

AWM

ASSOCIATION

FOR WOMEN IN

MATHEMATICS

Volume 25, Number 5

NEWSLETTER

September-October 1995

PRESIDENT'S REPORT

Mary Gray Receives the AAAS Mentor Award

Congratulations to our Founding President, Mary Gray, who received the 1994 AAAS Mentor Award. This award is for her lifetime achievements in devoting her career to increase the number of women and minorities in mathematics, and in addition for contributing her talents and energies to advocating the rights of women and minorities in academia (see pages 4 and 5 for a photo and more info).

Sloan Fellowship

Congratulations to Andrea L. Bertozzi, University of Chicago; Lucia Caporaso, Harvard University and Ruth J. Lawrence, University of Michigan for receiving 1995 Sloan Fellowships (there are a total of 20 awards in Mathematics). The percentages of women Ph.D.'s and junior faculty have been increasing slowly but steadily in the past few years, and we hope that this trend will continue and spread to tenure positions. A junior woman who is awarded a Sloan Fellowship will almost surely receive tenure, so I would like to ask chairs of departments and mentors of women junior faculty not to overlook the possibility of nominating strong junior women for this award. The deadline is September 15. Candidates must be members of the regular faculty at a college or university in the United States or Canada and must be at an early stage of their research careers. For information write: Sloan Research Fellowships, Alfred P. Sloan Foundation, Suite 2550, 630 Fifth Avenue, New York, NY 10111.

Minisymposium for Women Postdoctoral Mathematicians at ICIAM 95

AWM will hold an AWM-SIAM-ONR minisymposium for women postdocs at the Third International Congress on Industrial and Applied Mathematics (ICIAM 95), July 3-7, 1995, in Hamburg, Germany. This minisymposium is organized by Joyce McLaughlin (Rensselaer Polytechnic) and Mei Kobayashi (IBM, Tokyo). The

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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.

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speakers are Rachel Kuske (Stanford University), Thomas Erneux (Université Libre de Brussels), Mary Ann Horn (University of Minnesota), Anne Morlet (Ohio State University), Yuji Kodama (Ohio State), and Jennifer Zhao (University of Michigan).

NSF Travel Grants

The AWM-NSF Travel grants are awarded three times per year, in February, May, and October. In the May round, awards went to Lisa Bernstein, Mary Bradley, Elena Galaktionova, Esther Hunt, Elizabeth Jurisich, Saeja Oh Kim, Malgorzata Klosek, Elisabetta Manduchi, Victoria Powers, and Yanqing Sun. Congratulations to all of you. The next deadline for applications is October 1.

Workshop Application

The deadline for applying to the AWM-ONR workshop for graduate students and postdocs at the January Joint Meetings in Orlando is October 1. I would like to encourage women graduate students who are finishing up their theses and women researchers who are within five years of receiving their Ph.D.'s to apply.

Happy 80th Birthday to Lee Lorch

Lee Lorch has been a long-time friend and supporter of AWM, and I would like to wish him a very happy 80th birthday on September 20th. This June, there was a conference at York University in Lee's honor. Both our Founding President Mary Gray and Past President Cora Sadosky gave talks at that conference, and Mary Gray also conveyed AWM's greetings.

Susan Quinn's Article

Susan Quinn is the author of *Marie Curie: A Life*. Her book was on the *New York Times* non-fiction bestseller list for many weeks. Several months ago at Brandeis University, I heard her give an excellent talk with the title "Did Marie Curie's Visits to America Open Doors for Women or Slam Them Shut?" I asked her whether she would write up her talk for our *Newsletter*, and she agreed to do so. Her article will be published in parts starting this issue. I would like to thank Susan for sharing her thoughts with all our members.

Articles on Women's Groups in Graduate Departments

Recently support groups for women mathematicians have been formed in several mathematics departments, and I invited Sarah Greenwald from Penn, Concha Gomez from UC Berkeley, Satomi Okazaki from MIT, and Elizabeth Allman from UCLA to write articles about their groups. Many thanks to them for writing these articles for us. I hope they will help inspire more women mathematicians to form such groups in their own schools.

IAS/Park City Mathematics Institute

This is a mathematics education program that integrates research and educational components at many levels. It brings together high school teachers, undergraduate and graduate students, faculty and researchers to participate in distinct but overlapping programs. The topic for this year is "Non-linear wave phenomena," and it is being held at Park City from July 9th to 29th. Karen Uhlenbeck and I also organized for PCMI a two-week mentoring program for women undergraduate and graduate students. It was held at the Institute for Advanced Study in Princeton in May. Susan Friedlander, Barbara Keyfitz and Joyce McLaughlin were the main lecturers for this year's mentoring program. Nancy Hingston of Trenton State organized a successful AWM panel discussion "How I became a mathematician" with panelists Fan Chung, Jay Talvacchia, Barbara Keyfitz, and Susan Friedlander. Joyce will write an article about the May program, and we will also have an article on the program for high school teachers in the next issue of the *Newsletter*.

I am writing this report from Park City, a beautiful place surrounded by high mountains, and I am enjoying the talks, alpine walks, and working in the cool weather. I hope you too are all having a fine summer.



Chuu-Lian Terng
July 20th, 1995
Park City, Utah



VIVIENNE MALONE MAYES: 1932-95

The mathematics community has lost a devoted and valuable member who gave many years of noteworthy service. Vivienne Malone Mayes passed away of a heart attack on June 9, 1995. She completed the Bachelor and Master degrees at Fisk University where both of us were privileged to begin our long friendship with her. She earned the Ph.D. in mathematics from the University of Texas in 1966 where she was the only Black female in her graduate mathematics classes, with all the difficulties that membership in these categories guaranteed. She served as Chairwoman of the Mathematics Departments of Paul Quinn College and Bishop College before taking a position at Baylor University where she became Professor of Mathematics.

Vivienne Mayes was a member of AWM, NAM, MAA and AMS and gave presentations at the national meetings of each organization. She served as a member of the Executive Committee of AWM and as a member of the Board of Directors of NAM. With skill, integrity, steadfastness and love, she addressed the problems of women and minorities within the mathematics community and was respected for her views and courage.

By Etta Z. Falconer, Spelman College and Lee Lorch, York University. This announcement (necessarily brief because of the publication schedule) will be followed by a more extensive appreciation in the next issue.

BMS COLLOQUIUM: CORRECTION

We apologize for titling the Board on Mathematical Sciences (BMS) event last issue as CBMS Chair Colloquium; CBMS is of course the Conference Board of the Mathematical Sciences. This excellent series of colloquia has been held for the past ten years entirely under the auspices of the BMS. This year's Colloquium will be held on October 20-21; see last issue for more information.

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

Individual: \$40

Family (no newsletter): \$30

Retired, part-time: \$20

Student, unemployed: \$10

Contributing: \$100

All foreign memberships: \$10 additional for postage

Institutional:

Level 1 (two free basic job ads and up to ten student memberships): \$120 (\$200 foreign)

additional student memberships: \$10 (\$18 foreign) for next 15; \$6 (\$14 foreign) for remainder

Level 2 (two free basic job ads and up to three student memberships): \$80 (\$105 foreign)

Affiliate: \$250

Corporate: \$150

Subscriptions and back orders

All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for \$40/year (\$48 foreign). Back orders are \$6/issue plus shipping/handling (\$5 minimum per order).

Payment

Payment is by check (drawn on a check with a U.S. branch), U.S. money order, or international postal order. Cash payment will be accepted if necessary, but only in U.S. currency.

Ad information

AWM will accept advertisements for the *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 Association Administrator, 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 basic job ads as a privilege of membership. For non-members, the rate is \$60 for a basic ad (eight lines of type). Additional lines are \$6 each.

Deadlines

Editorial: 24th of January, March, May, July, September, November

Ad: 1st of February, April, June, August, October, December

Addresses

Send all *Newsletter* material except ads and book review material to Anne Leggett, Department of Mathematical Sciences, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; phone: (312) 508-3554; fax: (312) 508-3514; email: leggett@math.luc.edu. Send all material regarding book reviews to Marge Murray, Department of Mathematics, 460 McBryde Hall, Virginia Tech, Blacksburg, VA 24061-0123; email: murray@calvin.math.vt.edu. Send everything else, including ads and address changes, to Dawn V. Wheeler, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: (301) 405-7892; email: awm@math.umd.edu.

LETTER TO THE EDITOR

The July–August 1995 AWM *Newsletter* contains an interesting and informative article entitled “The Future (and Present) of Mathematical Communications” by Daniel B. Szyld of Temple University. The principle subject of the article is the state of mathematical electronic journals.

I would like to point out two problems about which those of you who are employed at Ph.D.-granting institutions may be unaware.

1. There are still many mathematicians employed at institutions that do *not* provide the faculty with access to the Internet.
2. Szyld's article contains the following statement:

The authors are mathematicians, and so are the editors and referees, none of whom charge for their work. We have always been paid by our institutions to perform these activities.

There are many mathematicians who are employed at institutions that do not pay them to do research or to referee. The existence of these mathematicians has been ignored by some of our professional societies for too long.

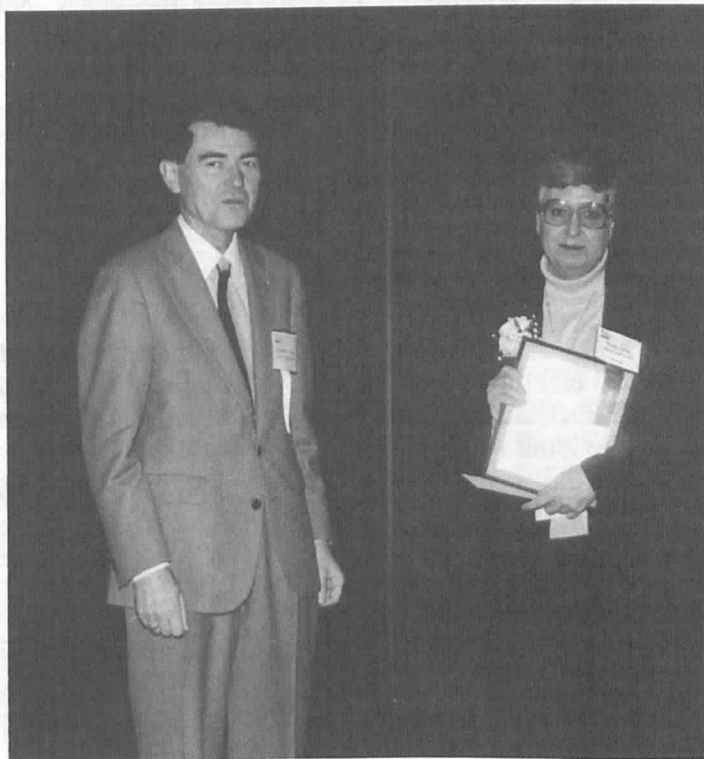
Harriet Lord, Mathematics Department
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AWARDS AND HONORS

CONGRATULATIONS to the people listed below for their meritorious achievements.

MARY W. GRAY, Professor of Mathematics and Statistics, American University received one of two 1994 AAAS Mentor Awards for Lifetime Achievement at the February annual meeting of the AAAS in Atlanta. The Award honors individuals who have demonstrated extraordinary leadership in increasing the participation of individuals from underrepresented groups in the study of science and engineering. The citation read:

Dr. Gray is being recognized for mentoring over 90 underrepresented students throughout her career. Her dedication has been mirrored by the



Francisco J. Ayala, Chairman, Board of Directors, AAAS;
Mary W. Gray, American University, with her award

resultant success of the students she has mentored. The founding President of the Association for Women in Mathematics, Dr. Gray has also served as advisor for doctoral studies and for the Graduate and Professional Opportunities Program Fellowships for Ph.D. students in mathematics education at American University.

The 50th Anniversary Conference of the Canadian Mathematical Society was held in June in Toronto. LEE LORCH, York University and CORA SADOSKY, Howard University delivered public lectures on women in mathematics. The abstract for Lee's talk, "Women in Mathematics," said:

The first Canadian women known to have obtained the Ph.D. in mathematics did so in 1894 and 1895 at Cornell. This was well before they could vote or serve on juries and before Canadian universities offered the Ph.D. It was in 1930 that the first woman received a Ph.D. in mathematics from a Canadian university. Subsequently, the Canadian mathematical scene has been enriched by a number of women educated in Canada and by a number from abroad.

I hope to initiate in this informal talk a discussion of the presence and prospects of women in Canadian mathematical life — and of the encouragement and discouragement they have received, of the recognition of special needs and the importance of their presence. In accordance with this informality, I shall include some recollections of specific individuals.

A substantial excerpt from Cora's talk, "Women in math: what has been achieved, what are we striving for. The importance of organization in the quest for women's right to mathematics," appears beginning on page 22.

The CMS officially named the CMS Prize Lecture for Distinguished Research by Women in Mathematics at this meeting. The Lecture was named in honor of two women who made marks in Canadian mathematics, CECILIA KRIEGER and EVELYN NELSON.

Cecilia Krieger was born in Poland in 1894, graduated from the University of Toronto in 1924 and received her M.A. in 1925. She received a Ph.D. from the University of Toronto in 1930 under the supervision of J. Webber, making her the first woman to earn a mathematics doctorate from a Canadian university. She later held the position of Associate Professor at the University of Toronto and officially retired in 1962, although she continued to teach until 1969. Krieger was an active mathematician, well-known for her translation of Sierpinski's *General Topology* and *Introduction to General Topology*.

Krieger was very active at the University of Toronto, both in the Department of Mathematics and in the Engineering Department, where she worked closely with graduate students. She was also active in the Canadian Association of University Women.

Evelyn Nelson was born in 1943 and educated at McMaster where she received a B.Sc. in 1965 and a Ph.D. in 1970 supervised by G. Bruns. She held various positions at McMaster and was appointed Full Professor in 1983. Dr. Nelson was very well known in the mathematical community, serving as an editor of *Algebra Universalis* and publishing about 45 papers, including several in theoretical computer science. She was also active in the CMS and served on several committees.

She had a special interest in the participation of women in mathematical science and made several

presentations on the contributions of women to mathematics. Indeed, our profession has been enriched by Evelyn's contributions.

The first Krieger-Nelson Prize Lecture was delivered by NANCY REID, Professor of Statistics, University of Toronto. She obtained her B.Math degree from the University of Waterloo (1974), her M.Sc. from the University of British Columbia (1976), and her Ph.D. from Stanford University (1979). Before joining the University of Toronto in 1986, she taught at the University of British Columbia.

