFIRMATIVE ACTION/EQUAL OPPORTUNITY DESIGNATED

Institutional members receive two free ads per year. All other ads are $20 each for the first eight lines of type. Ads longer than eight lines will be an additional $15 for each lines or fraction thereof (i.e. $35 for 9-16 lines, $50 for 17-24 lines, etc.)

The preferred procedure for submission of ads is through electronic mail:
PCROSS@LUCY.WELLESLEY.EDU.
Hard copy and FAX (617-235-7361) are also acceptable.

The Geometry Center

The National Science & Technology Research Center for Computation and Visualization of Geometric Structures



The Geometry Center is based at the University of Minnesota in Minneapolis in 15,000 square feet of space overlooking the Mississippi..

The Geometry Center is looking for highly talented and motivated individuals with a strong background in mathematics or computer science. The Center has created a unified computing environment centered on math and supporting:

- math and computer science research,
- software and tool development,
- application development,
- mathematical visualization,
- video animation production, and
- high school and college math education.

Apprentices

In the past, successful apprentices have included those who wish to take time off from college to get work experience, and those who have graduated from college and want to get more experience before deciding on a future career or further graduate education. The unique Center environment reflects elements of both the corporate and academic worlds.

Based on his or her interests and the needs of the Center, an apprentice will work with senior staff or faculty on a primary project related to the areas listed above. In addition, each apprentice will assist in visitor orientation and related tasks.

The salary will be at the level of a full time graduate student, between $20,000 and $25,000/year according to background.

Postdoctoral Fellowships

Up to three fellowships will be awarded for start up to Fall, 1992. They are for one year with the possibility of a one year extension. Remuneration will be approximately $40,000/12 months if there is no other support.

Applicants will be accepted from all branches of the mathematical sciences; preference may be given to those whose work relates to current interests of the Center. A very high level of accomplishment and breadth of education is expected from the applicants and also a substantial computing background. Applicants should also be willing to supervise student assistants and otherwise participate in the education program of the Center.

Research Professorships

Application is encouraged and welcomed from those with full or partial independent funding who would like to consider residence in the intensive computer environment of the Center. A few grants may be available up to half-salary or $30,000.

Applications

To apply, please send a letter of interest including a description of your research program along with a resumé and letters of recommendation as appropriate to:

Angie Vail, Sr. Admin. Dir.
The Geometry Center
1300 South Second Street
Minneapolis, MN 55454

Please address letters of inquiry regarding research professorships to Professor Albert Marden, Director, The Geometry Center.

ADMINISTRATIVE POSITIONS

NORTHERN ARIZONA UNIVERSITY. DEPARTMENT CHAIR.

The Dept. of Math seeks a dynamic individual to lead a progressive dept. with a balanced teaching-research-service mission in a growing comprehensive university. Qualifications: PhD in an area represented in the dept. with substantial mathematics; quality university teaching, research, and professional service including leadership roles; excellent admin skills; excellent communication and interpersonal skills; recent extensive experience in a mathematics department; broad knowledge of academic mathematics, math ed and stat. Dept. of 32 permanent faculty offers programs through the master's level in mathematics, math ed, stat, and actuarial science. Faculty are active in a broad range of research areas as well as initiatives of current interest to the profession. Starting date: July 1, 1992. Send letter, vita, statement of academic philosophy; direct 4 letters of reference to: Mathematics Chair Screening Committee, College of Arts and Sciences, P.O. Box 5621 NAU, Flagstaff, AZ 86011-5621. The search will remain open until the position is filled; however, the screening committee will begin reviewing apps on Dec. 13, 1991.

DEAN, COLLEGE OF SCIENCES, UNIVERSITY OF NEW ORLEANS

The University of New Orleans, Louisiana's major urban public institution, is a comprehensive, selective-admissions university in the Louisiana State University System. Founded in 1958, it has 16,210 students, and 509 full-time and 208 part-time faculty members. UNO has six academic colleges: Business Administration, Education, Engineering, Liberal Arts, Sciences, and Urban and Public Affairs. The Graduate School has an enrollment of 3711. UNO offers bachelor's and master's degrees in 40 fields and doctorates in 13.

The College of Sciences consists of 327 faculty in seven departments: Biology, Chemistry, Computer Sciences, Geology & Geophysics, Mathematics, Physics and Psychology. All departments offer bachelor's and master's degrees, and Chemistry and Psychology offer the Ph. D. There are 2680 undergraduate majors and 326 graduate students. Grants and contracts for 1990-91 totaled $5.2 million.

The screening committee is actively seeking applications and encouraging nominations. Applicants should have 1) the leadership and vision needed to guide program development and enhance research, 2) significant administrative experience, 3) a strong record of research and commitment to teaching, and 4) the ability to promote the college effectively. Applicants should include a cover letter, curriculum vitae, and the names, addresses, and phone numbers of three references. Address correspondence to: Dr. George Ioup, Chair, Screening Committee for College of Sciences Dean, Office of Academic Affairs, Univ. of New Orleans, New Orleans, LA 70148. Review of applications will begin February 3, 1992.

UCLA Conference to honor Robert Steinberg March 24-28, 1992

Algebraic Groups and their Representations

The conference will honor Robert Steinberg for his contributions to the subject

Place: UCLA
Dates: March 24 -28, 1992

For more information contact Murray Schacher (email:mms@math.ucla.edu) or V.S. Varadarajan (email:vsv@math.ucla.edu) at the Department of Mathematics, UCLA, Los Angeles, Cal. 90024. Participation by women is strongly encouraged. Pending grant support, there will be money allocated to accomodate women and minorities.

BARUCH COLLEGE. Located in midtown Manhattan, invites apps for tenure-track position at the asst. or assoc. prof. level beginning fall 1992. A PhD in mathematics required. Additionally, quality teaching, student support and curricular development are primary concerns while scholarly publications are expected for all future promotion and tenure decisions. A proven record of excellence in teaching, curric. development, and scholarly pub. is preferable and past successful grant funding is very desirable. Apps must be received by 2/3/92. Annual workload is 21 hours which usually translates into 3 courses one semester and 2 the other. Salary range from $28,630 to $55,179, and benefit packages are competitive with most major universities. Send letter of professional aspirations and goals, resume, and 3 letters of rec. to Baruch College - CUNY, Dept of Mathematics, Search Committee, Box 509, 17 Lexington Ave., NY, NY 10010.

BOSTON COLLEGE, Mathematics Department, Chestnut Hill, MA 02167 invites applications for a tenure-track assistant professorship to begin in September, 1992. Candidates should have completed or nearly completed the Ph.D. and have strong potential and motivation in both research and undergraduate teaching. Preference will be given to applicants in probability and statistics, combinatorics and discrete mathematics, and numerical analysis, but all qualified applicants will be considered. Teaching load will be five to six courses per year. Applicants should submit a statement of professional interests and goals, a curriculum vitae, and should have at least three letters of recommendation sent. The candidate's teaching and research should be addressed in the letters. All materials should be sent to the attention of the Chair, Search Committee. To receive full consideration all application materials should be received by January 6, 1992.

BUCKNELL UNIVERSITY. Dept. of Mathematics, Lewisburg, PA 17837. Invites apps for a tenure-track position in statistics beg. fall semester 1992. Bucknell is a private, highly selective, primarily undergraduate university of about 3500 students; its broad curriculum of studies in the humanities, social sciences, and natural sciences is complimented by strong professional programs in engineering, education, and management. Several depts., including mathematics and nearly all science and engineering depts., offer master's degrees. Qualifications: PhD in statistics, strong commitment to teaching, and high potential for research. Entry-level preferred. To apply: send C.V., 3 letters of recommendation, and other supporting materials to: Sally Morrison, Chair, Dept. of Mathematics, at the address above. Letters of rec. should among them discuss both teaching and research in some detail. Apps are due Jan 24, 1992, although late responses may be considered.

CAL POLY. Tenure-track position, mathematics department. Salary commensurate with qualifications & experience; asst. prof. preferred. Duties & responsibilities include teaching mathematics courses including methods & content courses for K-12 teachers. Full description of duties and responsibilities available from Screening Committee Chair. Doctorate in Math Education & Master's Degree in Mathematics or equivalent required. Pre-college teaching experience & background in education technology desirable. Closing date: Jan. 1, 1992. For further information contact: Screening Committee Chair, Mathematics Dept., CAL POLY, San Luis Obispo, CA 93407.

CAL POLY. Lecturers, full-time, mathematics dept. Salary commensurate with qualifications & experience. Available (pending funding) for 92-93 academic year. Teaching load is 12 units per quarter plus 3 units of instructionally related responsibilities. Doctorate in Mathematics required: strong commitment to both teaching & research expected. Closing date: Jan 1, 1992. For further information or application contact: Screening Committee Chair, Mathematics Dept., CAL POLY, San Luis Obispo, CA 93407.