She is a Fellow of the Institute of Mathematical Statistics and the American Statistical Association and an elected member of the International Statistical Institute. She was the winner, in 1992, of the Presidents' Award of the Committee of Statistical Societies, awarded annually to a young statistician in recognition of outstanding contributions to the profession of statistics. She is currently the editor of the *Canadian Journal of Statistics*.

Reid's lecture was entitled "Statistics in the twenty-first century: Asymptotic theory and the foundations of statistics." Her abstract reads:

Statistics in the 20th century has been enlivened by a passionate, occasionally bitter, and still vibrant debate on the foundations of statistics and in particular on Bayesian vs. frequentist approaches to inference. In 1975 D.V. Lindley predicted a Bayesian 21st century for statistics. This prediction has often been discussed since, but there is still no consensus on the probability of its correctness. Recent developments in the asymptotic theory of statistics are, surprisingly, shedding new light on this debate, and may have the potential to provide a common middle ground.

MARSHALYN BAKER, Williams Junior High School, Oakland, ME; KAREN MICHALOWICZ, The Langley School, McLean, VA; and ANNADEAN FUGERE, Glenrock Middle School, Glenrock, WY are MATHCOUNTS coaches who received Presidential Awards for Excellence in Mathematics Teaching. Each received a \$7500 grant and a trip to Washington, DC to meet with First Lady Hillary Clinton.

THELMA BRADFORD, North Carolina A&T University was presented a surprise award in May 1995 for "30 years of caring for neighbors, community, and country by volunteering services to the Internal Revenue Service Volunteer and Education Programs." The program also includes training

hundreds of students under the Volunteer Income Assistance program (VITA) over the years. Many of these students have taken jobs with the IRS or with state departments of revenue. Bradford and A&T's program is the longest running in the U.S.

1995 AMS ELECTION

As usual, we have requested all persons standing for election for contested office in the American Mathematical Society (AMS) to submit statements. The letter sent to them read in part:

Topics discussed in the past which you might wish to consider have included the following: the role of the AMS Council, promotion and tenure practices, the current academic job crisis, and the current funding crisis.

A topic of special concern this year is affirmative action. There has been much discussion on this issue in Washington and throughout the country. What are your thoughts on this important issue?

All statements received by press time appear below; others will appear in the next issue. See the AMS *Notices* for biographical data and for statements in support of the presidential candidates.

The Council nominated Frederick W. Gehring and Arthur M. Jaffe for President-Elect, one to be elected for a term of three years. The Council nominated Michael Aschbacher and Spenser J. Bloch for Vice-President. One will be elected for a term of three years. The Council nominated Fan R.K. Chung and Michael G. Crandall as candidates for Trustee, one to be elected for a term of five years. The Council nominated the following candidates for Member-at-Large of the Council: Curtis D. Bennett, David M. Bressoud, Gail Carpenter, John B. Conway, Isom H. Herron, Krystyna M. Kuperberg, Joshua A. Leslie, Andrew M. Odlyzko, George C. Papanicolaou, and Mary Lou Zeeman. Five will be elected to serve terms of three years. The President has nominated the following candidates for the Nominating Committee: Sylvain Cappell, Eric Friedlander, Jane Gilman, Daniel J. Kleitman, James Ralston, and Joel Spruck. Three will be elected. The President has also nominated the following candidates for the Editorial Boards Committee: Jennifer Chayes, Sun-Yung Alice

Chang, and Joel Spencer. Two will be elected. Unless otherwise noted, the respondents are faculty members in departments of mathematics.

PRESIDENT-ELECT

Frederick W. Gehring, University of Michigan

Statement for AMS:

American mathematics, which experienced meteoric growth since 1945, faces serious problems. Immigrating scientists plus considerable federal support following Sputnik stimulated a flowering so dramatic that many prominent researchers from abroad now elect to spend time at American institutions. However, productive graduate programs, another influx of foreign mathematicians and recent spending cuts at the federal, state and local levels have resulted in a shrinking academic job market, reduced research budgets and a decline in achievement levels of entering undergraduates.

The Society has grown from 3,000 members and a \$50,000 budget in 1945 to 30,000 members and a \$19,000,000 budget; its activities have broadened from a focus on scholarship and research to include professional issues such as employment, mathematics education, research funding, public awareness, and representation of women and minorities in the profession. Unfortunately the Society also faces a potentially serious problem since current programs are supported by publication of journals and books, the income from which could change substantially with the advent of electronic publication.

All these problems must be addressed. If elected, my experience as Department Chair at a major public university, Trustee, member of many governing and ad hoc committees, and consultant for two commercial publishers would prove useful.

Statement for AWM:

In the statement above, I have cited some of the serious problems which American mathematics and the AMS face in the coming years. Hence I will limit myself to comments on the topic of special concern that candidates were asked to consider, namely affirmative action.

For some affirmative action is a pejorative phrase, for others a cry to rally. It is, in reality, a minimal, short-term response to redress societal inequities that have prevailed for too long. And while it has proved effective in many cases, much

remains to be done to insure equal opportunities for training and employment of women and minorities. I believe also, in this connection, that more attention should be focused on young high school students where support and encouragement by parents and teachers constitute vital elements in formulating career plans.

I have been a member of the AWM since 1973 and am committed to increasing the participation of all underrepresented groups in the profession.

Arthur Jaffe, Harvard University

Statement for AMS:

This was a banner year for mathematics, with major mathematical progress made in many areas! We are certainly doing something right and justifiably might conclude that mathematics is fundamentally healthy. However, we face serious problems which affect us today and threaten the vitality of the future of mathematics. Paramount issues are declining research funds and a shortage of jobs. The AMS must address this situation by taking a leadership role in increasing recognition of mathematics and communicating its value, excitement, and vigor to the general public, to members of Congress, and to funding agencies. With a shrinking academic market, the AMS must also help mathematicians secure jobs.

In addition, the AMS should encourage broad and inclusive participation in mathematics by all those interested and talented, regardless of gender, race, or economic status. The AMS should strengthen its role in mathematics education and help mathematicians with the new technologies, particularly with making an orderly transition to electronic publication while ensuring access to mathematical results now and in the future. AMS meetings should become even more valuable and engaging, and joint cooperation with the other mathematical organizations should be encouraged. The Society must develop new ways to foster a creative atmosphere for mathematical discovery.

Statement for AWM:

As a member of the AWM, I believe that the AWM and the AMS share many common goals. These include the encouragement of all persons who are talented and interested in mathematics. As a father of a child interested in computers and in mathematics, I was shocked when, at age five, my

daughter explained to me sadly, "Dad, girls don't do math." I hope that the AWM and the AMS can work together to make such attitudes in our society a relic of the past. If I am elected, I would encourage participation by all groups in the work of the AMS.

VICE-PRESIDENT

Michael Aschbacher, California Institute of Technology

Changes in federal funding of science, in the public's expectation of the role of university faculty in undergraduate teaching, and in the number of academic jobs in mathematics are likely to lead to significant changes in the structure of graduate programs in mathematics and the career paths of mathematicians. The AMS has already established committees to consider some of the implications of these changes. This effort should continue and become more focused.

Spencer J. Bloch, University of Chicago

Thank you for offering me the opportunity to comment about affirmative action in connection with my candidacy for vice-president of the AMS. I'm a strong believer in "reality-based" ethics and policy. Thus, affirmative action would have my strong support in the following sorts of situations:

1. An urban police chief wants to hire and promote more black police officers who he feels can establish a better rapport with citizens in high-crime black areas.
2. A state notices that there are too few doctors practicing in minority areas. The state university is told to start a program to train blacks or native Americans or Hispanics or whomever and to encourage them to practice in these poorly served areas.
3. A University notices that women do less well than men in its calculus sequence. The mathematics department is encouraged to hire a woman to administer the sequence and help with mentoring women students.

Specifically, on the issue of increasing the number of women in mathematics, senior women mathematicians with whom I have spoken recently have adopted a philosophy, which I wholeheartedly support, focusing on a careful search for good graduate

school candidates, combined with extensive mentoring, including regular one-to-one meetings and summer study programs. This should lead to a strong young cadre of women in the field, and percentages of senior faculty will grow concomitantly.

I do not support attempts to set numerical quotas for women in tenure positions, and I am much less sanguine about future growth in minority representation among professional mathematicians. Little has been done in this direction, and what has been done has not been effective. Here, again, careful searching, mentoring, and enrichment are important steps.

TRUSTEE

Fan R.K. Chung, University of Pennsylvania

We are today in the midst of a technological revolution. Mathematics will play a vital role both in laying the foundation for this process and in making crucial contributions throughout the whole spectrum of this development. The AMS, as the major organization for fostering mathematics research, has a special responsibility to maximize the impact of mathematicians and to attract the best talent, including, in particular, women and minorities.

Michael G. Crandall, University of California, Santa Barbara

Looking back at candidates' statements from recent years, I was struck by how the rapid pace of change everywhere about us has quickly dated the thoughts of very sophisticated people. For example, it was recently said that what we needed were accurate projections on which to base our planning. Today I put little weight on projections in any arena that look more than a couple of years down the road. Not that long ago people were concerned about outreach partly because, it was reasoned, there will not otherwise be enough mathematicians. Today we all know fine young people leaving the profession because they cannot find adequate employment or because they think that the future is brighter in other directions. Not that long ago it was thought that if we just explained the value of mathematics to the nation more clearly, then we could have a real impact on funding shortages. Which of our thoughts today will ring true in a few years?

The profession has done the right things. It has been active at the national level. It has provided

sound information on the need to evolve the ways we train mathematicians, on appropriate strategies for obtaining employment outside academia, on the need for curricular reform, on the need for educating administrators and how to do so, on the need to evolve the reward structure in academics, on the need to reach out to other disciplines and interact, and so on. The general message is clear and unambiguous — and available on the net. For example, my worthy competitor in this election has made a fine contribution to the dialogue which is available at the Society's *www* site. As always, it is now up to individuals to act, to influence their colleagues, and to support others who are working to adapt to the future as it continuously arrives. I view this as a work which will be in progress for many years to come, just as mathematics is ever in progress. Proper roles for the Society include keeping the profession well-informed and providing support via information and policy statements for those of us in academics who negotiate with administrators and conduct dialogues with our colleagues. I urge individuals to educate themselves, to be creative, to act. Information may come from the top down, but solutions will come from the bottom up. We are the solutions.

I can only provide snapshots of my personal opinions concerning affirmative action, which is an especially lively topic here in California. Mathematics is the most demanding intellectual discipline. Like elite athletes, we all live at the edge of the envelope. I believe that this leads to what I caricature as the "religion of the rankings," a preoccupation with ordering and an exaggerated sense of our ability to order (individuals, departments, universities, all things mathematical). This penchant affects many things. It leads many to undervalue the difficult and valuable work of interacting with other disciplines. It may be used to hide subtle prejudices. It leads some to underestimate the value of a diverse faculty, for they feel it is only the mathematics itself that matters. To me, the most powerful "affirmative actions" do not lie in employment policies, but are the impressive research contributions being continuously made by members of underrepresented groups, a lively dialogue concerning the values of a diverse faculty, and outreach to underrepresented groups beginning as early in their education as possible. In employment, I strongly support affirmative action in the form of broad advertising of positions, careful and fair evaluation of applicants taking diversity into account, mentoring of all young

mathematicians, and challenging those who perceive a list to be objectively well-ordered when it is not. I support "target of opportunity" pursuit of excellent candidates who will significantly enhance departments. I oppose use of coercion to change evaluations which are, in fact, professionally clear and differential standards.

MEMBER-AT-LARGE, AMS COUNCIL

Curtis D. Bennett, Mathematics and Statistics, Bowling Green State University

The most critical issue facing the AMS today is the current job market. I believe the job market has disillusioned a number of junior mathematicians, has forced members of two-career families to leave mathematics, has damaged the teaching and research of many mathematicians and may damage the public perception of our field. I also believe the job market deepens the rift between elite graduate schools and the lesser graduate schools. I feel these problems need to be addressed by the community.

The AMS Council needs to more accurately reflect its membership; in particular, both junior mathematicians and those outside Group I institutions are underrepresented. Having received my Ph.D. in 1990, having been on the job market three times since then, and having been on the board of the Young Mathematicians Network, I would bring a different perspective on the job market than most current councilors. My views are based on personal experience of the effects of the market on today's junior mathematicians. Moreover being a non-tenured faculty member at a Group III institution, I would broaden the Council's perspective on the wide range of institutions represented by the AMS.

Having been asked by the AWM to discuss my views on affirmative action, let me say that while I consider the job market the most serious problem facing the mathematical community today, I find the underrepresentation of minorities and women in the community troubling. I support affirmative action programs to remedy past discrimination and prevent current discrimination by requiring that everyone be given an equal chance. I think, however, that many of the current problems causing the underrepresentation of women and minorities will not be solved by affirmative action; they require new solutions. Currently many institutional and societal barriers make it difficult for people to be successful. The bad job market and the current

tenure system together discriminate against members of two-career families or those with young children; it is hard to juggle family and career while employed temporarily. The hidden prejudices of faculty members and society can inhibit good students from going into mathematics. Students who cannot attend elite institutions often find the best graduate schools closed to them. All of these factors can prevent the best students from entering mathematics. If we truly want all students to have an equal chance, and if we want the best mathematics students, these factors must be dealt with.

Solutions to the poor job market and the problems of underrepresentation are hard to find, and the AMS has little power to enact any solutions. Thus the AMS must use its "bully pulpit" to promote change, to enhance funding of projects (like Uri Treisman's Berkeley program) to open more doors to women and minorities, to encourage departments and faculty to act ethically, and to convince administrators not to cut full-time mathematics faculty. The AMS also needs to promote a broader conception of "good mathematics" so our students are not pushed away from careers in business and industry. This last could do much to improve the image of mathematicians in business and industry, providing greater public support for mathematics and more jobs for all mathematicians.

David M. Bressoud, Mathematics and Computer Science, Macalester College

I fully support the intention of affirmative action and feel that, whatever its weaknesses, it has been a positive force for change. I also recognize that the job that it was to perform, the establishment of equal employment opportunities for women and minorities, has not been accomplished. But I am not certain that the federal government through the existing laws of affirmative action is the right vehicle by which to continue to pursue the objective of equal opportunity. I am attentive to the current debate and am open to suggestions of new strategies through which we can move closer to the ideal that we seek.

Gail Carpenter, Center for Adaptive Systems, Boston University

Statement for AMS:

The AMS should maintain as its primary goal the support and dissemination of mathematical

research. Another currently important task is to try to improve the employment prospects of young mathematicians. By offering conference workshops and helping universities design programs that prepare young mathematicians for non-academic as well as academic employment, the AMS can help bridge the gap between traditional training and useful, challenging job opportunities. The AMS should also continue to help parents of young children maintain their professional lives.

I'd also like to say that I have been a member of AWM since its founding, in the early 1970's, and wholeheartedly support its fine efforts in helping and encouraging women in mathematics.

John B. Conway, Department Head, University of Tennessee

Statement for AMS:

I have concerns about the different directions our profession is being pulled. A close scrutiny of what we do as mathematicians is always profitable, whether the focus is on research direction, increasing our awareness of teaching responsibilities, studying the current state of the job market, or making our society politically and socially involved. The difficulty arises when we concentrate too closely on the problem of the moment and lose sight of the long-term development of Mathematics. Complicating the whole process is the issue of funding. There seems to be a pattern of funding for the problems of yesterday that continues long after the crisis has diminished. An example is the increased federal funding of graduate education in Mathematics to address an anticipated shortage and a continuation of that funding long after the job market for new mathematicians had hit the disaster level.

I would like to see the society set long-range goals to foster education and research in mathematics, to encourage further participation by women and minorities, to assist departments in achieving these goals, and to act as a steadying influence on the direction of the funding agencies.

Statement for AWM:

Regarding the issue of Affirmative Action, I think many aspects of this program have benefitted Mathematics. The requiring of open searches and the stress on having women and minorities apply have resulted in better mathematics departments around the country. The increased red tape is

somewhat irritating, but a relatively minor annoyance if pursued expeditiously.

Nevertheless, the underrepresentation of women and minorities in mathematics departments is still apparent. It is my experience that, despite the attitudes of a few, this state of affairs is not the result of institutional or personal bias. Its roots go deep into our culture, making it a much more difficult problem. The real change must occur at the K-12 level, and these are outside the realm of the AMS.

I think the profession would be well advised to continue to support a program of affirmative action, irrespective of what happens in Washington. Since policies of the AMS have no legal force, the value of such a course would be limited. There are possibilities here, however, besides defining what is acceptable departmental behavior. In addition the Society should promote changes and programs that will encourage women and minorities to pursue careers in Mathematics.

**Isom H. Herron, Mathematical Sciences,
Rensselaer Polytechnic Institute**

Mathematics is an international enterprise. Within that framework, we must take account of our national needs to both reinforce academic infrastructure and to intellectually empower those of diverse backgrounds. Not an easy task, and one that can only begin to be accomplished with a united will. Mathematicians should be enterprising in making our contributions known to society at large.

Krystyna M. Kuperberg, Auburn University

While even the brightest young mathematicians have difficulties finding academic positions, graduate students do most of the work involved in teaching calculus at many universities. Moreover, some of the teaching assistants themselves were never taught by a professor during their undergraduate studies. It seems that budgetary constraints at many institutions of higher education go beyond virtual abolishment of research support and result in neglect of the basic college instruction.

Our pragmatic goal should be to increase the number of "teaching-and-research" faculty positions in mathematics. There are usually more undergraduate students per professor in mathematics than there are in other areas, and the AMS could compile statistics showing such data to help the departments seek new positions. The AMS could

also recognize those departments that make special efforts to create such new positions.

It has always been and still is more difficult for women mathematicians than for men to find appointments, and the situation is most severe for women who together with their spouses are looking for positions at the same place. This problem is quite common today and will become even more so in the future due to the increasing participation of women in sciences and mathematics. A solution, at least a partial one, may exist that would benefit all: the institutions, the individuals and the society.

Joshua A. Leslie, Chair, Howard University

I feel that the present mood in the country is very dangerous for equity for women and minorities with regards to educational opportunity and professional advancement generally. It is my view that the AMS should continue with whatever affirmative action policies have been instituted or we run the danger of seeing the gains of the last twenty years reversed. The mood that seems to dominate the country's legal and political life if left unchecked is unhealthy for mathematics and runs the danger of serious social upheaval.

George C. Papanicolaou, Stanford University

Affirmative action is established hiring and promotion policy for most research universities and it is in mine, Stanford University. I actively support and encourage affirmative action in mathematics, at the undergraduate, graduate and professional-research level and will continue to do so.

**Mary Lou Zeeman, Mathematics, Computer
Science and Statistics, University of Texas,
San Antonio**

Statement for AMS:

The demographics of the American mathematical community are improving. There are more women and minorities entering the field, and one of the better consequences of the current job crisis is that talented young mathematicians are being distributed around the country at large and small colleges and universities alike. Now it is important to represent this diversity on the AMS Council and to ensure that all members of the community have equal opportunity to do research, to travel and to achieve excellence in teaching.

On the subject of affirmative action:

I believe that the general principle of affirmative action is a good one, and I am disappointed by the current national move against affirmative action programs. Those programs were established to combat the lingering effects of generations of discrimination against women and minorities. I do not believe that this goal has been fully achieved yet, so I shall work to protect affirmative action programs in the academic environment until they are no longer needed.

EDITORIAL BOARDS COMMITTEE

Sun-Yun Alice Chang, University of California, Los Angeles

If elected, I will try my best to be well-informed and even-handed in soliciting suggestions of nominations for each AMS editorial committee.

Jennifer Chayes, University of California, Los Angeles

The number of women and minorities in mathematics reflects neither the talent nor the interest of the pool of young researchers. It is therefore imperative that the AMS take a leading role in preserving affirmative action policies in this time of increasing scrutiny and criticism of such policies. We must ensure that affirmative action policies remain in place until they have done their job — namely, to provide equal opportunity and access to talented and dedicated women and minorities in mathematics.

Andrew Granville, University of Georgia

It is up to all mathematicians to nurture the talents of those people who have been disadvantaged, whether it is because of their sex, color or whatever. Affirmative action policies have helped change attitudes in our profession to the extent that most departments are now eager to hire women and people from minorities. Indeed, thanks to a growing awareness, stimulated by groups like the AWM, the focus has now shifted from how to include women and minorities to how to help these individuals become really competitive.

Affirmative action policies in mathematics must be designed to encourage women and minorities to study, research and to lead, so that they can play an

equal role in our profession. This is difficult because the system is not fair. With or without affirmative action policies, there are usually far more expectations placed on women and minorities. For example they are often expected to spend a significant part of their time encouraging other women and minorities; they tend to serve on more committees, tend to be expected to have more dealings with students and are more often selected as "representatives." This means that they don't have equal time to dedicate to research, and research is what counts most when it comes to getting respect from one's colleagues and, subsequently, tenure. This is the new "discrimination," evolving from a misguided desire to promote a cause over an individual, more from misunderstanding than malice, and thus controversial, insidious and difficult to confront.

My own affirmative action efforts focus on making sure that there are no more burdens placed on women and minorities in my department than on any other professors or students. Three of my six current doctoral students are women, and I want them to concentrate on becoming quality researchers and teachers, so that they can be genuinely competitive within their peer group. The tenured faculty should be the ones improving the system so that everyone has an equal chance, rather than having so many new Ph.D.'s involved in (gender and racial) politics in mathematics.

People must be given the opportunity to fulfill their unrealized potential, but we must recognize that there can be many negative consequences of pushing someone too far, too fast. Indeed, if a person is put into a situation for which they are not prepared, then it can create an unrealistic set of expectations which could lead to disappointment because the starting premise was all wrong. This only confirms prejudices, and the net result of such "affirmative action" is to undermine the very cause these policies were designed to substantiate.

AAUP rules state that tenure-track faculty must receive tenure (or be fired) within seven years of being hired. However this policy implicitly assumes that the academic can organize their life so that they have few other pressing concerns during that time. Many women delay having children until completing their doctorate, but wish to do so once they have settled into a tenure-track position. They are then in an almost impossible position of having to produce good enough research work to get tenure, while they may wish to devote a large part of their

attention to their child(ren) (*why do we penalize women and men for making parenting a high priority?*). How can the rules be adjusted to allow people adequate time for parenting, while retaining the safeguards against exploitative universities that the AAUP rule is designed for?

The situation in mathematics is changing. We have more opportunities available to women and minorities than ever before, and more women emerging as leading researchers, though still far too few. Now is the time for the notion of "affirmative action" to mature, and for more white males to consider this issue to be personally important for them too. Not just in obvious situations like giving women and minority students equal consideration, but also by thinking about more complex issues such as how unconscious prejudices are built into the academic system.

NOMINATING COMMITTEE

**Sylvain Cappell, Courant Institute,
New York University**

The officers of the American Mathematical Society have a broad mandate to advance the interests and goals of the academic, professional and research communities in the mathematical sciences, and to thereby serve the interests of the general American society. However, at this time, there is a well-founded broad concern that many key institutions and sectors of American life do not recognize adequately the scientific and educational contributions that mathematical scientists and educators have made, and with appropriate resources could expand on, for societal advancement and to the opening of opportunities for the full range of our young people. This is, in part, reflected in the painful employment prospects now facing so many mathematical scientists and educators. We need to have among the officers of the AMS spokespeople who can express the needs for commitment of resources from the larger society.

I have seen in a variety of contexts the difficulties encountered in advancing the goals of achieving a fuller range of representation of underrepresented groups in the mathematical science professions. I have tried to maintain a close and supportive relationship with my dozen former doctoral students; in particular my female Ph.D. students have discussed with me the special difficulties they have encountered — some reflecting the difficult burdens that

juggling the combination of their personal and professional lives placed on them in a society that didn't always give them the flexibility that they needed and deserved, and others from retrograde or unwelcoming attitudes.

For many years I have served as Chair of my university's Research Challenge Fund Committee, which awards the internal research grants across all the sciences, social sciences and humanities. This committee has been open to funding research projects, many from women or minorities, that reflect valuable studies related to unmet societal needs or issues — while maintaining very high academic standards. When appropriate, this committee has acted to directly extend assistance to promising projects to help them be formulated to achieve both internal and external funding. Through my work on this committee I have learned a great deal from colleagues about these issues.

It is important to create more supportive structures that will enhance the opportunities for advancement of women and underrepresented minority faculties. For many years I have been supervising the mathematical activities and workshops of the Faculty Resources Network which, based at my university, has created scholarly exchange opportunities for faculties from a large group of smaller and minority institutions. About half of the many participants in our mathematical science workshops and academic exchanges have been women academics, and many have been from underrepresented minorities. The professional dedication of the participants, many of whom work under demanding conditions at poorly endowed schools, has been inspiring. I have learned much from them about issues in mathematical life and mathematical education. We have together worked on many occasions to use the resources of this network to target and provide encouragement and support for promising women and underrepresented minority students interested in careers in mathematical sciences.

Eric Friedlander, Northwestern University

The original purpose and continuing central aim of the AMS is the promotion of mathematics. This is done through its publications, meetings, and prizes. The prestige associated to these activities has drawn many mathematicians to the society with diverse concerns for the profession as opposed to the "science of mathematics." Whereas I share

many of these concerns, I advocate that the focus of the AMS not shift too far from the science to the profession.

The AWM has done much to increase the visibility of women in the American mathematical scene, which has been good both for the profession and for women with an interest in mathematics. AWM's efforts to banish often subtle discriminatory practices and provide role models for the next generation should be encouraged.

The Council of the AMS is a public forum which usefully debates concerns of its members. As such, diversity of background and opinion among members of the Council is desirable.

Academia itself is facing a future less promising than its recent past. Fundamental research is threatened with a loss of financial support as well as society's respect and encouragement. The reaction of the mathematics community should not be to abandon its commitment to intellectual challenges in favor of fashionable trends of the day.

Jane Gilman, Rutgers University

The AWM has suggested that this year it would be timely for candidates to discuss affirmative action. In recent years I have heard comments from male mathematicians that they do not have jobs or they do not have the jobs they deserve because of affirmative action. Female graduate students have told me that they have a double burden. They have to face a very bleak job market while being told by their male cohorts that women are getting all of the jobs. I hear disparaging remarks made about achievements of women and minorities with the implication that the achievements are not real, but only a manifestation of affirmative action. In short, there is a lot of unhappiness within the mathematical community.

I have had a great deal of experience sitting upon committees that make decisions about hiring, promotion, and admissions to programs. While we like to think that mathematicians can be linearly ordered by ability and accomplishment, this is not truly the case. There are often clear differences in the level of achievement between some candidates. However, it is my experience that by the time committee members get down to considering the pool of applicants from which they are likely to be able to hire or of students whom they are likely to be able to recruit, the applicants often do not have very

marked differences. It is here that our prejudices, even if they are unconscious, play a role.

Within the last thirty years society at large has seen tremendous social change, and affirmative action has been one tool for effecting this change. As far as the mathematical community is concerned there has been a significant gain in the number of female mathematicians. There has not been a parallel gain in the number of minority mathematicians, and this is cause for concern. There is not a large number of minority mathematicians in job applicant pools at colleges and universities because there are fewer minorities at every level in the mathematical pipeline. The problem starts with inequities at the elementary school level or before. Thus while many research mathematicians may view education at the elementary and secondary level as outside their purview, I think that the mathematical community should be involved an effort to change things.

There is a clear place and need for affirmative action programs in our society and in the mathematical community. It is not clear what the impact of the recent Supreme Court ruling will be. It may be time to reconfigure some programs, but despite the attending difficulties it is not time to do away with affirmative action.

James Ralston, University of California, Los Angeles

I believe that to treat someone respectfully one begins by treating them as an individual. Both the abuses which lead to demands for affirmative action and, unfortunately, some of the solutions proposed are departures from this ideal. In the relatively small world of mathematics it should be possible to judge people on their merits as individuals, but we are lazy. We rely on received opinions from a generation ago and long-established networks of trusted advisors, who, naturally enough, are just like us. I do not know what the most effective means of breaking these bad habits might be. Certainly advocacy groups like AWM, saying in effect, "Hey, we're out here too," help.

**REMEMBER, YOUR AWM
DUES ARE DUE OCTOBER 1!**

BOOK REVIEW

TRUE FICTIONS: A Look at the Autobiographical Writings of American Women: Part I

Jill Ker Conway, editor, *Written by Herself: Autobiographies of American Women: An Anthology*, Vintage Books, New York, 1992; paper, \$15.00, ISBN 0-679-73633-6

The historian Jill Ker Conway has written most engagingly of her own journey from the Australian outback to the presidency of Smith College in two autobiographical memoirs, *The Road from Coorain* and *True North*. In *Written by Herself*, she turns her attention to the autobiographical writing of others, and she has produced a fascinating anthology of the life stories of 25 American women, all written within the past hundred years or so.