CAL POLY - POMONA. The Dept. of Mathematics in the College of Science invites apps and nominations for the position of Chair of the Mathematics Dept. Doctorate in Mathematics, Statistics, Math Education or equivalent degree. Record of successful administrative, teaching and scholarly research required. Evidence of commitment to promoting teaching, research, and other scholarly activities. Apps, resume, transcripts, and 3 current letters of reference to be receive by 1/15/92. For additional information or to apply contact: Search Committee, Mathematics Dept., California Polytechnic University, 3801 W. Temple Ave., Pomona, CA 91768-4033. (714)869-3467.

CAL STATE, FULLERTON, Dept. of Mathematics is offering a tenure-track position at the Assistant or Associate Professor level starting in Fall 1992. Rank and salary will be determined by the qualifications of the successful applicant. Candidates must possess a PhD in Mathematics, strong teaching references, and show evidence of a commitment to continuing research in the following areas listed in order of preference: Numerical Analysis, Discrete Mathematics, or Partial Differential Equations. A letter of application, curr. vita and three letters of reference should be sent to: Chair of Selection Committee, Dept. of Mathematics, California State University, Fullerton, CA 92634. To guarantee consideration for this position, all application documents should be received by Feb 21, 1992.

CAL STATE, FULLERTON, Dept. of Mathematics is offering a tenure-track position at the Assistant or Associate Professor level starting in Fall 1992. Rank and salary will be determined by the qualifications of the successful applicant. Candidates must possess a Master's Degree in Mathematics and a Doctorate in Mathematics or Mathematics Education. Candidates should also have experience teaching at the K-8 level. Additional requirements include strong teaching references and evidence of a commitment to continuing research in Mathematics Education. A letter of application, curr. vita and three letters of reference should be sent to: Chair of Selection Committee, Dept. of Mathematics, California State University, Fullerton, CA 92634. To guarantee consideration for this position, all application documents should be received by Feb 21, 1992

CENTRAL MISSOURI STATE UNIVERSITY. Dept. of Math & Computer Science. Apps are invited for several tenure-track and non-tenure-track positions beginning in Aug. 92. One position in statistics/ actuarial science. A PhD in math or stat preferred. Assoc. or Fellow in the Society of Actuaries with a masters degree will be considered. Training in stat with an interest in actuarial science is required. One position in mathematics. A PhD in math, math ed, stat, or computer science is preferred. Possible non-tenure-track positions. A masters degree in a mathematically related area required. the dept. offers bachelors degree programs in math, math ed, computer science, and actuarial science and a masters degree program in math. Normal teaching assignment is 12 hours of undergrad and/or grad courses per semester. A reduced load for research possible. Salary is competitive. Application letter, resume, transcripts, and 3 professional references should be sent to: Dr. Ed Davenport, Dept. of Math & Computer Science, Central MO State University, Warrensburg, MO 64093. Screening will begin Jan 15, 1992. Apps will be considered until positions filled.

CUNY/ College of Staten Island, Dept. of Mathematics. A tenure-track position in mathematics is available for fall 1992. Requirements: PhD, strong commitment to undergraduate teaching and to a productive research program. All mathematics research areas will be considered with special preference given to areas of strength within the department. These areas include probability, group theory, and applied mathematics. Rank: Assistant Professor. Salary range: $34,125-$46,176. CSI is a senior college in CUNY. Send curriculum vitae and names and addresses of three references by January 15, 1992 to: Dr. Jane Coffee, Chairperson, Dept. of Mathematics, College of Staten Island/CUNY, 130 Stuyvesant Place, Staten Island, NY 10301.

COLLEGE OF THE HOLY CROSS. One tenure track position beginning Sept. 1992 for a PhD mathematician interested in teaching at a liberal arts college. Teaching load is 3 courses each semester. One tenure track position for a PhD computer scientist or for a PhD mathematician with at least a master's degree in computer beginning Sept. 1992 interested in teaching courses in a concentration in c.s. within the math program. Teaching load is 3 courses per semester. Candidates for these positions should have a strong commitment to teaching and to research. Application, consisting of resume, undergrad and grad transcripts, and 3 letters of rec evaluating teaching and scholarship, should be sent to: Melvin C. Tews, Chair, Dept. of Math, College of the Holy Cross, Worcester, MA 01610.

DARTMOUTH COLLEGE. John Wesley young Research Instructorship, 2-yrs., new or recent PhD's whose research overlaps dept. member's. Teach 4 ten-week courses spread over 2 or 3 quarters. $34,000 for nine months; $7,556 summer research stipend. Send application letter, resume, research/thesis description, graduate transcript, and 3 (prefer 4) references (1 discussing teaching) to Phyllis A. Bellmore, Mathematics and CS, Dartmouth College, 6188 Bradley Hall, Hanover, NH, 03755-3551. Files complete Jan. 15 considered first.

DAVIDSON COLLEGE. Applications are invited for a tenure track position in the Mathematics Department beginning August 1992. Completion or near completion of PhD is required. A candidate must be committed to outstanding teaching and continuing scholarly activity. Some computer science background is desirable. Teaching load will average 5.5 courses per year. Davidson is a liberal arts college with a Presbyterian heritage. Applications consisting of a statement of professional aspirations and goals, resume, graduate and undergraduate transcripts, and 3 letters of reference (at least one about teaching) should be sent to the attention of Prof. L. R. King, Chair, Department of Mathematics, P. O. Box 1719, Davidson, NC 28036. (Email: MATH@DAVIDSON.BITNET) Applications received by November 29, 1991 will receive first consideration.

DUKE UNIVERSITY. Department of Mathematics. Applications are invited for a tenure track Assistant Professorship in Mathematics, salary open, all fields, starting September 1, 1992. Applicants should send a curriculum vitae, a research plan, and should arrange for three letters of recommendation to be sent. A teaching recommendation is also strongly suggested. Complete applications received by January 15, 1992 will be guaranteed full consideration. Address correspondence to: Faculty Search Committee, Department of Mathematics, Duke University, Durham, NC 27706.

FAIRFIELD UNIVERSITY. Dept. of Math & Computer Science. Asst. Prof. Math; tenure-track; 9 hours teaching per week plus research; start 9/92; PhD in Math required with teaching competence in Statistics desirable. Salary competitive; full consideration until 2/1/92. Vitae and 3 letters of reference to: Joseph B. Dennin, Chair of Dept., Fairfield University, North Benson Road, Fairfield, CT 06430-7524. Fairfield is a Jesuit University, 60 minutes from New York City.

FROSTBURG STATE UNIVERSITY. Dept. of Mathematics. 2 full-time, tenure track, Instructor/Asst. Prof positions available Fall 92, SUBJECT TO FINAL FUNDING APPROVAL. Teach 12 credits introductory level mathematics per semester and share departmental responsibilities. Required: Master's degree in math, strong commitment to undergrad teaching and continuing interest in mathematical development. Preferred: PhD in math or math ed, teaching experience, experience with applications of mathematics and interest in applications of technology to classroom teaching. Salary range $25,000-$30,000 plus benefits package afforded Univ of Maryland system employees. Direct questions to Dr. Richard C. Weimer, Dept. Chair, 301-689-4377. Send letter of interest, resume, transcripts and 3 letters of recommendation, not later than Jan 15, 1992, to: Mr. C. Douglas Schmidt, Dir. of Personnel Services, Frostburg State University, Frostburg, MD 21532.

GUSTAVUS ADOLPHUS COLLEGE. Tenure-track position beginning Sept. 1992. PhD in math stat., stat expected. Ability to build stat. track in math/cs program, commitment to excellence in teaching, continuing research interests in stats, operations research, or modeling, some cs preferred. Send c.v., transcripts, 3 letters of reference by January 31, 1992 to: Dr. T.J. Morrison, Chair Math/CS, Gustavus Adolphus College, St. Peter, MN 56082. Telephone: (507) 933-7483 or 933-7009. E-mail: TJ@GACVAX2.BITNET or TJM@BANCH.GAC.EDU

HAMILTON COLLEGE. 198 College Hill Road, CLinton, NY 13323. Dept of Math and C.S invites apps for a tenure track position in Computer Science. The CS concentration follows closely the model curric. for a liberal arts environment, and offers numerous opportunities for innovation in course design and teaching, for conducting research that supports teaching, and for supervising student research. Duties include teaching 5 courses per year at a small, highly selective liberal arts college. Benefits are many, including a generous leave policy. A PhD is required; interest and excellence in teaching are expected. To apply, send c.v. and 3 letters of reference (at least 1 describing teaching experience) to Richard Bedient, Chair (phone: 315-859-4138).