In her introduction, Conway points out that autobiography is a unique genre, a blend of fact and fiction:

Autobiographical narratives are fictions, in the sense that the narrator imposes her or his order on the ebb and flow of experience and gives us a false sense of certainty and finality about causation in life. Yet they are not fictions but accounts of real lives, lived in a specific time and place, windows on the past, chances to enter and inhabit the real world of another person, chances to try on another identity and so broaden our own. [p. vii]

The narratives in Conway's collection do not follow the established patterns — heroic, confessional — for the telling of men's lives. Nor do they follow the eighteenth and nineteenth century fashion of the women's spiritual narrative — accounts of conversion and devotion to God. They are, rather, the voices of women from "a culture under stress" — a culture in which the roles and expectations of women were continually being challenged and redefined. These women's stories, like the lives upon which they are based, defy easy categorization. The stories reveal the difficulties the women faced in bringing order and coherence to the telling of lives that were far more adaptive, creative, and improvisational than those of most men.

The accounts in this volume are divided into four sections. The first section is devoted to the distinctive narratives of black women in America, ranging

from the slave narrative of Harriet Ann Jacobs — whose flight from slavery in 1835 was followed by seven years of extreme seclusion and isolation, undertaken to protect her children and assure the possibility of reuniting with them in the North — to the trailblazing accounts of twentieth century black women of arts and letters: Zora Neale Hurston, Marian Anderson, and Maya Angelou. A second chapter is devoted to the accounts of pioneering women in science and medicine in the late nineteenth and early twentieth century; another to authors and artists of the same period; and a final chapter in the collection is devoted to the lives of "pioneers and reformers" who defied classification, including such well known figures as Jane Addams, Margaret Sanger, and Babe Didrikson Zaharias.

As a woman in mathematics, I found the accounts of women in science and medicine to be among the most interesting. I was particularly stricken by the wide variety of paths American women have taken toward a scientific career. The psychologist Margaret Floy Washburn, for example, was quite precocious and received a Bachelor's degree from Vassar College at the age of 20. Her interest in experimental psychology led her to study at Columbia University, where, in the last decade of the nineteenth century, she was barred from the pursuit of a degree. She eventually was able to pursue the Ph.D. at Cornell University, but went on to experience considerable frustration in her attempts to find fulfillment in the academic community. Washburn, like so many of the women in this volume, was enormously productive in the face of considerable obstacles to her success and in 1931 was the second woman elected to the National Academy of Sciences.

Others, like the pioneering physicians S. Josephine Baker and Dorothy Reed Mendenhall, were among the first American women to succeed in the medical community. They, too, faced discrimination in their professions; yet, they created unique and valuable careers, devoted largely to the medical concerns of women, from their positions at the margins of American medical science, and ultimately gained in power and influence as they grew older. Margaret Morse Nice, educated in Biology at Mount Holyoke and Clark, settled uncomfortably into a life shaped by marriage and children, and constructed, from scratch, a sustaining career in

Marge Murray, Book Review Editor, Virginia Tech Department of Mathematics, Blacksburg, VA 24061-0123

ornithology, the impetus for which came from her family's relocation from Cambridge, Massachusetts to the wilderness of Oklahoma in 1913. This section also features autobiographical profiles of the anthropologists Hortense Powdermaker and Margaret Mead and a glimpse into the unconventional life of the British-born astronomer Cecilia Payne Gaposchkin, who, despite her long and distinguished research career at Harvard, did not receive a regular faculty appointment until the year before her election to the National Academy of Sciences!

In this last decade of the twentieth century, we continue to live, as these women did, in a "culture under stress," in a time of economic and political instability and uncertainty. Almost all of the narratives in this collection were written relatively late in life, and many of the women, looking back, comment upon the tremendous changes they have

seen over a lifespan. The strengths of each of these women included adaptability, flexibility, improvisation, but also endurance, adherence to principle, and clarity of vision. Their examples stand as a guide and an inspiration to contemporary women trying to navigate the still-troubled waters of American cultural, political, and scientific life.

**HAPPY 80th
BIRTHDAY TO LEE
LORCH!**

WORKSHOP FOR WOMEN GRADUATE STUDENTS AND POSTDOCTORAL MATHEMATICIANS

supported by the Office of Naval Research and AWM

Over the past seven years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent Ph.D.'s (referred to as "postdocs" below) in conjunction with major mathematics meetings.

The next workshop in the series will be held in conjunction with the annual AMS-MAA Joint Mathematics Meetings in Orlando, FL, January 10–13, 1996. The workshop will be held on Saturday, January 13, 1996.

We invite each participating graduate student to present a poster on her thesis problem and each postdoc to present a talk on her research. AWM will offer funding for travel and two days subsistence for up to twenty participants. Participants will have the opportunity to present and discuss their research and to meet with other women mathematicians at all stages of their careers. Each workshop will also include a panel discussion on issues of career development, a luncheon, and a dinner banquet.

All mathematicians (female and male) are invited to attend the entire program whether or not they are funded. Departments are urged to help graduate students and postdocs obtain some institutional support to attend the workshop and the associated meetings.

To be eligible for funding, graduate students must have begun work on a thesis problem. The word "postdoc" refers to any mathematician who has received her Ph.D. within approximately the last five years, whether or not she currently holds a postdoctoral or other academic position. All non-U.S. citizens must have a current U.S. address. All applications should include a curriculum vitae and a concise description of research; letters of support are encouraged. Each graduate student should include a letter of recommendation from her thesis advisor. Nominations by other mathematicians (accompanied by the information described above) are also welcome.

Please send **five** complete copies of the application materials (including the cover letter) to: Workshop Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Applications must be received by **October 1, 1995**; applications via email or fax will not be accepted. For more information contact the AWM office at (301) 405-7892 or awm@math.umd.edu.

GRADUATE STUDENT GROUPS

Berkeley Noetherian Ring

In the Fall of 1991, a group of about 20 women graduate students, postdocs, and visiting faculty at UC Berkeley came together to discuss issues related to gender and mathematics, particularly here at Berkeley. I was in my second year of grad school and had never seen most of the women at this meeting. Many different views and experiences were presented at the meeting, and there was actually very little agreement about what a typical woman's experience is at a place like Berkeley. One sentiment that most of us did share was the feeling that we were somewhat isolated. At that meeting, a few of us decided to start a group for women in math at Berkeley.

The first few meetings were devoted mainly to figuring out what we wanted from this new group. Some people wanted a weekly lunch meeting, a place to discuss issues and events affecting us as women in the department. Others wanted to learn more about the research that the advanced graduate students and post-docs were doing. In the end, we came up with a meeting format which I believe serves the needs of most of the women in our department.

We meet once a week for one hour, with refreshments at every meeting. The first half hour of the meeting is devoted to socializing, networking, and making announcements. In the last half hour, a member of the group gives an introductory level math talk. Women graduate students are encouraged to use this format as an opportunity to give their first talk in a friendly, supportive environment. Also, many women mathematicians visiting Berkeley or the Mathematical Sciences Research Institute attend our meetings and give talks on their research, and we occasionally hold our meetings at MSRI.

Over the last four years the Noetherian Ring has been involved in other important activities in the department. In 1992 we started a "Big Sisters" program to help entering women students adjust to graduate school at Berkeley. Also in 1992, the Noetherian Ring initiated an interview project in which women graduate students were interviewed in order to gather useful information about how and

why women succeed in graduate mathematics programs. In 1993, with the help of generous faculty donations, we began bringing prominent women mathematicians to Berkeley to give talks at the Department Colloquium.

The Noetherian Ring has received a great deal of support from the Berkeley Mathematics Department, the University of California, and the mathematics community. I hope this means we will see more groups like ours and more women pursuing careers in mathematics.

Friends of Women in Mathematics

Last fall, several women at UCLA joined together to form a new group called Friends of Women in Mathematics (FOWM). Initially our goal was to provide a support group for female mathematicians at UCLA. After our first discussion, however, we broadened our focus: we aim to improve the mathematical graduate experience at UCLA. Our group is comprised of about thirty active members, many of whom are men, and we meet once a month to plan events, delegate duties, and laugh and talk together. The graduate vice-chair advisor serves as a liaison between the faculty and the students.

We have sponsored many successful events. There was interest among the beginning graduate students to learn of the current areas of research at UCLA, so we organized a lecture series for the spring quarter. In a series of five talks, UCLA professors spoke on their research and shared their visions of the important questions in mathematics today. One professor devoted his talk to the process of writing a dissertation and explained the ups and downs of finding a topic and doing mathematical research. These talks were very well attended by both faculty members and students. For the students in the middle stage of completing the Ph.D., FOWM ran a workshop on writing research proposals and applying for dissertation year fellowships. We photocopied applications that were successful in the past and tried to encourage students to apply for all types of financial aid.

In the spring, a group of three women ran a workshop on applying for jobs in academia. We felt

Concha Gomez, Noetherian Ring President, graduate student, Berkeley, concetta@math.berkeley.edu

Elizabeth S. Allman, graduate student, UCLA, eallman@math.ucla.edu

that there was so much involved in applying for jobs and the job market was so tight, that we should pass on the wisdom of our experience to those who will embark on the process next year. We put together a portfolio of materials, computer programs, and general advice for FOWM. All this information is available on the World Wide Web for public consumption.

A rather large group of talented female mathematicians graduated from UCLA this year, and it was their hope that UCLA continue to recruit young women for its graduate mathematics program. FOWM put a lot of effort into recruiting new students: we telephoned prospectives and helped organize two "prospective days." We matched the prospective students with graduate students, escorted them to classes and seminars, organized donuts and coffee, and enjoyed a big dinner at a restaurant. Even with all this effort, the statistics for acceptance by women did not change from the previous year.

Several members of FOWM like to emphasize the warm social environment at UCLA. UCLA students study very hard, but they also have a variety of interests and tend to move in groups. We decided to make a node on the World Wide Web for our new group. To prove that we are a diverse lot, we added a page that lists personal information about our group members. Our members are interested in opera, food, windsurfing, saxophone, and crossword puzzles among other things. On our web page, there is access to biographies of women mathematicians, minutes from our meetings, a statement of purpose, and several other links of interest to women and mathematicians. The URL is <http://www.math.ucla.edu>.

To honor the graduating Ph.D. students, we invited them out to dinner at a restaurant in Los Angeles. At first we thought only to invite the women graduates, but the female graduates thought we should keep in mind that we are "Friends of Women in Mathematics," and we invited all the new doctors to participate. It was a fun way to say good-bye and admire their accomplishments.

Our biggest disappointment this year was in funding. We registered with the university as a campus group in the hopes of expanding our resources. However, university funding is available for things like food and parties and not for sending students to conferences or engaging speakers as we had hoped.

It is interesting to note that although many men are involved in FOWM, it is the women who are

running the workshops and doing most of the organizing for FOWM. The vitality of this group is definitely coming from female mathematicians.

There are several ideas circulating for next year. We would like to invite some speakers to talk at UCLA. Hopefully, we could get a prominent woman mathematician to visit. We are also planning to implement a mentor program for incoming students. A mentor will be a senior graduate student who agrees to help a first year student learn the ropes at UCLA. Of course, we are hoping to continue the lectures by faculty members too. It should be a good year for FOWM.

MIT Noetherian ring

At the 1995 AWM Workshop during the Joint Mathematics Meetings in San Francisco, the UC Berkeley Noetherian Ring gave a talk about its group and its activities. Since someone here at MIT had already expressed interest in hearing about the research of other women in our department, the concrete ideas from the Berkeley group motivated us to decide to get together and organize the MIT Noetherian Ring.

The format our group decided on was to have a half-hour talk by a woman mathematician followed by a half-hour of socializing and refreshments. We welcome everyone at our gatherings. Our seminar began partway into spring semester of this year, and we thought that we could start out with one speaker a month. But so many women both here at MIT and in the greater Boston area were excited about the seminar and offered to speak that we decided to have talks every other week.

The audience consists of a good mix of graduate students, post-docs, professors, and even the occasional undergraduate student. Since the Boston area has many colleges and universities, our seminar announcements are sent out to them. Although our audience is mainly from MIT, a fair number of people from the area also come. The half-hour after the talk is also well-attended and has been a relaxing, informal way to meet other mathematicians at various stages in their careers.

Setting up such a seminar may take some time initially. It seems best to divide the duties. One person could be in charge of contacting prospective

Satomi Okazaki, graduate student in combinatorics, Applied Mathematics, MIT, satomi@math.mit.edu



Women in Mathematics, University of Pennsylvania, May 11, 1995

speakers and scheduling them. Another could then TeX the announcements for the talks and have them sent out to local universities and colleges. Yet another could arrange for the refreshments. In our case, the food is being funded by our department. Our administrators have been very supportive and generous with our group.

In addition to this seminar, the women in our department have informal weekly brown-bag lunches. It is definitely a good forum for getting and giving professional advice, as well as just an easy way of getting to know the other women in the department. Usually, we also have a potluck dinner at someone's house once a term.

We hope to continue all of these activities in the coming year. Given the positive responses and support we have had, we hope to plan other new and interesting programs as well.

Women in Mathematics

Chuu-Lian Terng asked me to write an article describing the formation, goals, and activities of

Sarah J. Greenwald, graduate student, University of Pennsylvania, sarah@math.upenn.edu

Women in Mathematics, a group of women in the Mathematics Department at the University of Pennsylvania.

The group began in September of 1992 as an outgrowth of discussions I had in my first year of graduate school with Ted Chinburg, who was the Graduate Chair then. At the time, there was only one woman on the math department faculty at Penn, Winnie Li, who had an NSF Visiting Professorship for Women position. With \$400 in funding, I picked a day and time, invited the women in the department to our first lunch meeting, and ordered some food.

Since then, the group has continued to meet for monthly lunchtime discussions. Though we began by just eating together, without a set agenda, our discussions quickly led to several activities:

- Annual events for undergraduate women interested in math and for prospective women graduate students.
- Dinner for women attending the 1993 Geometry Festival.
- An open meeting with the department on ways to increase the applicant pool of women and minority graduate students.

- Lunches with senior women mathematicians, sponsored by the Trustee Council of Penn Women and the Department of Mathematics. Our first such lunch was with Fan Chung, who has since joined the Penn faculty as the Class of 1965 Term Professor of Mathematics. More recently, we had lunch with Dusa McDuff, Professor of Mathematics at SUNY Stony Brook.
- Lunch with the director of the Penn Women's Center.

We are currently constructing a world wide web page (<http://www.math.upenn.edu/~sarah/women.html>) and are setting up a small collection of books on Women in Mathematics, which will be accessible to undergraduates as well as members of the department. In the Fall, we look forward to resuming our lunch meetings and welcoming new women into the department.