ILLINOIS STATE UNIVERSITY. The Department of Mathematics at ISU invites apps for the position of Chairperson at rank of Professor. Qualifications: Applicants must have a doctorate in Mathematics or Mathematics Education and a solid record of acheivement in research, teaching and leadership. They must have demonstrated effective administrative skills. Experience with undergraduate and graduate programs is desirable. The salary is competeitive. Duties begin on or about 8/1/92. The ISU Department of Mathematics has 44 fulltime positions and offers undergraduate, master's and doctoral programs (Doctor of Arts in Mathematics and PhD in Mathematical Education). Current faculty research interests include various areas of mathematics, applied mathematics, statistics, and mathematical education. The Department serves ocer 400 students each semester. To ensure consideration applicants should send c.v., graduate transcript(s), and names and addresses of at leasts 3 refereences to Dr. Robert Corbett, Secretary, Mathematics Chair Search Committee, Dept of Geography-Geology, ISU, Normal, ILL 61761, before 2/14/92.

INDIANA UNIVERSITY-PURDUE UNIVERSITY AT INDIANAPOLIS (IUPUI), Dept. of Math. Sci. is seeking applicants for three tenure-track positions to begin in August 1992. Rank is open depending on qualification. Applicants must have an earned doctorate by the starting date, either a strong research record or excellent research potential, and a commitment to quality graduate and undergraduate teaching. Some preference may be given to applicants in discrete mathematics, scientific computing, and applied statistics. However, strong applicants form all area of mathematical sciences are encouraged to apply. The University offers competitive salaries and provides excellent fringe benefits. Send resume and three letters of recommendation to Prof. Bart S. Ng, Chair, Dept. of Mathematical Sciences, IUPUI, 1125 E. 38th St. Indianapolis, IN 46205-2810. Closing date: January 15, 1992. Late application will be considered until positions are filled.

INDIANA UNIVERSITY AT SOUTH BEND. Apps are invited for one or more tenure track positions in mathematics at the asst. prof. level with a starting date of August, 1992. Apps must have completed requirements for PhD in math by August, 1992. The Dept. currently has 15 full-time faculty. Math students may graduate with a Bachelor of Arts Degree in Math or a Bachelor of Science Degree in Applied Math. The regular teaching load at IUSB is 9 credit hours. Salaries are competitive and the fringe benefits package is excellent. Send vita and arrange for 3 letters of rec. be sent to: William J. Frascella, Chair, Dept. of Math and CS, Indian University at South Bend, South Bend, IN 46634. Completed apps received by 1/31/92 will be given full consideration.

IOWA STATE UNIVERSITY. Dept. of Math. Subject to availability of funds, Dept. of Math expects to fill one tenure track position at the asst. prof level in applied differential equations for 92-93 academic year. Start up funds available for the successful applicant. The successful candidate expected to have a strong interest in teaching at both grad and undergrad level and maintain an active research program. Iowa State is the closest member institution to the NSF Inst. for Mathematics and its Applications in Minneapolis. The Dept. strongly encourages its faculty and grad students to participate in the Institute's programs and provides direct and indirect support for them to do so. Screening will begin Jan. 15, 1992. However, applications will be accepted until position is filled. A number of visiting positions in diverse areas of math and applied math are expected to be available and apps for them are also encouraged. Preference will be given to those applicants whose interests are similar to those of current faculty. Apps and 3 letters of rec should be sent to: Howard A. Levine, Chair, Dept. of Math, Iowa State University, Ames, Iowa 50011.

JOHNS HOPKINS UNIVERSITY, Dept. of Math. Sciences invites applications for a faculty position in Operations Research or Optimization to begin in Fall 1992. Within these areas, either a stochastic or a deterministic emphasis is of interest. Applicants at all levels will be considered. Selection is based on demonstration and promise of excellence in research, teaching, and innovative application. Applicants are asked to furnish a curriculum vitae, transcripts (junior applicants only), reprints (if available), a letter describing professional interests and aspirations, and to arrange for three letters of recommendation to be sent to: John C. Wierman, Chair, Dept. of Math. Sci., 220 Maryland Hall, Johns Hopkins University, Baltimore, MD 21218-2689.

JOHNS HOPKINS UNIVERSITY, Dept. of Mathematics, Applications are invited for a position beginning Fall 1992 at the Associate or Assistant Professor level in partial differential equations or related areas. Outstanding research accomplishments and commitment to teaching are required. Applications will be considered from candidates who have received a PhD in mathematics prior to 12/89. Apps and recommendation letters should be sent to: PDE Search Committee, Dept. of Mathematics, Johns Hopkins University, Baltimore, MD 21218.

KANSAS STATE UNIVERSITY, Dept. of Math. Subject to budgetary approval, apps invited for several tenure-track positions commencing August 18, 1992; rank and salary commensurate with qualifications. All fields will be considered, but for some of the tenure-track positions, preference will be given to candidates in Numerical Analysis, Differential Equations, and Global Analysis. Applicants must have strong research credentials and a commitment to excellence in teaching. A PhD in mathematics or a PhD dissertation accepted with only formalities to be completed is required. Letter of app, current vita, description of research and three letters of recommendation should be sent to: Louis Pigno, Dept. of Mathematics, Cardwell Hall 137, Kansas State University, Manhattan, KS 66506. Deadline: Feb. 1, 1992.

LOYOLA MARYMOUNT UNIVERSITY. Dept. of Mathematics, Los Angeles, CA 90045. Apps are invited for an anticipated tenure track faculty position starting Fall '92. PhD in math required. There are no restrictions as to areas of specialization. Teaching load is 9 hours per semester. Evidence of continued scholarship also required. Opportunity to teach a wide variety of undergrad courses. Send resume and 3 letters of rec. (at least one on teaching) to Dr. Connie Weeks, Chair, Hiring Committee. In a cover letter please indicate if you will attend the AMS/MAA annual meeting in Baltimore. Apps will be accepted through 2/15/92 or until potential vacancy is filled. the availability of this position is subject to a vacancy occurring in the department.

MACALESTER COLLEGE, Mathematics/Computer Science, St. Paul, MN 55105. Applications are invited for a tenure track position in Mathematics to begin in the fall of 1992. Candidates must have the PhD, and a strong commitment to teaching and research in an undergraduate liberal arts college. Located in a pleasant residential neighborhood of the culturally rich Twin Cities of St. Paul and Minneapolis, Macalester has a student body of 1750, 11% of whom are international and 10% of whom are American minorities, reflecting a long-standing desire to maintain a multi-national, multi-ethnic community. Part of a strong science program, the Math and CS Department has the largest total course enrollments on campus. Applicants should send a resume and a statement giving reasons for interest in a liberal arts college having no graduate program; also arrange for three letters of reference to be sent to Wayne Roberts at the address above. Evaluation of applications will begin on November 1 and will continue until the position is filled.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. The Department of Mathematics may make several appointments at the Asst. Prof. level in pure mathematics for the year 1992-93. The teaching load will be 6 hrs per week in one semester and 3 hrs per week in the other, or other combinations totaling 9 hrs. Open to mathematicians with doctorates who show definite promise in research. Apps please send c.v, a description of your thesis, and the research you plan for next year to: Pure Mathematics Committee, MIT, Room 2-263, Cambridge, MA 02139-4307.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. At least 2 asst. professorships in applied math will probabaly become available in fall '92 for persons typically about 2 yrs beyond their doctorates. This time we are looking especially, though not exclusively, for unusual new talent in the areas of dynamics, numerical analysis, and/or the theory of algorithms. For further information, write to: Committee on Applied Mathematics, Room 2-345, Dept. of Math, MIT, Cambridge, MA 02139-4307.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. C.L.E. Mooore Instructorships in Mathematics, open to mathematicians with doctorates who show definite promise in research. Teaching loads are 6 hrs. per week during one semster and 3 hrs. per week during the other, in order that the appointees may have ample time for research. Please send c.v., description of the research in your thesis, and the research which you plan for next year to: Pure Mathematics Committee, MIT, Room 2-263, Cambridge, MA 02139-4307.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY. A limited number of instructorships in applied mathematics are available for recent PhD's. Appointments will be made on the basis of superior reseach potential. Applications should be completed by 2/15/92, and our decisions will be announced in the early spring. For further info. write to: Committee on Applied Mathematics, Room 2-345, Dept. of Mathematics, MIT, Cambridge, MA, 02139-4307,

MICHIGAN STATE UNIVERSITY. Dept of Statistics & Probability. The Dept has a tenure track asst. professorship available August 16, 1992. Candidates should have a PhD in the field of stat and/or prob. and a strong research and teaching potential. Please have a C.V. and 3 letters sent to: Professor Habib Salehi, Chairperson, Dept. of Stat & Probability, A 415 Wells Hall, Michigan State University, East Lansing, MI 48824-1027. The selections process will begin 1/1/92 and continue until position is filled.