EDUCATION COMMITTEE

Preparation + Opportunity = Success: Emily Warren Roebling and the Brooklyn Bridge

In May 1883 when the Brooklyn Bridge was dedicated, Congressman Abraham Hewitt devoted a portion of his speech to the remarkable wife of Washington Augustus Roebling, Chief Engineer of the bridge. Of Mrs. Roebling Hewitt said:

So, with this bridge will ever be coupled the thought of one, through the subtle alembic of whose brain, and by whose facile fingers, communication was maintained between the directing power of its construction, and the obedient agencies of its execution. It is thus an everlasting monument to the self-sacrificing devotion of woman, and of her capacity for that higher education from which she has been too long debarred. The name of Mrs. Emily Warren Roebling will thus be inseparably associated with all that is admirable in human nature, and with all that is wonderful in the constructive world of art.

Her lack of higher education notwithstanding, Emily Warren Roebling was an active and

knowledgeable participant in one of the most important engineering and construction projects undertaken in nineteenth century America. For thirteen long years Emily specialized in crisis management as she labored to ensure that the Great East River Bridge, as the span was then known, would be completed and that it would remain a Roebling family project. Throughout this period, she was confronted by numerous challenges. In 1867 her father-in-law, the internationally renowned engineer John Augustus Roebling, designer of the Brooklyn Bridge, contracted tetanus after his leg was caught between a piling and an incoming ferry boat while he was doing preliminary surveying for the bridge. Transported to the Brooklyn Heights home of his son and daughter-in-law, John Roebling attempted to complete the design work for the bridge before his death, within weeks of the accident.

Emily Roebling, long a favorite of her father-in-law, partially filled the void created by his death. She became, in the words of her husband, "a strong tower to lean upon ... a woman of infinite tact and wisest counsel." As he labored to complete the plans for the bridge, Washington Roebling relied upon his wife for moral support. After suffering two attacks of caisson disease, the dreaded bends, Washington Roebling was completely dependent upon his wife. When the second attack occurred in 1872 in the mammoth caisson inching its way to the bottom of the river where it would support the bridge pier on the Manhattan side of the span, he was "nearly insensible" according to Emily, and "his death was hourly expected."

Confounding the doctors, Washington Roebling survived, but the attack left him an invalid. The only person he could bear to deal with during the acute phase of the illness was his wife. She became his liaison with the assistant engineers in the field and with the bridge board of trustees. Thanks to her skillful diplomacy, an attempt to have Roebling removed as Chief Engineer failed. Emily's negotiating skills were also evident in her dealings with suppliers. According to the *New York Times*:

When bids for the steel and iron work for the structure were advertised ... it was found that entirely new shapes would be required, such as no mill was then making. This necessitated new patterns, and representatives of the mills desiring to

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bid went to New York to consult with Mr. Roebling. Their surprise was great when Mrs. Roebling sat down with them and by her knowledge of engineering helped them cut out their patterns and cleared away difficulties that had for weeks been puzzling their brains.

Emily's mastery of engineering principles was only fully revealed when the bridge was completed. The Brooklyn *Eagle*, noting her successful handling of the enormous challenges presented by the project, declared:

Great emergencies are the opportunities of great minds. Mrs. Emily Warren Roebling met this difficulty as nobody else could. She addressed her remarkable intelligence to the acquisition of the higher mathematics; her luminous mind was well-adapted to its profound and often desperate labyrinths. She mastered this most bewildering of sciences, applied it to the bridge, was in rapport with her husband and dazzled and astounded the engineers by her complete and intelligent conception of their chief's theories and plans.

Emily's mastery of higher mathematics was part of the on-the-job training provided by her husband, but as a student at Georgetown Visitation Convent, from which she graduated in 1860 at the top of her class, she had studied algebra, geometry and

bookkeeping, along with rhetoric and grammar, French, astronomy, botany, meteorology, chemistry and geology. The solid grounding she had received in math and science, together with her considerable intelligence, enabled her to go further in mathematics when the need arose.

Had Washington Roebling married another woman, perhaps the outcome of the bridge project would have been very different. That the seemingly insurmountable challenge of building the Great East River Bridge was ultimately overcome was due in no small measure to the remarkable woman Roebling had met at a military ball organized by Emily's brother, Civil War general Gouverneur Kemble Warren, to boost the morale of his troops. For young Washington Roebling, a recent graduate of Rensselaer Polytechnic Institute and member of the Army Corps of Engineers, it was love at first sight. As Washington put it in a letter to his sister: "I am very much of the opinion that she has captured your brother Washy's heart ... and I assure you that it gives me the greatest pleasure to say that I have succumbed." The rest, as they say, is history (or perhaps herstory). Frankly, the Brooklyn Bridge is as much her story as it is his, for without the extraordinary Emily Warren Roebling, there may not have been this Brooklyn Bridge.

NSF-AWM TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Travel Grants program is to enable women to attend research conferences in their fields, thereby providing a valuable opportunity to advance their research activities and their visibility in the research community. By having more women attend such meetings, we also increase the size of the pool from which speakers at subsequent meetings may be drawn and thus address the persistent problem of the absence of women speakers at some research conferences.

Travel Grants. These grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. A maximum of \$1000 for domestic travel and of \$2000 for foreign travel will be applied. International travel must be on U.S. flag carriers whenever possible.

Eligibility. These travel funds are provided by the Division of Mathematical Sciences of NSF, and the research conference must be in an area supported by DMS. For example, this includes certain areas of statistics, but excludes most areas of mathematics education and history of mathematics. Applicants must be women holding a doctorate (or equivalent experience) and having a work address in the U.S. (or home address, in the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years or who has other sources of external funding, including any NSF grant, is ineligible. Partial support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Applications. There will be three award periods per year, with applications due February 1, May 1 and October 1. An applicant should send *five* copies of 1) a description of her current research and of how the proposed travel would benefit her research program, 2) her curriculum vitae, 3) a budget for the proposed travel, and 4) information about all other sources of travel funding available to the applicant along with *five* copies of her cover letter to: Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461.

For more information, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted.

AFFIRMATIVE ACTION: WHAT IS IT AND WHAT SHOULD IT BE?

The Canadian Mathematical Society celebrated its 50th anniversary at its 1995 Summer Meeting with a special program which included public lectures on women in mathematics. The invited speakers for the occasion were Lee Lorch (York University) and Cora Sadosky (Howard University; AWM Past President). Some excerpts from Cora's talk follow to continue our forum on affirmative action. We invite all of you to send us your views on this important topic.

People often remark that in the last decade the situation of women in mathematics has dramatically improved, both in Canada and in the United States. And they are right! The most immediate example is the election, as the new President of the CMS, of Katherine Heinrich, who not only is a talented mathematician and a great organizer who happens to be a woman, but is a very active militant for women's inclusion in mathematics.

This is but one sign. A few months ago, Ingrid Daubechies, a young mother of two toddlers, became the first woman full professor of mathematics at Princeton University, where, for the first time in its history, half a dozen young women at different ranks are teaching (and doing!) math.

So, some people argue, "You see, it was a matter of time, things are improving, why do you persist with your sessions on women in math?"

Well, why indeed. One reason is that what has been achieved, although considerable — against the bleak background of a field where women were invisible only a few years ago — is still quite modest. More importantly, what has been achieved can be reversed, and a slight change of social climate can provide a good pretext for such reversal. The current powerful drives against affirmative action both in the United States and in Canada are a case in point. Examples show that when there are no reminders about women mathematicians, colleagues tend not to "remember" us.

Just one such example: the invited participation of women in the International Congresses of Mathematicians (ICMs). Singular, yet illustrative of the general situation of women in math and how we may be ignored. In more than a century of ICMs there had been no women plenary speakers until 1932 (Emmy Noether), and not another one until 1990 (Karen Uhlenbeck). Before the 80's only a handful of women were among the hundreds of invited speakers. After a public protest at ICM 78

on the systematic omission, a few women were invited to speak at ICM 82 (which met in Warsaw in 1983). But no further reminder about women was made there, and none were initially invited to ICM 86, resulting in new protests, some late invitations, and more women at ICM 90. Finally, in 1990, the International Mathematical Union (IMU) passed a resolution "to take into account that many qualified women were available as speakers for ICM 94." This brought to the latest ICM the unprecedented number of ten women invited speakers (out of a total of a hundred and sixty five lecturers), two of them delivering plenary lectures. At every ICM which was not preceded by an explicit reminder to consider women candidates, many outstanding mathematicians were passed over.

This historical sequence points to two needs: to alert the community about women's existence and to make constant reminders.

Was the "reminder resolution" of IMU a call to overlook standards? The larger representation of women at ICM 94 in no way diluted its mathematical quality. On the contrary, the plenary addresses of Ingrid Daubechies and Marina Ratner at Zurich were indisputably among the best. No chauvinistic critic challenged, at least publicly, the excellence of women's contributions.

The discrimination against women had been generic, not specific or personal. Yet it had not disappeared, as suggested by the numbers, and there seemed to be an invisible "quota system." The eight women non-plenary speakers lectured in eight of the seventeen sessions, *one in each session*. It seemed as if the selection panels, although aware enough to consider women candidates, felt that they had filled their duty as soon as the first one accepted. And this is not an isolated occurrence.

A personal anecdote: Years ago, a friendly colleague told me his department was considering hiring a junior person in our field and asked me for a top candidate. After some thought I mentioned one of the best junior researchers in the field. His answer was "But we already have a woman!" and mine to him, "So, would you hire a man for the job? I assume your faculty already has at least one man!"

Do women need "special treatment" not to be overlooked? For a variety of reasons, not all of them obvious, the answer seems to be yes. And it

provides the rationale for the prizes, honorary lectures and mathematical events "for women only." Is that "reverse discrimination?" I don't think so.

Both the American and the Canadian Mathematical Societies have recently instituted new honors specially designated for women. Let me analyze the example of the Ruth Satter Prize of the AMS, dedicated by the well-known mathematician Joan Birman to the memory of her sister, a chemist. Many people frowned at a prize for women mathematicians. Don't we have enough prizes in the Society? Don't they go to deserving people? Yes to both questions! But none of them have gone to women. Is it because there are no deserving women candidates? Maybe so, but when the Satter Prize went first to Dusa McDuff — later elected FRS (Fellow of the Royal Society) — and then to Lai-Sang Young and to Sun-Yung Alice Chang, each a leader in her field, nobody felt there had been the dreaded "lowering of standards." These are top researchers, worthy of the highest honors, that could compete for any prize. But it took the creation of the Satter Prize to highlight their achievements.

These recognitions have an educational effect on the mathematical community. Not only do some individuals get their due, but more significantly, their merits are explained and publicized. Thus our whole community learns that there are women who have made outstanding contributions, and what those contributions are. This is especially important in the case of younger people, like Lai-San Young, who had already influenced their fields, but who may not have been recognized outside them.

Recognition is important if we want to reach the people who do not want to discriminate, but who cannot remember the name of a woman mathematician when the time comes to make a nomination for an editorial board or a selection committee.

And let's be fair. How is it with each of us? I can speak from experience. It required conscientious training to "remember" women every time I had to put together a conference or a program. I knew only men! Well then, look for women, even if you do not know them personally. Chances are that you do not know them because nobody else "remembers" them, so they go to fewer places where they can meet others.

Do we need to go to extra lengths to find suitable speakers who happen to belong to underrepresented groups? Absolutely *yes*. The fact that the first name that comes to mind is that of somebody well known, who happens to be white and male, should make us

automatically think about what other person, who happens to be non-white and/or female and not as well known, would make us proud to bring to the same event.

The problem is *not* so much those diehard retrogrades who hate women intellectuals on principle and talk about our less-developed brains and our innate inferiority. The problem is the honest people who insist they do not discriminate and are against quotas (those favoring women and minorities, mind you) and who may earnestly think that everything will be okay if only we ignore the issue, and just use initials before last names to conceal gender.

The problem is the good guys of both genders who are not trained to be good enough. To them we have to provide information and the opportunities to get in contact with women mathematicians whom they can admire, as well as women colleagues they have to respect. And then ask everybody to remember every day that there are people who may be different from them, yet still love to do what we love to do: mathematics.

A question often asked when discussing affirmative action measures toward women and other underrepresented groups is "Will they feel demeaned by being included through such a measure?"

Many times I had friends telling me "Certainly you'd be offended to receive an offer because of your gender and not your mathematics!" Sure I would, if the offer was not appropriate to the level of my mathematics. But I would find it much more offensive if an offer for which I was mathematically competent did not come because of my gender!

As I favor affirmative action measures, let me be explicit about my own "golden rule": to accept each opportunity that one deserves; to reject any exaggerated offer that would make one stick out as a "token" and is thus made just to fulfill some real or imaginary "quota." Of course, one needs a high level of self-confidence to follow such a rule, and self-confidence is much less abundant among young women mathematicians than among their male counterparts.

This lack of confidence does not come about by chance. Many women have faced a lifetime of suspicion about their talent, their commitment to work, their credentials. So, how would they feel about getting a job just because there is an opening in a "female slot?" Badly, unless they join a group that wants them and wants to take advantage of such a slot as a gain to the group. Thus the solution is

much more up to the group than to the individual, and there is where education is needed.

Senior women can make a difference. For instance, by not frowning at special programs for women, but taking advantage of them and, thus, making them acceptable, and even desirable, for younger women.

Let me, through an example, be specific here. In 1982 the National Science Foundation started a program of Visiting Professorships for Women in Science and Technology, which yearly sponsors a score of women to visit top institutions. This program highlights the existence of women scientists in places where there are few or no women faculty. It has enabled, for instance, outstanding women engineers working outside academia to teach engineering students who had *never* encountered a woman engineer before. In the case of mathematics, it provided a great opportunity for financial support for women researchers to work at top institutions.

But at first it took some courage to apply! Who wanted to be singled-out as going places "as a woman?" Fortunately, "somebody" did, the opportunity was put to good use, no stigma was attached, and soon the numbers soared. Now the list of past recipients of this award looks like a "who's who" of women mathematicians in the U.S. It became prestigious, and some institutions offer it as a possibility (which is obviously to their own advantage, since someone else pays) to the mathematicians they want to invite and who happen to be women.

So, the program turned out to become a successful way to have more women at institutions where they will be well received, where they will highlight the existence of women researchers to predominantly male faculties and to graduate students of both genders, and where they themselves will have excellent research opportunities.

Affirmative action programs of this sort are useful, economical, and produce a lot of good, both to individuals and to their communities. It is up to us to see that they do not disappear in the current anti-affirmative-action hysteria sweeping the United States, and that, on the contrary, they are increased at various levels of the educational and research pipelines.