MICHIGAN STATE UNIVERSITY. Dept. of Mathematics. The Dept. is seeking apps for several tenure track positions; opening are available at each of the asst., assoc., and full prof levels. Excellence in research and teaching essential and apps in all areas or research will be considered. Please send resume and arrange to have 3 letters of rec sent to: Professor Richard E. Phillips, Chair, Dept. of Mathematics, Michigan State University, East Lansing, MI 48824-1027: E-mail 21144CHR@MSU.BITNET. It would help if resume includes appropriate Mathematics Subject Classification number(s) and (if possible) electronic address. Apps receive by 1/4/92 will be given more attention.

MICHIGAN TECHNOLOGICAL UNIVERSITY. The Mathematical Sciences Department at MTU is seeking apps. for a ten. track pos. beginning 9/92. Apps should have a PhD or EdD in Mathematical Education with a strong background in Mathematics. The successful candididate is expected to have sufficient background in Math to teach such courses as geom., calc. and other selected undergraduate math courses; and a sufficient background in Educ. to teach such sourses as math methods, computers in education, and measurement and evaluation. Candidates should have teaching exp. at the secondary level (7-12). A commitment to quality teaching and to the development of an active research program in math ed. is necessary. Send c.v., transcript, and 3 letters of rec. to A.H. Baartmans, Head, Dept. of Mathematical Sciences, MTU, 1400 Townsend Drive, Houghton, MI 49931-1295. Apps. will be accepted until 2/3/92.

MILLERSVILLE UNIVERSITY. Dept. of Math. FT tenure-track asst. prof. to begin 8/92, in a dept. of 20 faculty and over 225 math majors. Primary duties: leadership in developmental mathematics, diagnostic techniques, remediation delivery packages, teaching and placement, teaching through calculus, advisement curriculum development, committees, and scholarly growth. Twelve-hour load per semester. Doctoral degree (or expected completion within one year) in mathematics, math education, or curriculum and instruction with a mathematics background at least through the master's level. Must exhibit evidence in teaching developmental mathematics, relate well with developmental students and the wider university community, and be an effective teacher of math through calculus. Experience in pre-university or urban teaching preferred. Excellent salary-benefits. Full consideration will be given to applications received by 2/1/92. Send letter of application, vita, copies of transcripts and three letters of reference (at least two which attest to your teaching effectiveness) to: Prof. Marshall Anderson, Staff Search Committee Chair, Dept. of Mathematics, WM1191 Millersville Univ., Millersville, PA 17551

MILLS COLLEGE. Dept. of Mathematics & Computer Science, Oakland, CA 94613. Mills College is seeking outstanding candidates for 2 tenure-track positions, commencing Fall 1992. The first is Asst. Prof of Computer Science. PhD in CS is required. The second is Asst. Prof of the Interdisciplinary Computer Science Master's Degree Program. A strong computer science background, PhD in a related field, and the ability to guide students, with quite diverse backgrounds, in a master's degree program are required. Candidates for both positions must submit evidence of superior teaching and research abilities. Salary will depend on experience and qualifications. Initial contract will be for 3 years, subject to final admin approval. Please submit c.v., and direct 3 letters of reference to the Dept Chair at the above address. Deadline for apps is 1/10/92.

MUHLENBERG COLLEGE, Dept. of Mathematics, seeks nominations or apps. for a tenure track prof. beginning in Aug., 1992. Apps. must have a doctorate in the mathematic sciences, and a minimum of 5 yrs. teaching experience on the college/univ. level, a publication record, and demonstrable competence in undergraduate teaching and student research/independent study. Muhlenberg College is an independent, undergraduate, coeducational institution, located in Allentown, Pennsylvania, in the mountains, approximately 55 miles north of Philadelphia and 90 miles west of New York City. Please address all inquires, nominations or apps.(including a letter of app., a resume, and the names of 3 references) to Dr. John Meyer, Head, Dept. of Mathematics, Muhlenberg College, Allentown, PA 18104. The possibility of preliminary interviews at the Baltimore meetings.

NEW MEXICO STATE UNIVERSITY. Dept. of Mathematical Sciences, Las Cruces, NM 88003. Dept. invites apps for possible visiting and tenure track positions in pure and applied math and stat for academic year 92-93. New tenure track positions will be primarily at the asst. prof. level, but appts. at a higher rank may be possible. Strong commitment to both research and teaching required. Dept. has 32 tenure track faculty and offers BS, MS, and PhD degrees. Apps are kept on file through hiring period and positions filled as opening occur. Arrange for vita, short research description, and at least 3 ref letters to be sent to: Hiring Committee, Dept. of Math Sci, New Mexico State University, Las Cruces, NM 88003.

NORTH CAROLINA STATE UNIVERSITY, Dept. of Statistics. Assistant/ Associate Professor of Biomathematics (tenure track). Research strength expected in mathematical biology, either in mathematical theory or in applications. Duties include research, teaching, and graduate student direction. Special attention will be given to candidates whose appointment would increase the diversity of faculty research in the Biomathematics program. The successful candidate will be expected to establish a significant, externally funded, research program. Letter of application, CV (including transcript or list of graduate courses for recent graduates), and 3 letters of reference should be sent by February 1, 1992 to Faculty Search Committee, Biomathematics Graduate Program, North Carolina University, Campus Box 8203, Raleigh NC 27695-8203.

NORTHERN ARIZONA UNIVERSITY. Apps are invited for 3 tenure track openings beginning Fall 1992. 1. Asst. Prof, Ordinary Differential Equations (geometric theory of dynamical systems, planar systems with polynomial right hand sides, bifurcation theory). 2. Asst. Prof, Mathematical Statistics. Both require PhD in the area, substantial evidence of high quality teaching, and demonstrated potential for a productive, quality research program. 3. Professor, Mathematics Education., requiring commensurate professional accomplishments and leadership experience. Send letter and vita: direct 3 letters of reference to: Mathematics Screening Committee, P.O. Box 5717, NAU, Flagstaff, AZ 86011-5717. The searches will remain open until positions filled; however, screening committee will begin reviewing apps on 1/3/92.

NORTHWESTERN UNIVERSITY. Mathematics Dept., 2033 Sheridan Road, Evanston, IL 60208-2730. Math Dept. will sponsor an Emphasis Year in partial differential equations. This program will include 2-year Asst. Professorship positions starting Sept. 1992, and possible visiting positions for one or more senior mathematicians for part or all of the academic year. Apps should be sent to Prof. Neil S. Trudinger at the dept address and include a c.v. and 3 letters of rec. In order to ensure full consideration, an app must be received by 2/15/92.

THE OHIO STATE UNIVERSITY. Dept. of Math hopes to have available several positions, both visiting and permanent, effective Autumn Quarter 1992. Candidates in all areas of applied and pure math, including those with demonstrated interest in pedagogical matters, are invited to apply. Significant math research accomplishments or exceptional promise, and evidence of good teaching ability, will be expected of successful applicants. Send credentials and have letters of recommendation sent to Prof. Dijen Ray-Chaudhuri, Dept. of Math, The Ohio Sate University, 18th Ave, Columbus, OH 43210. Review of resumes will begin immediately.

THE OHIO STATE UNIVERSITY. Math Dept. hopes to have available a few research instructor positions for the academic year 92-93. Candidates should hold a PhD (or equivalent) in mathematics and show strong research promise. Send credentials and have letters of recommendation sent to Prof. Dijen Ray-Chaudhuri, Dept. of Math, The Ohio Sate University, 18th Ave, Columbus, OH 43210.

OHIO WESLEYAN UNIVERSITY. Dept. of Mathematical Sciences invites apps for tenure track Asst. Prof. level position beginning Fall '92. Apps should have a PhD in math with interest in computing science. Preference will be given candidates specializing in algebra or discrete math. Seeks a person who will play an active role in bringing technology into the instruction of math. Successful candidate will teach mostly undergrad math with some c.s. Teaching load is 3 courses per semester and classes typically meet 3 hours a week. Dept. has about 20 senior math majors per year, many of whom go to grad school in math sciences. Dept of Math Sci has 7 full-time faculty. Computing facilities are up-to-date. Apps close 2/28/92. Send cover letter, resume, official grad and undergrad transcripts, and three letters of reference to: Prof. David L. Hull, Chair, Dept. of Math Sci, Ohio Wesleyan University, Delaware, OH 43015.

PENN STATE UNIVERSITY-ERIE, THE BEHREND COLLEGE. Apps are invited for a ten. track faculty position at the Asst. Prof. level to teach baccalaureate level mathematics and statistics courses starting Fall Semester 1992. PhD in Math., Stats., or related area required; prev. teaching exp. and substantial coursework in stats. preferred. Applicants should have an interest in undergraduate teaching and the ability to produce publishable research. Penn State-Behrend is one of the two 4 yr and grad campuses in the 22 campus Penn State system. The Div. of Science, Engineering and Technology has 57 full-time faculty in bio, chem, c.s., eng. geoscience, math and physics; it offers assoc. and bac. programs, including a Math major. Erie is an attractive renascent city of about 250,000 on the Pennsylvania shore of Lake Erie, approx. 2 hrs from Pittsburgh, Cleveland and Buffalo. There are abundant cultural and recreational opportunities and housing costs are quite reasonable. Penn-State Behrend has an esp. beautiful 600 acre cmapus. App. deadline is 1/1/92, or until a suitable app is identified. A detailed resume, names of 3 references, and official transcripts should be sent to Dr. Allen H. Pulsifer, Head, Div. of Science, Engineering and Technology, Dept. AS-MATH5, PSU, Station Road, Erie, PA 16563-0203.

QUEEN'S UNIVERSITY AT KINGSTON The mathematics and statistics department will be making an appointment in a renewable (tenure track) position at the assistant professor level, to begin July 1992. Applications are invited in the areas of Statistics, Numerical Analysis and Applied Mathematics. In the case of an application in the area of Applied Mathematics, membership or eligibility for membership in a Canadian professional engineering association is required. The successful applicant will have excellent research promise and a demonstrated potential to give leadership in promoting scholarly activities within the department. Salary will be commensurate with qualifications and experience. Interested candidates are requested to arrange that a curriculum vitae and letters of recommendation from three or more referees be received at the address below by February 1, 1992. At least one letter should comment on the candidate's teaching ability. Professor Leo B. Jonker, Head, Department of Mathematics & Statistics, Queen's University, Kingston, Ontario K7L 3N6. In accordance with Canadian Immigration requirements, this advertisement is directed to Canadian citizens and permanent residents. Queen's University has an employment equity program and encourages applications from all qualified candidates, including women, aboriginal peoples, people with disabilities and visible minorities. Queen's University is willing to help the spouse of a new appointee seek suitable employment. FAX: 613-545-2964 BITNET: MASTDEPT@QUCDN

RENSSELAER POLYTECHNIC INSTITUTE, Troy, NY 12180, Mathematical Sciences Dept. (JG Ecker, Chair). Applicants are invited for tenure-track positions starting in Sept. 1992 at all levels in areas of applied mathematics, including scientific computation and optimization. PhD with strong research and teaching potential required for junior level appointments and demonstrated outstanding record required for senior level appointments.

RICE UNIVERSITY. Apps are invited for a tenure-track asst. Prof. There is a possibility of an upgrade to associate or full prof. for an exceptional senior candidate. Candidates must have an extremely strong research background and good teaching skills. Preference will be given to apps. in geometric topology, geometric analysis, partial differential equations, and algebraic geometry. Please send a curriculum vitae and at least 3 letters of recommendation to: Appointments Committee, Dept. of Mathematics, Rice University, P.O.Box 1892, Houston, TX 77251. Applications received by 12/31/91 will be assure full consideration.

RICE UNIVERSITY. Griffith Conrad Evans Instructorships. Postdoctoral appointments for 2-3 yrs for promising research mathematicians with research interests in common with the active research areas at Rice, particularly geometric topology, geometric analysis, differential geometry, mathematical physics and ergodic theory. Apps received by 12/31/91 will receive full consideration. Rice Univ. is an Equal Opportunity/Affirmative Action Employer and strongly encourages apps. from women and minority group members. Inquires and apps. should be addressed to Chair, Evans Committee, Dept. of Mathematics, Rice Univ., P.O. Box 1892, Houston, TX 77251-1892.

SLIPPERY ROCK UNIVERSITY. Tenure track, full-time position available beginning fall semester, 1992. Faculty rank negotiable. Duties include teaching an avg. of 12 semester hrs. participating in dept. activities. PH.D. in mathematics and college mathematics teaching experience required. Minorities and women are especially encouraged to apply. Send letter of application, resume, transcript and 3 current letters of recommendation to: Search Committee, Chairperson, Mathematics Dept., Slippery Rock Univ., Slippery Rock, PA 16057. To ensure consideration, application materials should be received by 1/31/92. Apps. will be accepted until the position is filled.

RUTGERS UNIVERSITY, Dept. of Mathematics invites applications for the following open positions beginning September 1992. (1) TENURE-TRACK AND TENURE POSITIONS. Most appointments are expected to be to tenure-track assistant professorships. However, depending on qualifications of the applicant, some appointments may be made to tenured positions at the rank of associate professor or higher. Candidates must have Ph.D., outstanding research ability in pure or applied mathematics and concern for teaching. Semester course load now averages 5 hours. Strong candidates in all fields are encouraged to apply and will be given careful consideration. (2) HILL ASSISTANT PROFESSORSHIPS. The Hill Assistant Professorships are three-year non-renewable positions. Candidates should have recently received the Ph.D., show outstanding promise in research ability in pure or applied mathematics, and have concern for teaching. Semester course load is approximately 6 hours but a one course per year teaching reduction is provided in two of the three years. Applicants should send resume and at least three letters of recommendation to the SEARCH COMMITTEE, Department of Mathematics, Rutgers University, New Brunswick, NJ 08903 as soon as possible. Please indicate the position desired and give the AMS Subject Classification number of your area(s) of specialization. Applicants who applied in 1990-91 may, if they wish, request to have their previous application reactivated and submit only such new materials as they choose.

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE. Apps. are invited from qualified candidates for a tenure-track position at the asst. prof. level beginning on 8/16/92. PH.D. in mathematics with specialization in numerical analysis required. Candidates must have demonstrated excellence in research or potential for such. Evidence of teaching effectiveness is required(foreign apps. must provide evidence of ability to teach in English effectively.) Send letter of app.,resume, and 3 letters of recommendation to: Numerical Analysis, C/O Ronald B. Kirk, Chair, Dept. of Mathematics, Southern Illinois Univ. at Carbondale, Carbondale, Illinois 62901. The closing date for apps. is 12/10/91 or until the position is filled.

STATE UNIVERSITY OF NEW YORK AT BINGHAMTON. Department of Mathematical Sciences invites applications for an assistant professorship (pending funding) in statistics/probability. Applicants must show great research promise. The department has a healthy doctoral program and an attractive future. Vita and letters of recommendation should be sent to: David L. Hanson, Chair; Dept. of Math. Sciences; SUNY-Binghamton; Binghamton, NY 13902-6000. Screening of applications will begin on December 1, 1991 and continue until the position is filled.

STATE UNIVERSITY OF NEW YORK AT BUFFALO, The Dept. of Mathematics anticipates the appointment of several tenured or tenure-track faculty members beginning 9/1/92. Salary will be competitive. We seek apps. in all areas with excellent research accomplishments/potential and a strong commitment to teaching. Apps. should send supporting info, including their relevant primary and secondary AMS subject classification numbers, and have 4 letters of recommendation sent to: Dr. Lewis A. Coburn, Search Committee Chairman, Dept. of Mathematics, SUNY/Buffalo, 106 Diefendorf Hall, Buffalo, NY 14214. The deadline for apps. is 12/1/91. Late apps. will be considered until positions are filled.

SYRACUSE UNIVERSITY, Dept. of Mathematics, Box 1, Syracuse, NY 13244-1150. Two positions may be available in the area of mathematics education at open ranks beginning Fall 1992. Candidates should have outstanding research ability and evidence of excellence in teaching. Responsibilities include: Teaching and advising undergraduate and graduate (MS and PhD) students in mathematics education; directing and conducting research in problems of curriculum, learning and teaching. We have particular interest in the application of technology to these areas. Send a letter of application and vita with a list of publications, and have three letters of reference sent to Philip T. Church, Search Committee Chair.

TEXAS TECH UNIVERSITY, Dept. of Math., PO Box 41042, Lubbock, TX 79409-1042 anticipates openings for at least two tenure track Assistant Professorships beginning in the gall semester of 1992. In at least one of these positions, special consideration will be given to applicants in applied and computational mathematics. To qualify the applicants must: 1) have a PhD, 2) have a strong dedication to both teaching and research, 3) exhibit research interest that are compatible with ongoing programs in the dept., and 4) be willing and able to work with students at both the undergraduate and graduate level. To apply please send a resume and have three letters of recommendation sent to: Harold Bennett, Chairman of Hiring Committee, at the above address.

UNION COLLEGE, Mathematics Dept., Schenectady, NY 12308. Three year Visiting Assistant Professorship starting September, 1992. All fields considered. Excellence in teaching and strong research potential required. (Institutional support is quite balanced between teaching and research.) Experience with computer applications to teaching mathematics is desired but not necessary. Union's academic computer facilities include a cluster of 4 Vaxs, student Mac and PC rooms, and graphic labs; every math faculty office has a Mac SE/30, II, or IIci, each equipped with Mathematica. The teaching load is 5 courses per year typically split 2-2-1 over our three 10 week terms. Send vita and three letters of reference - at least one of which discusses teaching qualifications -to Search Committee Chair, at the address above. For full consideration, respond by December 15.