The gains of recent decades could be wiped out in one generation, just as the ICM program committees forgot to invite women as soon as the reminding pressure was relaxed.

We have achieved much. But we are striving for nothing less than the right of all people to do

mathematics. For that we have to work together, women and men, so that the mathematical community is weaned from the need for constant reminders of the existence of women in its midst.

When the biggest affirmative action effort in the history of humankind — that favoring white males — ceases, no further affirmative action will be needed and we will all have more time to concentrate on mathematics.

HUDSON RIVER CONFERENCE

The Second Annual Hudson River Undergraduate Mathematics Conference took place on April 8, 1995 at Siena College in Loudonville, NY. Over 280 participants coming from 37 schools from throughout New England converged on the Siena campus for a day of mathematics. A total of 62 students and 17 faculty gave 15-minute talks in overlapping sessions. Talk topics covered the spectrum of mathematics and statistics, with titles such as: "Determining How Much to Weigh Recent Performances when Predicting the Outcome of NFL Games," "Modeling Information Diffusion on the Internet," and "Searching for Large Primes." Talks varied from exposition to current research in which the students were involved. Sessions were held in Graph Theory and Combinatorics, Number Theory, Abstract Algebra, Applied Mathematics, Geometry and Curvature, History and Pedagogy, Linear Algebra, Social Choice and Fair Division, Computer Science, Knot Theory, Statistics, Recreational Mathematics, and Topology and Logic.

The keynote speaker was Jean Taylor, Rutgers University. Speaking after the lunch provided by the conference, she gave an address entitled "Crystal Growth Models: Theory and Computation." It offered the audience a multimedia introduction to this fascinating area of investigation.

Almost 60 percent of the students were participating in their first math conference, and the majority of the student speakers were giving their first talk at a conference. Over half of the participants were women.

Colin Adams, Williams College

Students were thrilled to find themselves with so many others with a common interest in mathematics. To quote from a student's written comments:

I was exposed to so many inspiring ideas here, my only complaint is that this convention does not last longer. It's great to be at a mathematical convention where I can understand a great amount of the material presented.

The conference was organized by Emelie Kenney of Siena College, Gove Effinger and David Vella of Skidmore College, Frank Morgan of Williams College, William Zwicker of Union College and the author. Funding for the conference came from the National Science Foundation and the GE Fund, with additional support from the American Institute of Certified Public Accountants, the American Mathematical Society, the American Statistical Association, the Association for Women in Mathematics, the Institute for Operations Research and the Management Sciences, the Mathematical Association of America and the Peace Corps. The 1996 Hudson River Undergraduate Mathematics Conference will be held at Skidmore College in Saratoga Springs, NY on April 20, 1996. The keynote speaker will be Ron Graham, Bell Labs.

MSRI OPPORTUNITIES

The mathematical community is invited to attend the special events at the Mathematical Sciences Research Institute for 1995–96. The Several Complex Variables Program will be held all year; the Holomorphic Spaces Program, in Fall 1995 and the Convex Geometry and Geometric Functional Analysis Program, in Spring 1996.

Applications are invited for Postdoctoral Fellowships (Ph.D. awarded 1991 or later; deadline: **September 30, 1995**), Research Professorships (midcareer, Ph.D. awarded 1990 or earlier; deadline: **November 30, 1995**) and General Memberships (members at this level are expected to come with partial or full support from other sources; deadline: **November 30, 1995**) for 1996–97. There will be full-year programs in combinatorics and in low-dimensional topology.

For more information, write: MSRI, 1000 Centennial Drive, Berkeley, CA 94720. Information about the 1995–96 workshops is available via <http://www.msri.org/sched/schedule.html>. Applications for 1996–97 are available via email at send-application@msri.org.



Joanna Barnes, Kariane Calta and Deborah Greilsheimer, three Williams College students at the conference luncheon (photo by Faan Tone Liu)

CALL FOR NOMINATIONS: THE LOUISE HAY AWARD

The Executive Committee of the Association for Women in Mathematics has established the Louise Hay Award for Contributions to Mathematics Education, to be given annually to a woman at the January Business Meeting. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The awardee will be selected by a committee appointed by the President and will receive a citation at the AWM Business Meeting.

While Louise Hay was widely recognized for her contributions to mathematical logic and for her strong leadership as Head of the Department of Mathematics, Statistics, and Computer Science at the University of Illinois at Chicago, her devotion to students and her lifelong commitment to nurturing the talent of young women and men secure her reputation as a consummate educator. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

The letter(s) of nomination should outline the nominee's contributions and indicate both the quality and depth of these contributions. Letters of support from colleagues and/or students are encouraged. *Five* copies of nominations for this award should be sent by **October 1, 1995** to: The Hay Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: (301) 405-7892; email: awm@math.umd.edu. Nominations via email or fax will not be accepted.

BUNTING FELLOWSHIPS

The Mary Ingraham Bunting Institute of Radcliffe College, a multidisciplinary research center, offers fellowships for women scholars, scientists, artists, and writers. Office space, auditing privileges, and access to libraries and most other resources of Radcliffe College and Harvard University are provided. Residence in the Boston area and participation in the Institute community are required during fellowship appointment. Applicants must have held the Ph.D. for at least two years prior to appointment. Stipends for the fellowships listed below are \$34,200 plus \$3,000 in research expenses for an eleven-month appointment, September 15, 1996 through August 15, 1997. The application deadline is **October 15, 1995** (postmarked). For applications, contact: 34 Concord Avenue, Cambridge, MA 02138; phone: (617) 495-8212; email: Bunting_fellowships@radcliffe.harvard.edu.

The Science Scholars Fellowship Program (funded by the Office of Naval Research; applicants must be U.S. citizens) is open to women in fields of astronomy, molecular and cellular biology, biochemistry, chemistry, cognitive and neural sciences, computer science, electrical engineering, aerospace/mechanical engineering, geology, materials science, mathematics, physics, naval architecture and ocean engineering, oceanography, and all fields that relate to the study of oceans. The Biomedical Research Fellowship Program (funded by the

Burroughs Wellcome Fund; applicants must be U.S. citizens or permanent residents) is open to women in all fields of biomedical research.

ERA-AMS

The AMS is making the Society's first electronic-only journal available free of charge on the Internet. This puts the AMS several months ahead of other scientific societies in providing free access to refereed electronic journals.

The new journal, *Electronic Research Announcements of the AMS (ERA-AMS)*, carries short articles informing a broad mathematical audience of significant new breakthroughs in the field; it covers all areas of mathematics, as well as applied areas such as mathematical biology and theoretical physics. Having research announcements online allows for much timelier dissemination and the potential for a wider audience than with a print publication.

ERA-AMS has a 26-person editorial board, and submissions undergo the usual peer review process used for print publications. Authors can submit papers in email or via ftp.

Plans are underway to provide electronic access to all of the primary AMS journals.

Check out the e-MATH home page at <http://www.ams.org>.

DID MARIE CURIE'S VISITS TO AMERICA OPEN DOORS FOR WOMEN OR SLAM THEM SHUT? (part I)

Last night, I watched the 1943 movie called *Madame Curie*, starring Greer Garson and Walter Pidgeon. It is a charming movie in many ways, and it does certainly give Marie Curie much of the credit for the discoveries she made with her husband. But there is a moment in it which exemplifies the question I want to discuss today. Marie and Pierre Curie are in the midst of their exciting research on radioactivity and are appearing before an august committee of the Sorbonne to ask for funding. One of the members of the committee notes that Madame Curie is not only young and inexperienced, but she is also a woman. Pierre Curie rises in indignation. "Gentleman!" he says. "It is true that she is a woman, but she is not like most women. She is *exceptional*. She is *extraordinary*."

Some have argued that this view of Marie Curie actually created a barrier to the progress of other women in the sciences. Particularly during her visit to the United States in 1921 she was so celebrated and her greatness was so exaggerated that she became an unreal superwoman. Historian of science Margaret Rossiter claims, in *Women Scientists in America*, that Marie Curie's visits to the United States, far from opening doors, simply raised the threshold for women entering science. In the twenties and thirties, according to Rossiter, women scientists came to believe that, in order to succeed, they had to be "Madame Curies." They "adopted a new, more conservative, and less confrontational strategy of deliberate overqualification and personal stoicism."¹ Rossiter calls this the "Madame Curie strategy." In her view, Marie Curie's 1921 tour of America actually set women back.

This is the question I want to address today: did Marie Curie's visit to America, one of the greatest PR campaigns of the day, inspire and lead women into science? Or did it provide an excuse for keeping them out — the excuse that "we can't all be Madame Curies?" And, on a more personal level, did Marie Curie herself, two-time winner of the Nobel Prize, do anything to bring along other women who were interested in science?

Before getting into those questions, let me briefly sketch the outlines of Marie Curie's life:

She was born Maria Skłodowska in Warsaw Poland in 1867, the youngest of five children. Her parents were educators, part of the Warsaw *intelligentsia* who came from the formerly landed gentry. Her mother died of TB when she was ten. Nonetheless, both parents exerted a powerful influence on their youngest child. Poles at the time lived under the oppressive rule of the Russian czars, and the children were raised with the strong belief that they must resist the oppressors and restore Poland to sovereignty in any way possible. I believe this apprenticeship in resisting authority contributed to Maria's ability to stand up to the male establishment later on.

She was a brilliant student in Warsaw, graduating from gymnasium at the top of her class. But university was closed to women in Poland. So she and her sister Bronia made an unusual pact: Bronia would go to Paris to study medicine and Maria would stay behind, supporting her as a governess. Then, when Bronia finished, it would be Maria's turn to study. Amazingly, the sisters carried out their plan. At age 23, after working seven long years as a governess, Maria travelled to Paris to study science at the Sorbonne. As a woman, she was in a tiny minority. In 1893, when she received her first degree in science, she was one of three women among 9000 degree recipients. The following year, when she received a second degree in mathematics, she was one of five.

That same year, she met Pierre Curie, an older scientist with important accomplishments to his credit. They married and lived happily together for eleven years. During those years, Marie (as she was now called) bore two children and continued to work intensely in science. Her Ph.D. thesis, which was to be an investigation of the energy Becquerel had detected in uranium, turned into a much broader survey and the discovery not only of the elements polonium (for Poland) and radium, but also of the more general phenomenon of radioactivity. For this work, Pierre, Marie, and Henri Becquerel were awarded the 1903 Nobel Prize in physics.

Three years later, Pierre Curie was killed in a street accident. Marie was devastated and deeply depressed for many months. His death was followed

Talk delivered at Brandeis to the Women's Science Group by Susan Quinn, the author of Marie Curie: A Life.

by more reversals. In 1910, she attempted to become a member of the Académie des sciences and was rejected because she was a woman. Meanwhile, she had begun an affair with Paul Langevin, a colleague who had been one of Pierre's closest friends and who was unhappily married. Langevin's jealous wife got hold of the love letters between Marie Curie and Paul Langevin and took them to the papers. The result was a great scandal, in which Marie Curie was vilified as a foreign woman and a home-wrecker. There was talk of asking her to leave the Sorbonne and return to Poland. In the midst of the scandal it was announced that she had been given the 1911 Nobel Prize in chemistry for her work in isolating radium. Then, after the letters were published, one member of the Swedish academy asked her to withdraw until she had cleared her name. She refused and went to Sweden to collect her prize. But the scandal left her ill and devastated. It wasn't until World War I that she regained some of her zest for life. At that time, she organized a fleet of X-Ray cars that went to the front to aid in the emergency care of wounded soldiers.

It wasn't until after the war that Marie Curie began to assume legendary status. And no one was more instrumental in this legend-making process than were the Americans.

The world war had given America new importance in the eyes of Europeans. U.S. troops, joining the conflict late, were seen by some as rescuers of a depleted Allied force. America, compared to a physically and economically devastated Europe, was more than ever a land of plenty. It was also a land where women, as of 1920, had won the right to vote.

This was the unspoken but critical context in which Marie "Missy" Meloney, an editor of an American women's magazine, paid a visit to Marie Curie on a fateful day in May of 1920, two years after the war's end. Afterward Missy, as everyone called her, described her visit.

I waited a few minutes in a bare little office which might have been furnished from Grand Rapids, Michigan. Then the door opened and I saw a pale, timid little woman in a black cotton dress, with the saddest face I had ever looked upon.... Her kind, patient, beautiful face had the detached expression of a scholar. Suddenly I felt like an intruder. I was struck dumb. My timidity exceeded her own. I had been a trained interrogator for twenty years, but I could not ask a single question of this gentle woman in a black cotton dress.²

With these introductory words, Missy goes to work, constructing the legend. A great woman, but also a humble woman was this idealized Marie Curie — no strident feminist or careerist she. Rather she was the tragic widow, self-sacrificing, detached from the material world, and above all impoverished. A few weeks before, Marie Meloney had seen Edison's laboratory and found him "rich in material things — as he should be." She had grown up near Alexander Graham Bell and "admired his great house and his fine horses." She was expecting to find Marie Curie installed "in one of the white palaces of the Champs d'Elysées." Instead here she was face to face with "a simple woman, working in an inadequate laboratory and living in a simple apartment on the meager pay of a French professor."³ Very soon, Missy Meloney came to the conclusion that she was going to find a way to help.

The story of Missy Meloney's campaign for Marie Curie in America is usually told as though it was all Missy's idea. The retiring scientist, it is said, was completely overwhelmed by the enthusiasm and energy of the journalist. Marie Meloney was simply an unstoppable force. Even Marie Curie tended to view the whole American encounter in that light.

But this is too simple. Marie Curie could be — as Einstein noted — enormously stubborn. When it came to requests and propositions she found unworthy or pointless, she knew how to say no and did so more often than not. The archive at the Bibliothèque nationale in Paris is full of letters of refusal, typed in later years by a secretary. "Madame Curie is unable to accept ...," etc. There was something about Missy Meloney, and about what she had to offer, that appealed to Marie Curie.

Early on, Marie Curie seemed to sense that Meloney might know the way to unlock some of America's wealth for her. "To put me at my ease," Meloney related afterward, "Madame Curie began to talk about America." She spoke of her wish to visit there; then she went on to talk about radium.

"America," she said, "has about fifty grammes of radium. Four of these are in Baltimore, six in Denver, seven in New York." She went on naming the location of every grain.

"And in France?" I asked.

"My laboratory," she replied simply, "has hardly more than a gramme."⁴

It didn't take much effort for Missy to figure out that a gram of radium from America would be a welcome addition to Marie Curie's laboratory.

Still it would be wrong to suggest that Marie Curie was simply using Missy, just as it would be wrong to suggest the opposite. Marie Curie liked, and grew to love, Missy Meloney, a small, frail woman with a slight limp and large black eyes set in a "lovely pale face."⁵ Eleven years younger than Marie Curie, Marie Mattingly was born in Kentucky, the daughter of a doctor who had conducted research on tetanus. Her mother, the doctor's third wife, was an unusual woman for her time, a college graduate who established a school for freed black slaves in 1876.

Her daughter Marie — Missy — became a full-time journalist at seventeen, when she joined the staff of the *Washington Post*. She married an editor, William Brown Meloney, with whom she had one child. Shortly before her encounter with Marie Curie, she became editor of *The Delineator*, one of the six major women's magazines of the period, and it was there that she orchestrated the campaign to raise \$100,000 to buy Marie Curie, "The Greatest Woman in the World," a gram of radium.⁶

Always, when she spoke of her to other friends, Marie Curie emphasized how "sincere" Missy was, how concerned for her. And Missy was sincere in her own way. She idolized and adored Marie Curie, and said so often. Perhaps because of the humiliations she had suffered during the Langevin affair, Marie Curie seems to have been particularly susceptible during this period of her life to such hero worship. As a result, she tended to overlook the ways in which Missy's articles and fund-raising were creating a fictional version of her life and circumstances — a version which suited Missy's purposes but which in the end would complicate her own.

Despite the example of her pioneering mother and despite her own successful career, Missy seems to have been politically and socially conservative. She herself had left work for ten years to care for her child. Once, she sent Marie Curie a book she admired called *This Freedom*, by A.S.M. Hutchinson. It is a poisonous piece of fiction about a mother whose three children are destroyed — one becomes a criminal, one dies from a botched abortion, and one commits suicide — all because their mother goes back to work.

Marie Curie wrote Missy that she disagreed with the book. "I agree, of course, that it is not easy for a

woman to bring up children and to work out of home," she wrote in her careful English, "but I don't believe either that the author is right in his conclusion.... I don't think that he has considered the rich women who leave the children to a governess and give most of their time to visits and dresses. And of course he never gave a thought to the condition of poor women, peasants or factory workers, who could not stop working, even if they wished ever so much."⁷

Missy, however, was oblivious to differences between her views of motherhood and her idol's. In the issue of April, 1921, which was largely devoted to the life and work of Marie Curie, Missy's lead article described her as "a woman of rare beauty whose face has suffering and patience in it. It has the mother look." Later in the same article, she quoted Marie Curie's explanation that she could not come to America because she could not leave her children. Missy comments, "A volume in that sentence. She could not leave her children."

But this idea of Marie Curie hovering over her daughters is ridiculous. Some might even say that Marie's long absences from Eve, during which she was cared for by friends and governesses, bordered on neglect. But it is what Missy Meloney wanted to believe and succeeded in getting others to believe. It coincided nicely with a conservative backlash against feminism following the leap forward provided by the war and suffrage.

Another piece of the myth which would make mischief for Marie Curie was the idea that she was impoverished. In fact, in the postwar years, Marie Curie was better off than most other scientists in France. "It is true," she wrote Missy, in an effort to temper her exaggerations, "that I am not rich, but that is nearly always so for French scientists, and I live like other professors of the University; so I don't complain or feel unhappy about it."⁸

But the whole campaign, and Missy's role in it, depended on Marie's being deprived and neglected. *The Delineator*, though devoted largely to fashion, sentimental fiction and modernity in the home, had been publishing stories for some time on devastated towns and villages in war-scarred France. And at the end of each article, there was information about how to help, by sending a check to the magazine's "French-Relief Editor." Helping Marie Curie, a personification of ravaged France, would fit well with *The Delineator's* charitable image.

— to be continued —

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BROWN UNIVERSITY - MATHEMATICS DEPARTMENT - One professorship at the Associate Professor level, with tenure to begin July 1, 1996. Preference to be given to applicants with research interests consonant with those of the present members of the Department. We are especially looking for candidates in the general area of geometry, broadly construed, but exceptional candidates in all fields will be seriously considered. Candidates should have a distinguished research record and a strong commitment to teaching. Qualified individuals are invited to send a vitae and arrange for at least five letters of recommendation to be forwarded to: **Professor Joseph Silverman (Senior Search Committee), Department of Mathematics, Brown University, Box 1917, Providence, Rhode Island 02912.** Applications must be received by January 15, 1996, in order to receive consideration. Brown University is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and minorities.

CALIFORNIA POLYTECHNIC STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Mathematics Education - Tenure-track beginning Fall 1996. Assistant (preferred) or Associate Professor (\$35,868 to \$45,216). Responsibilities include teaching methods courses for prospective K-12 teachers, supervising student teachers and senior projects, and teaching mathematics courses. Doctorate in mathematics education with the equivalent of a masters degree in mathematics, or doctorate in mathematics, is required. Pre-college teaching experience and a background in educational technology and assessment is desired. Send letter of application, résumé, professional goals, three letters of reference, and transcript (unofficial okay initially) to: **Chair, Screening Committee, Mathematics Department, Cal Poly, San Luis Obispo, CA 93407. Indicate Recruitment Code 63006 on all correspondence.** Closing date: December 15, 1995. Cal Poly is strongly committed to achieving excellence through cultural diversity. The university actively encourages applications and nominations of women, persons of color, applicants with disabilities, and members of other underrepresented groups. AA/EEO.

CARLETON COLLEGE - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - The Carleton College Department of Mathematics and Computer Science has one tenure-track position to begin September 1996. A Ph.D. in Statistics or Mathematics is required and evidence of teaching excellence is essential. We seek candidates with experience and interest in the current reform efforts in undergraduate statistics education and in recent computer-intensive statistical methods. Professional goals should include statistics and statistical education. Review of applications will begin December 1, 1995 and will continue until the position is filled, but those received after February 1, 1996 might not receive consideration. Carleton faculty teach 2 courses per term, 3 terms per 9-month year. Carleton is an Affirmative Action/Equal Opportunity Employer; applications are specifically invited from women and members of traditionally underrepresented groups. Send letter of application, a statement of teaching philosophy, résumé, graduate transcript(s), and three recent letters of reference, at least one of which should address teaching, to: **Rich Nau, Chair, Department of Mathematics and Computer Science, One North College Street, Northfield, MN 55057-4025** (e-mail: search96@mathcs.carleton.edu). For general information about Carleton, the department and the position see <http://www.mathcs.carleton.edu>. Carleton is a highly selective liberal arts college 35 miles south of Minneapolis/St. Paul. The department has 12 full-time members. A commitment to teaching in a liberal arts setting is essential. Research is supported and encouraged. Computing resources available to the department include four teaching laboratories equipped with Mac Quadras, NeXts, 486 PC's, Silicon Graphics workstations, transporter-equipped parallel processing stations, and access to a central VAX cluster and the internet.

COLBY COLLEGE - DEPARTMENT OF MATHEMATICS - Tenure Track Position in Applied Mathematics - We have a tenure-track opening in mathematics at the assistant professor level, commencing September 1, 1996. Ph.D. required. We are looking for someone with credentials and/or experience in applied mathematics. Individuals working in one of the areas of control theory, game theory, mathematical modeling, mathematical visualizations, numerical analysis, operations research, ordinary differential equations, or partial differential equations are preferred. The salary is competitive, and based on experience. Colby is a small, private highly selective liberal arts college located in central Maine. The student body numbers some 1,700, the faculty 165. The Department of Mathematics and Computer Science currently numbers nine full-time and two part-time, all of whom have the Ph.D. We have major and minor programs in mathematics and computer science. We are a young, active department, which places a high value on both teaching and research. Therefore, candidates who are able to demonstrate excellence in teaching are likely to be ranked higher in our selection process. The annual teaching load is 5 courses. The largest class size is approximately 30. We will be interviewing at the Joint Mathematics Meetings on January 10-13, 1996, in Orlando, Florida. Send a cover letter, a current curriculum vitae, and separate statements on teaching and research in hard copy to: **Fernando Gouvea, Applied Math Hiring Committee, Department of Mathematics and Computer Science, Colby College, Waterville, ME 04901** (fgouvea@colby.edu). Please include your e-mail address. Also, arrange for three letters of reference to be sent to the same address. These letters should deal with both your research and your teaching abilities. Review of applications will begin on December 1, 1995. To guarantee full consideration, all application materials must be received by December 1, 1995. Colby actively encourage applications from women and minority candidates. We are an EO/AA employer.

COLBY COLLEGE - DEPARTMENT OF MATHEMATICS - Tenure Track Position in Statistics - We have a tenure-track opening in statistics at the assistant professor level, commencing September 1, 1996. Ph.D. in statistics or equivalent experience required. Candidate must be able to teach some mathematics courses as well as statistics courses. The salary is competitive, and based on experience. Colby is a small, private highly selective liberal arts college located in central Maine. The student body numbers some 1,700, the faculty 165. The Department of Mathematics and Computer Science currently numbers nine full-time and two part-time, all of whom have the Ph.D. We are a young, active department, which places a high value on both teaching and research. We have major and minor programs in mathematics and computer science, but not in statistics. The annual teaching load is 5 courses. The largest class size is approximately 30. The typical annual teaching assignment for the person filling this position will consist of 3 or 4 statistics classes and 1 or 2 mathematics classes. Candidates who are able to demonstrate excellence in teaching mathematics and statistics are likely to be ranked higher in our selection process. Send a cover letter, a current curriculum vitae, and separate statements on teaching and research in hard copy to: **H.T. Hayslett, Jr., Chair, Statistics Hiring Committee, Department of Mathematics and Computer Science, Colby College, Waterville, ME 04901** (hthaysle@colby.edu). Also, arrange for three letters of reference to be sent to the same address. These letters should deal with both your research and your teaching abilities. Please include your e-mail address with your application and indicate whether you are planning on attending the Joint Mathematics Meetings on January 10-13, 1996, in Orlando, Florida. Review of applications will begin January 1, 1996. To guarantee full consideration, all application materials must be received by January 1, 1996. Colby actively encourages applications from women and minority candidates. We are an EO/AA employer.

THE GEOMETRY CENTER, UNIVERSITY OF MINNESOTA, MINNEAPOLIS - Postdoctoral Research and Training Fellowships - The Geometry Center is the NSF Science and Technology Research Center for Computation and Visualization of Geometric Structures. The Center has created a unified mathematics computing environment supporting math and computer science research, mathematical visualization, software and tool development, application development, video animation production, and K-16 math education and outreach. Up to five fellowships will be awarded for the academic year 1996-97. They are for one year with the possibility of a one-year renewal by mutual agreement. Remuneration will be \$40,000/twelve months if there is not other support. Applicants are expected to demonstrate a high level of research accomplishment in the mathematical or computer sciences, to demonstrate an active interest in educational innovation, and to be at home in a computing environment. Postdocs are expected to participate fully in the Center's activities, which encompass research, education, technological development, and outreach. To apply: send a vita, send a statement specifically addressing your interest in the Geometry Center, and arrange for three letters of recommendation, at least one of which specifically addresses your application to the Geometry Center, to be sent directly to us. Applications from underrepresented groups are specifically encouraged. Application materials should be sent preferably by e-mail to: **postdoc_appl@geom.umn.edu** or by surface mail to: **Postdoc Applications, The Geometry Center, University of Minnesota, Suite 500, 1300 South Second Street, Minneapolis, MN 55454.** The deadline for applications is June 30, 1996, although the search committee will meet in January 1996 to review applications which have been received by December 31, 1995. The University of Minnesota is an equal opportunity educator and employer.

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INSTITUTE FOR ADVANCED STUDY - SCHOOL OF MATHEMATICS - The School of Mathematics will grant a limited number of memberships, some with financial support, for research in mathematics at the Institute during the academic year 1996-97. Candidates must have given evidence of ability in research comparable at least with that expected for the Ph.D. degree. During the 1996-97 academic year David Kazhdan will be the Distinguished Visiting Professor, and there will be a special program on algebraic and geometric aspects of quantum field theory and gauge theory. Applications may be obtained from: **The School of Mathematics, Attention Richard Lloyd, Institute for Advanced Study, Olden Lane, Princeton, NJ 08540.** (E-mail address: lloyd@math.ias.edu) and should be returned by December 1, 1995. The Institute is an Equal Opportunity/Affirmative Action Employer and encourages applications from women and minorities.

INSTITUTE FOR MATHEMATICS AND ITS APPLICATIONS - UNIVERSITY OF MINNESOTA, MINNEAPOLIS - Program on Mathematics in High Performance Computing. This is a one-year program with three parts: (1) **FALL:** September - December, 1996, The Mathematics of Computing and Communication; (2) **WINTER:** January - March, 1997, Molecular Modeling and HPC; (3) **SPRING:** April - June, 1997, Parallel Computational Mechanics. **POSTDOCTORAL MEMBERSHIPS:** All requirements for a doctorate should be completed by September 1, 1996. Applicants must show evidence of mathematical excellence, but they do not need to be specialist in the field. The following materials must be submitted (all material should arrive by January 15, 1996): (1) Personal statement of scientific interests, research plans, and reasons for wishing to participate in the Mathematics in High Performance Computing. (This is an essential part of the application.) (2) Curriculum vitae and a list of publications. (3) Three letters of recommendation, to be sent directly to the IMA. **SENIOR MEMBERSHIPS:** Preference will be given to supplementary support for persons with sabbatical leaves, fellowships, or other stipends. **POSTDOCTORATES IN INDUSTRIAL MATHEMATICS:** IMA announces up to 6 one-to-two year positions in Industrial Mathematics, effective September 1, 1996. These appointments are in addition to the regular program and are funded jointly by the NSF and participating industries. They are designed to prepare mathematicians for research careers involving industrial interaction. Applicants should have fulfilled all requirements for a Ph.D. in Mathematics or Applied Mathematics by September 1, 1996. Familiarity with pde and/or numerical analysis and/or statistics is desired, but no knowledge in engineering is required. Postdoctorates will spend 50% effort working with industrial scientists on one of the following or related topics: (1) Signal processing and computational ocean acoustics; (2) Diffractive and nonlinear optics; Maxwell equations in periodic structure; (3) Computational fluid mechanics; (4) Scattering of electromagnetic waves from complex objects; (5) Magneto-optic recording media; the writing process; (6) Semiconductors; (7) Solid state physics & computational chemical physics; (8) Problems in mathematical photography; (9) Air quality modeling; (10) Control theory; (11) Imaging analysis; (12) Micromagnetics; (13) Near-infrared imaging; (14) Applied statistical information theory and data fusion; and 50% effort in the regular IMA program. Requirements and application procedure are the same as for the postdoctoral memberships listed above. The University of Minnesota is an equal opportunity educator and employer. The application forms are available via: gopher.ima.umn.edu, <http://www.ima.umn.edu> or call (612)624-6066. All correspondence should be sent to either: **VISITING MEMBERSHIP COMMITTEE or INDUSTRIAL MATHEMATICS POSTDOCTORATE MEMBERSHIP COMMITTEE, Institute for Mathematics and its Applications, University of Minnesota, 514 Vincent Hall, 206 Church St. S.E., Minneapolis, MN 55455-0436.**

MACALESTER COLLEGE - MATHEMATICS AND COMPUTER SCIENCE DEPARTMENT - Applications are invited for two tenure-track positions in Mathematics beginning Fall 1996. Candidates must have the Ph.D. and a commitment to teaching and research in an undergraduate liberal arts environment. Preference will be given to candidates with post-graduate teaching experience and research interests in applied mathematics, dynamical systems, geometry, or algebra. Macalester is a premiere liberal arts college located in the twin cities of Minneapolis-St. Paul. Part of a vigorous science presence on campus, the Mathematics and Computer Science Department has traditionally attracted strong students. Applicants should send résumé, statements of research and teaching interests, and have three letters of reference sent to: **David Bressoud, Math/CS Dept., Macalester College, St. Paul, MN 55105.** Evaluation of applications will begin December 1, 1995 and continue until the positions are filled. Macalester is an Affirmative Action/Equal Opportunity employer. Women and members of minority groups are especially encouraged to apply.