UNIVERSITY OF ALABAMA at Birmingham, Dept. of Mathematics. Apps are invited for tenure-track positions at all levels to begin Sept. '92. Apps for junior level position should have strong research potential as well as a commitment to teaching undergrad and grad students. Apps with post-doctoral experience are especially welcome. Apps for senior level positions with tenure should have an exceptional record in research including research grants and a record of good teaching. Pref will be given to candidates whose research is compatible with that of current faculty: this includes dynamical systems, diff. geometry, mathematical physics, nonlinear analysis, partial diff equations including numerical p.d.e., and topological dynamics. To apply please send a c.v., selected reprints, and at least 3 letters of ref. Senior apps may request that the Search Committee contact references - please make that clear on the cover letter. Send apps to: Search Comm, Dept. of Mathematics, U of Alabama at Birmingham, Birmingham, AL 35294-2060.

UNIVERSITY OF ALABAMA in Huntsville, Dept. of Mathematical Sciences. Apps are invited for 2 or more tenure-track faculty positions beginning Sept. '92. Rank and salary depend on credentials of appointee. PhD in mathematics or related field with emphasis in applied mathematics, evidence of good teaching skills, and excellent research ability are essential. Preferred specialty areas include numerical analysis, discrete mathematics, mathematical modeling, fluid dynamics, diff. equations, and probablity/statistics. Send letter of application, vita, and 3 letters of reference to Peter M. Gibson, Chairman, Mathematical Sciences Dept. U. of Alabama, in HUntsville, Huntsville, AL 35899. Review of Apps will begin 2/3/92 and will continue until all positions are filled.

UNIVERSITY OF ARIZONA, Dept. of Mathematics, is happy to announce several positions which will be available beginning Fall 1992. Tenure track positions: Excellent research record or potential, strong commitment to teach required. Fields should complement but not duplicate existing dept. research strengths in algebra, arithmetic geometry, computational science, differential equations, dynamical systems, fluid mechanics, differential geometry, mathematical physics, nonlinear analysis, nonlinear science, number theory, and probability. Postdoctoral Fellowships(Research Associate). Apps. with strength in all areas compatible with dept. interests are encouraged to respond. In addition, special Center of Excellence Awards in nonlinear optics and fluid mechanics are available. The Mathematics Dept. will also have several visiting positions for next yr. We encourage early apps. Deadline date will be 12/15/91 or whenever positions are filled. Send apps. which should include a letter of interest, curriculum vitae with a list of publications, and a minimum of 3 letters of recommendation (enclose or arranged to be sent), to: Alan C. Newell, Chairman, Personnel Committee, Dept. of Mathematics, Univ. of Arizona, Tucson, Arizona 85721, USA.

UNIVERSITY OF CALIFORNIA AT BERKELEY, Dept. of Mathematics, Berkeley, CA 94720. invites application for one or more positions effective July 1, 1992, at tenure level (Associate or full Professor) subject to budgetary approval in the areas of algebra, analysis, applied mathematics, foundation, or geometry and topology. Demonstrated leadership in research is expected of applicants. Applicants should send a curriculum vitae, list of publications, a few selected reprints or preprints, and the names of three references to the Vice Chair for Faculty Affairs are the above address. We should receive this material no later than Jan. 15, 1992.

UNIVERSITY OF CALIFORNIA AT BERKELEY, Dept. of Mathematics invites application for one or more positions effective July 1, 1992, at tenure-track Assistant Professor level, subject to budgetary approval in the areas of algebra, analysis, applied mathematics, foundation, or geometry and topology. Applicants are expected to have demonstrated outstanding research potential, normally including major contributions beyond the doctoral dissertation. Applicants should send a resume, and reprints or preprints, and/or dissertation abstract, and ask 3 people to send letters of recommendation to the Vice Chair for Faculty Affairs ar the above address. We should receive this material no later than Jan. 15, 1992.

UNIVERSITY OF CALIFORNIA AT BERKELEY, Dept. of Mathematics, Charles B. Morrey Jr. Assistant Professorships. We invite applicants for these special two year (nontenure-track) positions effective July 1, 1992. Applicants should have a recent PhD in the areas of algebra, analysis, applied mathematics, foundations, or geometry and topology, and should have demonstrated superior research potential. Applicants should send a resume, reprints, preprints and/or dissertation abstract, and ask three people to send letters of recommendation to the Vice Chair for Faculty Affairs at the above address. We should receive this material no later than Jan. 15. 1992.

UNIVERSITY OF CALIFORNIA AT BERKELEY. Dept. of Mathematics. Several temporary positions beginning in Fall 1992 are anticipated for new and recent PhDs of any age in the areas of algebra, analysis, applied mathematics, foundations, or geometry and topology. The terms of these appointments may range from one to three years. Applicants for NSF or other postdoctoral fellowships are encouraged to apply for these positions; combined teaching/research appointment may be made for up to three years. Mathematicians whose research interests are close to those of regular dept. members will be given some preference. Applicants should send a resume, reprints, preprints and/or dissertation abstract, and ask three people to send letters of recommendation to the Vice Chair for Faculty Affairs are the above address. We should receive this material no later than Jan. 15, 1992.

UNIVERSITY OF CALIFORNIA AT LOS ANGELES, Dept. of Mathematics. REGULAR POS. IN PURE AND APPLIED MATHEMATICS. Subject to administrative approval, 1 or 2 regular pos. in pure and applied mathematics. The 6 specific search areas are as follows: 1) statistics; 2) applied and computational mathematics; 3) logic and mathematical comp. science; 4) geometry and topology(including dynamical systems and geometric partial differential equations); 5) analysis and differential equations (including Lie groups, mathematical physics, probability and game theory); 6) algebra, number theory and combinatorics(including algebraic geometry and representation theory). Very strong promise in research and teaching required. Pos. initially budgeted at the asst. prof. level. Sufficiently outstanding candidates at higher levels will also be considered. Teaching load: avg 1.5 courses per quarter, or 4.5 quarter courses per yr. To apply, write to Thomas M. Liggett, Chair, Dept. of Mathematics, Univ. of Cal., Los Angeles, CA 90024-1555.

UNIVERSITY OF CINCINNATI, Dept. of Mathematical Sciences, CHARLES PHELPS TAFT POSTDOCTORAL FELLOWSHIPS. Apps. are invited. The award carries an annual stipend of $25,000, plus moving expenses up to $500, and a research allowance of $1,000. Health insurance, single coverage, is included. Deadline is 2/1/92. Additional info may be requested from Taft Postdoctoral Fellowships, Univ. of Cincinnati, ML 627, Cincinnati, OH 45221.

UNIVERSITY OF HAWAII. One or more tenure-track professorships possible in Fall 1992, pending clearance. Rank open. Duties include math research and teaching 6 credit hrs. per semester. Minimum qualifications include a Math PH.D, commitment to research and teaching, achievement appropriate to rank, and research interest complementing those of the Dept. E-mail ramsey@kahuna.math. Hawaii.Edu for list of faculty, their research interests, and info about Honolulu. Normal salary range: $34,644-$51,264(asst), $43,824-$64,872(assoc), $53,316-$78,924 (full). To apply, write to Prof. L.T. Ramsey. Have 3 references send confidential letters directly to the chairman. Letters of references must be postmarked by 12/24/91 to guaranteed full consideration. Deadline for apps: Postmarked by 12/24/91.

UNIVERSITY OF ILLINOIS as Urbana-Champaign. Apps are invited for one or more tenure-track or tenured faculty positions commencing 8/92. We are particularly interested in hiring in the areas of applied mathematics, combinatorics, optimization, partial diff. equations, and probabality. Outstanding candidates in all fields of mathematics are encouraged to apply and will be seriously considered. Some visiting appointments for the 92-93 acad. year are also anticipated. Salary and teaching load are competitive. Candidates must have completed their PhD by the time the appointment begins. Candidates should send a letter of application, curriculum vitae and publication list, and arrange to have 3 letters of reccomendation sent directlt to C. Ward Henson, Chair, Dept. of Mathematics, U. of Ill. at Urbana-Champaign, 1409 W. Green St., Urbana Ill, 61801. Tel (217) 333-3352. To ensure full consideration, all application materials, including ref. letters, should be received by 12/2/91. Interviews may be conducted prior to 12/2, but all completed apps will receive full consideration. Candidates are expected to present evidence of excellence, or potential for excellence, in research or teaching.

UNIVERSITY OF IOWA. 1. One tenure-track appointment at the Asst. or beginning Assoc. Prof. level starting in the 1992-93 academic yr. The pos. is to be filled by a specialist in some aspect of harmonic analysis/representation theory, probability theory/stochastic analysis, or topology of manifolds/dynamical systems. Selection will be based on evidence of outstanding research accomplishments or potential, and teaching ability. A PH.D. or equivalent training is required. 2. Pending availability of funds, one or more visiting pos. for all or part of the 1992-93 academic yr. Selection will be based on research expertise and teaching ability. Preference will be given to apps. whose scholarly activity is of particular interest to members of the current faculty. Women and minority candidates are especially urged to apply for the above pos. The Univ. of Iowa welcomes the employment of highly-qualified professional couples on its faculty and staff, permits the appointment of faculty couples within the same dept., and permits the sharing of a single appointment by a faculty couple. Formal screening will begin 1/2/92. To apply, send a complete vita and have 3 letters of recommendation sent to: Prof. Richard Randell, Chair, Dept. of Mathematics, Univ. of Iowa, Iowa City, Iowa 52242.

UNIVERSITY OF KANSAS. Apps. are invited for tenure-track pos. at the asst. or assoc. prof. level and for visiting pos. at the asst. prof. level(depending on funding), beginning 8/17/92 or as negotiated. Field is unrestricted but preference will be given to candidates whose specialties mesh well with those already represented in the dept. Candidates must have a PH.D. or its requirements completed by 8/15/92. Postdoctoral experience for tenure-track pos. is preferred but optional. App., detailed resume with description of research, and 3 recommendation letters should be sent to C.J. Himmelberg, Chairman, Dept. of Mathematics, 405 Snow Hall, Univ. of Kansas, Lawrence, KS 66045-2142. Deadlines: 12/1/1991 for first consideration, then monthly until 8/1/92.

UNIVERSITY OF MARYLAND, The Dept. of Mathematics and Statistics, has been authorized to hire a faculty member in Statistics at the Asst. Prof. level for the fall of 1992. Appointment at the rank of Assoc. Prof. may be considered for exceptionally well-qualified candidates. The dept. has a group of 5 research statisticians, all of whom are doing externally funded work in theoretical and applied statistics. The dept. has excellent computing resources which include a 4 processor Stardent 3000, 5 DEC Station 5000's and 6 DEC Station 3100's. Candidates should have PH.D. in statistics and strong commitment to teaching and research. Preference will be given to candidates with research interests in Quality Control, Reliability or Computational Statistics. CV, 3 reference letters to James M. Greenberg, Chairman, Dept. of Mathematics and Statistics, University of Maryland, Baltimore County, Baltimkre, MD 21228-5398. Apps. considered until suitable candidate found.

UNIVERSITY OF MICHIGAN, Department of Mathematics, Ann Arbor, MI 48109-1003, Professor D.J. Lewis, Chairman Expect to have 3-5 tenure eligible positions. Searching in particular in Algebraic Number Theory, Topology, Analysis, Applied Mathematics, Representation Theory. Preference for individuals that would significantly broaden and strengthen areas presently represented. Exceptional research and teaching background required. Applicants considered on a continuing basis. Salary negotiable. Starting date: September 1992.

UNIVERSITY OF MICHIGAN, Department of Mathematics, Ann Arbor, MI 48109-1003, Professor D.J. Lewis, Chairman Expect to have at least 2 T.H. Hildebrandt Research Assistant Professorships. 3-year appointment, reduced teaching load. Also expect to have several 3-year terminal Assistant Professorships. Preference given to persons of any age having the Ph.D. degree less than 2 years, with a research interest in common with senior faculty. Applicants should have a strong research program and serious commitment to teaching. Application deadline: 3 January 1992. Salary competitive. Possibility for additional income in summer. Starting date: September 1992. University of Michigan, Department of Mathematics, Ann Arbor, MI 48109-1003, Professor D.J. Lewis, Chairman Expect to hire Director of Mathematics Laboratory which supports students in courses through the second year of calculus. The position will be at the Lecturer or Assistant Professor level. In addition to the Math Lab duties the Director participates in the coordination of entry level courses and teaches. Candidates should have a strong record in teaching and an interest in current developments in undergraduate courses including the incorporation of computers and calculators into the curriculum. Some admin experience as well as experience training or supervising instructors is desirable. Ph.D. in mathematics preferred. First review of applications 1/15/92. Starting date: 15 August 1992.

UNIVERSITY OF MINNESOTA, SCHOOL OF MATHEMATICS, may have available one or more tenure track Asst. Prof. or tenure Assoc. or Full Prof. pos. starting Fall 1992. PH.D. by the beginning date of pos., outstanding research and teaching abilities are required. Apps. at all levels are invited, but preference will be given to candidates whose research interests are compatible with those of the School. Salary competitive. Consideration of apps. will begin 12/1/91. Contact Eugene Fabes, Head, School of Mathematics, Univ. of Minnesota, 127 Vincent Hall, 206 Church St S.E., Minneapolis, MN 55455.

UNIVERSITY OF MISSOURI, DEPT. OF MATHEMATICS. Apps. are invited for 1 tenure-track position at the rank of asst. prof. beginning in Aug. of 1992. The pos. requires a PH.D., quality teaching, and a commitment to a distinguished research career. Selections for the pos. will be based primarily on demonstrated research achievement in an area complementary to areas of ongoing departmental research. Send a curriculum vitae along with a letter of app.(include E-mail address), and arrange for 3 letters of recommendation to be sent to : Prof. E. Saab, Chair, Univ. of Missouri, Dept. of Mathematics, Columbia, MO 65211. The app. deadline is 12/31/91, or until the pos. is filled thereafter. Apps. received after 2/1/92 cannot be guaranteed consideration.

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL, Department of Mathematics invites apps for 1 faculty appt. effective Fall '92. Rank and salary depend on qualifications and budget considerations. PhD in mathematics highly preferred, exceptionally strong research program and commitment to excellent teaching required. Send curriculum vitae, abstract of current research program, and 4 letters of reccomendation to Search Committee Chairman, Math. Dept., CB # 3250 Phillips Hall, UNC at Chapel Hill, NC 27599-3250. Complete apps received by 2/15/92 are assured of full consideration.

UNIVERSITY OF NORTH TEXAS, Mathematics Division has two new tenure-track positions and one visiting position beginning with the Fall Semester in 1992. The rank will be at the Assistant Professor level (possibly negotiable to the Associate Level for qualified candidates). Salaries are competitive. The department seeks to appoint persons who have outstanding research potential and who will be outstanding teachers. Send vita and have three or four reference letters sent to: John Ed Allen, Chairman, Mathematics Dept., University of North Texas, PO Box 5116, Denton, TX 76203-5116.

UNIVERSITY OF PITTSBURGH. Department of Mathematics and Statistics. The department invites applications for the following positions, which will be available for September, 1992 if funding permits. 1. Assistant Professor in pure mathematics. We have a significant preference for someone in algebra, topology, or geometry. 2. Visiting Assistant Professor in mathematical biology. Here we have a preference for an individual with a strong computational aspect to their research. There is a possibility that the person appointed to this position will be considered for a tenure track position for the following year. Requirements include outstanding research accomplishment and potential commensurate with experience, and ability and interest in excellent teaching. Applicants should send resume and arrange to have at least three letters of recommendation sent to: S. Hastings, Chairman, Department of Mathematics and Statistics, University of Pittsburgh, Pittsburgh, PA 15260.

UNIVERSITY OF RICHMOND. Tenure-track asst. prof. of mathematics pos. available Fall, 1992. The University is a private, financially secure, predominantly liberal arts institution of 3000 full-time students. The Math & Comp. Sci. Dept. has 15 faculty, 11 in the Mathematics Program. Teaching load is 9 hours per semester. Candidates with an interest in undergraduate teaching while maintaining an active interest in scholarship are encouraged to apply. Candidates should expect to complete the PH.D. by the start of the 1992-93 session. Salary is competitive. Deadline for apps. is 2/17/92. Address enquires to: J.K. Kent, Math. & CS Dept., Univ. of Richmond, VA 23173.

UNIVERSITY OF SOUTH CAROLINA, Dept. of Mathematics invites applications for expected tenure-track faculty position for Fall 1992, at all ranks. Applications in all areas of mathematics will be considered. Research is supported by excellent in-house library and computer facilities. The PhD degree or its equivalent is required. Appointments will be consistent with the Department's commitment to excellence in research and in teaching at the undergraduate levels. A detailed resume, containing a summary of research accomplishments and goals, and four letters of recommendation should be sent to: Dr. George F. McNulty, Chairman, Dept. of Mathematics, University of South Carolina, Columbia, SC 29208.

UNIVERSITY OF TENNESSEE-KNOXVILLE. The Mathematics Dept., in an effort to significantly improve its research position, seeks to fill a tenure-track asst. professorship in harmonic analysis, several complex variables, function theoretic operatic theory, diff. geometry, numerical mathematics, theoretical probabaility and stochastic processes. Employment begins 8/92. Substantial research promise as well as dedication to teaching are paramount. Interested applicants should arrange to have a vita, 3 letters of reference, and a research statement sent to Prof. John B. Conway, Mathematics, U. of Tennessee, Knoxville, TN 37996-1300. Review of apps will begin 12/1 and will continue until position is filled.

UNIVERSITY OF TEXAS AT AUSTIN. Dept. of Mathematics, Austin, Tx 78712. Openings are expected for Fall 1992 at all levels, inc. Instructor, Asst. Prof., Assoc. Prof., and Professor. Candidates should have outstanding research ability and concern for teaching. Duties include teaching undergrad and grad courses and conducting independent research. Apps at all levels are expected to have completed the PhD by Aug. 31, 1992. Salaries competitive. If you have access to e-mail, request a form from recruit@math.utexas.edu. Otherwise, please send vita, detailed summary of research interests and 3 recommendation letters to address above as follows: Instructor and Asst. Prof: c/o Recruiting Committee. Assoc. Prof and Prof: c/o Efraim P. Armendariz, Chair.

UNIVERSITY OF WASHINGTON, Dept. of Mathematics. Assistant Professor. One or more tenure track positions may be filled. Apps should have the PhD degree and be highly qualified for undergrad and grad teaching and independent research. Applications, including a c.v., statement of research and teaching interests, and 3 letters of rec., should be sent to Prof. Edward B. Curtis, Appts. Committee, Dept. of Math, University of Washington, GN-50, Seattle, WA 98195. Priority will be given to apps received before 2/1/92.

UNIVERSITY OF WASHINGTON, Dept. of Mathematics. Acting Assistant Professor. One or more nontenure track positions may be filled. Apps should have the PhD degree and be highly qualified for undergrad and grad teaching and independent research. Applications, including a c.v., statement of research and teaching interests, and 3 letters of rec., should be sent to Prof. Edward B. Curtis, Appts. Committee, Dept. of Math, University of Washington, GN-50, Seattle, WA 98195. Priority will be given to apps received before 2/1/92.

VANDERBILT UNIVERSITY, DEPT. OF MATHEMATICS. Asst. Professor. Specialization in approximation theory, computer-aided design, or numerical analysis. This pos. is intended for a person whose primary research involves computing. It is an initial 3 yr. appointment beginning Fall, 1992. It is renewable and tenure track. Outstanding research potential and evidence of effective teaching is required. Have vita and 4 letters or recommendation(including 1 about teaching) sent to Prof. Glenn Webb, Chair. Vanderbilt Univ., Dept. of Mathematics, 1326 Stevenson Center, Nashville, TN 37240.

VANDERBILT UNIVERSITY, DEPT. OF MATHEMATICS. ASST. PROFESSOR. PH.D. required with 2 yr. appointment beginning Fall, 1992. This is not a tenure track appointment but is intended for a person with demonstrated research potential who would like to spend time in a dept. with a vigorous research atmosphere. We are especially interested in someone who works in one of the areas of departmental strengths which include universal algebra, differential equations, approximation theory, operator theory, mathematical biology, applied mathematics, graph theory, and topology. Apps. should have a strong commitment to teaching. Have vita and 4 letters of recommendation(including 1 about teaching) sent to Prof. Glenn Webb, Chair. Vanderbilt Univ., Dept. of Mathematics, 1326 Stevenson Center, Nashville, TN 37240.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY, DEPT. OF MATHEMATICS. Apps. are sought for a potential appointment at the senior-level beginning Fall 1992. A demonstrated outstanding research record and a strong commitment to teach are required. Candidates with research interests in Applied PDE's, Computational Math/Numerical Analysis, Discrete Math, Dynamical Systems, or Geometry are especially encouraged to apply. Apps. should send a curriculum vitae to Robert Wheeler, Search Committee, Mathematics Dept., Virginia Tech, Blacksburg, VA 24061-0123. Apps. will be accepted for as long as a potential pos. remains open but no later than 5/1/92.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY, DEPT. OF MATHEMATICS. Apps are invited for a tenure-track pos. in Geometry(differential or algebraic, or related areas) beginning Fall 1992. Because we seek apps. who will be able to develop a strong case for eventual promotion and tenure, preference will be given to those with postdoctoral or instructorship experience and established research programs. Please send vita and brief description of research and have 3 letters of reference sent to: Prof. Frank Quinn, Chair, Geometry Search Committee, Dept. of Mathematics, Virginia. Tech, Blacksburg, VA 24061-0123. Apps. will be accepted until 3/15/92, or until pos. is filled.

WASHINGTON UNIVERSITY in ST. LOUIS. Open Fall 1992, a 2 yr. non-tenure track asst. prof. intended for recent PH.D.'s whose research interests match those of members of the dept. These include certain types of analysis, geometry, topology, algebra, probability and wavelets. Duties include teaching 2 courses 1 semester, 1 course the other semester. Send a letter of app., vita, and have 3 letters of reference sent to: Gary R. Jensen, Washington Univ. in St. Louis, Dept. of Mathematics, BOX 1146, St. Louis, MO 63130. Apps. completed by 3/1/92, are assured consideration.

WAYNE STATE UNIVERSITY, Dept of Mathematics, Detroit, MI 48202. Pao-LIu Chow, Chair. Apps invited for tenure track and possible visiting positions for 92-93. PhD in mathematics required. Excellence in research and teaching expected. Applications should include a signed, detailed vita, description of current research interests, and 3 letters of rec.

WELLESLEY COLLEGE, Wellesley, MA 02181-8289. Two or three tenure track positions at the Asst. Prof. level beginning Fall '92. Teaching load is currently 4 courses per year. Requirements include a PhD in mathematics (completed or expected by June '92), excellence in and commitment to both undergrad teaching and mathematical research in a liberal-arts environment. Candidates with research interests in any area of mathematics will be considered. Apps should send a c.v. and arrange for at least 3 recommendation letters that address both teaching and research. Applications and rec. letters should be sent to arrive by 12/6/91 to ensure full consideration. Reply to: Search Committee at the above address.

WESLEYAN UNIVERSITY. Computer Science. The Department of Mathematics invites applications for a tenure-track position in computer science at the junior level. Candidates should have a Ph.D. in computer science or its equivalent, an active research program, and commitment to excellence in teaching at both the undergraduate and graduate levels. The department has an active Ph.D. program, and consists of sixteen faculty, four of whom comprise the computer science group. Areas currently represented in the computer science group include algorithms, programming languages, concurrency and parallel languages, term rewriting and unification, and computational logic; the computer science group also benefits from departmental research in category theory, logic, combinatorics and algebra. The current teaching load in computer science is three courses per year. Application should be sent to: Dan Dougherty, Search Committee, Department of Mathematics, Wesleyan University, Middletown, CT 06459.

AWM Workshop sponsored by NSF and ONR
Baltimore, Maryland
Tuesday, January 7, 1992

AWM will hold its third AWM Workshop sponsored by the National Science Foundation and the Office of Naval Research on Tuesday, January 7, 1992 prior to the AMS/MAA Joint Mathematics Meetings in Baltimore, Maryland. The Workshop will provide opportunities for women to discuss their research and to participate in a number of activities throughout the day. Ten women (within 5 years of their PhD), who were selected for funding, will give 30 minute talks on their research. Ten graduate students, also funded by NSF and ONR, will participate in a poster session. There will be a luncheon, open to all workshop attendees, which will include a panel discussion featuring representatives from funding agencies. A Workshop Dinner (reservations required through AMS Meetings registration) will end the day long program which is open to everyone - women and men. Join AWM for a great way to start off the Joint Meetings!

Pending NSF approval.....

AWM will continue to sponsor the **NSF-AWM TRAVEL GRANTS FOR WOMEN**. The objective of the NSF-AWM Travel Grants is to enable women to attend research conference in their field, thereby providing a valuable opportunity to advance women's research activities, as well as increase the awareness that women are actively involved in research. If more women attend meetings, we increase the size of the pool from which speakers at subsequent meetings are drawn and thus address the problem of the absence of women speakers at many research conferences.

The Travel Grants. The grant will support travel and subsistence to a meeting or a conference in the applicant's field of specialization. A maximum of $1000 for domestic travel and of $2000 for foreign travel will be applied.

Eligibility. Applicant's must be women holding a doctorate in a field of research supported by the Division of Mathematical Sciences of the NSF (or have equivalent experience). A woman may not be awarded more than one grant in any two-year period and should not have available other sources of funding (except possibly partial institutional support).

Target Dates. The next due date (pending NSF Approval) is

Applicants should send a description of their current research and how the proposed travel would benefit their program, a curriculum vita, and a budget to Association for Women in Mathematics, Box 178, Wellesley College, Wellesley, MA 02181.

AWM

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AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

Box 178, Wellesley College, Wellesley, MA 02181

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