MICHIGAN STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department is seeking applicants for tenure track positions to begin in the Fall 1996, pending approval. The positions are expected to be at the Assistant Professor level, but exceptional applicants for a higher rank may be considered. Excellence in research and teaching is essential, and two or more years beyond the Ph.D. is expected. **Application via e-mail is strongly encouraged; contact: jobs@math.msu.edu with a message containing "send application-info".** Applicants must submit a résumé and arrange for at least three letters of recommendation to be sent. Application materials can also be addressed to: **The Hiring Committee, Department of Mathematics, Michigan State University, East Lansing, MI 48824-1027.** Application should be made as soon as possible since candidate screening will begin in October. Completed applications received by November 1, 1995 are assured of consideration. Women and minorities are strongly encouraged to apply. MSU is an Affirmative Action/Equal Opportunity Institution.

MICHIGAN STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Pending funding, several two-year positions will be available beginning Fall 1996, for new or recent Ph.D.s. The teaching load is four semester courses per year and participation in the research activities of the department is expected. An applicant should send a vita as well as a brief statement of research interests and arrange to have sent at least three letters of recommendation commenting on the applicant's research and teaching abilities. **Application via e-mail is strongly encouraged. Contact jobs@math.msu.edu with a message containing "send application-info".** Application materials can also be mailed to: **The Hiring Committee, Department of Mathematics, Michigan State University, East Lansing, MI 48824-1027.** The deadline is December 1, 1995. MSU is an Affirmative Action/Equal Opportunity Institution.

NEW MEXICO STATE UNIVERSITY - DEPARTMENT OF MATHEMATICAL SCIENCES - The department invites applications for tenure-track and visiting positions in pure and applied mathematics and statistics for academic year 1996-1997. The department has 32 tenure-track positions, and offers B.S., M.S. and Ph.D. degrees. New tenure-track appointments are expected to be at the assistant professor level. Applicants should demonstrate strong potential for success in both teaching and research. A complete application consists of an introductory letter, the American Mathematical Society's Application Cover Sheet (limited to one page), a curriculum vitae, and three letters of recommendation. The AMS form must clearly identify the candidate's research area and interest in tenure-track or visiting positions. The letters of recommendation should document abilities in both teaching and research. For tenure-track positions, the applicant's letter, vita and AMS form must be received by December 1, 1995. Letters of recommendation received by January 2, 1996 will be used in the screening process. Tenure-track appointments are made during the spring semester; visiting appointments are made as vacancies occur. Application materials should be sent to: **Hiring Committee, Department of Mathematical Sciences, New Mexico State University, Las Cruces, NM 88003.** New Mexico State University is an Equal Opportunity/Affirmative Action Employer.

NORTHERN ILLINOIS UNIVERSITY - DEPARTMENT OF MATHEMATICS - Anticipated assistant professorship with a specialization in numerical partial differential equations. The successful candidate should have a strong numerical component as well as theoretical background in partial differential equations. Ph.D. or equivalent and strong potential in research and teaching required. Application (vita), transcripts, three letters of reference, and a description of research program should be sent to: **Numerical PDE Position, c/o Professor William D. Blair, Chair, Department of Mathematical Sciences, Northern Illinois University, DeKalb, IL 60115** by January 31, 1996. NIU is an Equal Employment Opportunity/Affirmative Action Employer and recognizes dual career issues.

NORTHERN ILLINOIS UNIVERSITY - DEPARTMENT OF MATHEMATICS - Anticipated assistant professorship in mathematics education. Preference will be given to those with domestic public school teaching experience and certifications. Ph.D. or equivalent in mathematics education, mathematics at the master's level, and strong potential in scholarship and teaching required. Application (vita), transcripts, three letters of reference, and a description of scholarly interest should be sent to: **Mathematics Education Position, c/o Professor William D. Blair, Chair, Department of Mathematical Sciences, Northern Illinois University, DeKalb, IL 60115** by January 15, 1996. NIU is an Equal Employment Opportunity/Affirmative Action Employer and recognizes dual career issues.

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NORTHWESTERN UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for an anticipated tenure-track assistant professor position starting September 1996. Priority will be given to exceptional research mathematicians. Fields of interest within the department include Algebra, Analysis, Dynamical Systems, Probability, Partial Differential Equations, and Topology. Northwestern is an affirmative action, equal opportunity employer committed to fostering a diverse faculty; women and minority candidates are especially encouraged to apply. Candidates should arrange to have the application material sent to: **Chairperson, Personnel Committee, Department of Mathematics, Northwestern University, Evanston, Illinois 60208-2730**. Applications should include: (1) the American Mathematical Society's Application Cover Sheet for Academic Employment in Mathematics, (2) a curriculum vita, and (3) at least three letters of recommendation. Inquiries may be sent via e-mail to "hiring@math.nwu.edu." In order to receive full consideration, applications should be received by December 15, 1995.

NORTHWESTERN UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Mathematics Department will sponsor an Emphasis Year in algebraic topology. This program will include two two-year assistant professorship positions starting September 1996 and possible visiting positions for more senior mathematicians for part of the academic year 1996-97, contingent upon availability of funds. Applications should be sent to: **The Emphasis Year Secretary, Department of Mathematics, Northwestern University, Evanston, Illinois 60208-2730**, and include: (1) the American Mathematical Society's Application Cover Sheet for Academic Employment in Mathematics, (2) a curriculum vitae, and (3) three letters of recommendation. Inquiries may be sent via e-mail to "hiring@math.nwu.edu." In order to ensure full consideration, applications should be received by January 15, 1996. Northwestern University is an affirmative action, equal opportunity employer committed to fostering a diverse faculty; women and minority candidates are especially encouraged to apply.

OHIO STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics of The Ohio State University hopes to have available several positions, both visiting and permanent, effective Autumn Quarter 1996. Candidates in all areas of applied and pure mathematics are invited to apply. Significant mathematical research accomplishments or exceptional promise, and evidence of superior teaching ability, will be expected. Please send credentials and have at least three letters of recommendation sent to: **Professor Robert Brown, Department of Mathematics, The Ohio State University, 231 W. 18th Avenue, Columbus, Ohio 43210**. Review of résumés will begin immediately. The Ohio State University is an Equal Opportunity/Affirmative Action employer. Women and minority candidates are encouraged to apply.

PURDUE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Several tenure-track or two-year research assistant professorships beginning August 1996. Ph.D. by August 1996, exceptional research promise, and excellence in teaching required. Possible positions at the Associate Professor/Professor level beginning August 1996. Ph.D. and excellent research and teaching credentials required. Applicants should mention at least one Purdue faculty member with whom they expect to have common research interests. Preference will be given to completed applications received by December 15, 1995. Send curriculum vitae and three letters of recommendation (for assistant professorships, at least one letter should discuss teaching) to: **Leonard Lipshitz, Head, Department of Mathematics, Purdue University, West Lafayette, IN 47907-1395**. Purdue University is an Affirmative Action/Equal Opportunity Employer.

RUTGERS UNIVERSITY, NEWARK - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Assistant Professor of Mathematics - The Department of Mathematics and Computer Science invites applications for an anticipated tenure-track Assistant Professor position in pure mathematics, to begin September 1996. Candidates must have a Ph.D., a strong research record, show outstanding promise for future work in mathematics, and demonstrate a commitment to effective teaching. Preference will be given to candidates with research interests similar to those in the department. Applicants should arrange for a curriculum vitae and at least four letters of recommendation, one of which addresses teaching, to be sent to: **Personnel Committee, Department of Mathematics and Computer Science, Rutgers University, Newark, NJ 07102**. Processing of applications will begin in December 1995. Rutgers University is an equal opportunity/affirmative action employer.

SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE - DEPARTMENT OF MATHEMATICS - Continuing Position - Applications are invited from qualified candidates for a tenure track position at the assistant professor level beginning on August 16, 1996. Ph.D. in mathematics required at the time of application. Preference will be given to applicants in the areas of combinatorics, dynamical systems, ordinary or partial differential equations, probability and topology. Candidates must have demonstrated excellence in research. All applicants must provide evidence of excellence in teaching and evidence of the ability to teach in English effectively. Send letter of application, résumé and three letters of recommendation to: **Continuing Position, c/o Ronald B. Kirk, Chair, Department of Mathematics, Southern Illinois University at Carbondale, Carbondale, IL 62901**. The closing date is October 1, 1995 or until the position is filled. SIUC is an equal opportunity/affirmative action employer. Women and minorities are particularly encouraged to apply.

STATE UNIVERSITY OF NEW YORK AT BUFFALO - DEPARTMENT OF MATHEMATICS - The Department of Mathematics anticipates the appointment of tenured or tenure-track faculty members beginning September 1, 1996. Salary will be competitive. We seek applicants in all areas with excellent research accomplishments/potential and a strong commitment to teaching. Applicants should send supporting information, including a c.v. with a list of research interests, and have four letters of recommendation sent to: **Search Committee Chairman, Department of Mathematics, SUNY/Buffalo, 106 Diefendorf Hall, 3435 Main Street, Buffalo, NY 14214-3093**. No electronic applications will be accepted. The deadline for applications is November 1, 1995. Late applications will be considered until positions are filled. SUNY/Buffalo is an Equal Opportunity/Affirmative Action Employer. We are interested in identifying prospective minority and women candidates. No person, in whatever relationship with the State University of New York at Buffalo shall be subject to discrimination on the basis of age, creed, color, handicap, national origin, race, religion, sex, marital or veteran status.

STATE UNIVERSITY OF NEW YORK COLLEGE AT FREDONIA - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - The Department of Mathematics and Computer Science invites applications for a tenure-track position in mathematics education starting in August 1996 (possibly January 1996) at the rank of assistant professor. A doctorate is required, preferably in mathematics education with specialization in secondary school curriculum, methods or the application of technology. Substantial teaching experience at the secondary school level is also desirable. Since responsibilities of this position included working closely with pre-service and in-service secondary mathematics teachers, our search will be limited to candidates who have at least one of these two qualifications (a doctorate in mathematics education or substantial secondary school teaching experience). Candidates must have a record of and a commitment to excellence in teaching, continued scholarly activity and an interest in curriculum development. Review of applications will commence November 15, 1995 and will continue until the position is filled. Fredonia actively encourages applications from women and minority candidates and is an Affirmative Action/Equal Opportunity Employer. Send a letter of application and a complete curriculum vita to: **Dr. Nancy Boynton, Chair, Search Committee, Mathematics and Computer Science Department, SUNY College at Fredonia, Fredonia, NY 14063-1198, masearch@cs.fredonia.edu**.

TRINITY COLLEGE, HARTFORD - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track assistant professorship, duties of which commence late August 1996. Requirements: Ph.D. in mathematics, strong evidence of research potential, demonstrated success in classroom instruction, and a commitment to undergraduate instruction in a liberal arts setting. Preference given to specialists in logic or geometry. Computer expertise and experience in laboratory calculus are desirable. Send a cover letter, a c.v. (listing a winter-break phone number and an e-mail address if possible), statements on teaching and research interests, and three letters of reference (one of which addresses teaching) to: **Search Committee Chair, Mathematics Department, Trinity College, Hartford, CT 06106**. We also anticipate filling a one-year position, specialization open. Interested parties should so indicate in their cover letter or on the AMS cover sheet. Review of applications will begin December 1, 1995 and will continue until positions are filled. Trinity College is an Equal Opportunity/Affirmative Action employer. Women and minority members are especially encouraged to apply.

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UNIVERSITY OF CALIFORNIA AT BERKELEY - DEPARTMENT OF MATHEMATICS - Charles B. Morrey Jr. Assistant Professorships - We invite applications for these special two-year (non tenure-track) positions effective July 1, 1996. Applicants should have a recent Ph.D., or the equivalent, in an area of pure or applied mathematics. Applicants should send a résumé, reprints, preprints and/or dissertation abstract, and ask three people to send letters of recommendations to: **The Vice Chair for Faculty Affairs, Department of Mathematics, University of California at Berkeley, Berkeley, CA 94720.** We request that applicants use the AMS standardized application form and indicate their subject area using the AMS subject classification numbers. The form is the *Academic Employment in Mathematics, Application Cover Sheet*, it is available courtesy of the American Mathematical Society. We should receive this material no later than December 1, 1995. Applications postmarked after the deadline will not be considered. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA AT BERKELEY - DEPARTMENT OF MATHEMATICS - Temporary Postdoctoral Positions - Several temporary positions beginning in Fall 1996 are anticipated for new and recent Ph.D.'s of any age, in any area of pure or applied mathematics. 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 appointments may be made for up to three years. Mathematicians whose research interests are close to those of regular department members will be given some preference. Applicants should send a résumé and reprints, preprints, and/or dissertation abstract, and ask three people to send letters of recommendation to: **The Vice Chair for Faculty Affairs, Department of Mathematics, University of California at Berkeley, Berkeley, CA 94720.** We request that applicants use the AMS standardized application form and indicate their subject area using the AMS subject classification numbers. The form is the *Academic Employment in Mathematics, Application Cover Sheet*, it is available courtesy of the American Mathematical Society. We should receive this material no later than December 1, 1995. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA, LOS ANGELES - DEPARTMENT OF MATHEMATICS - Regular Positions in Pure and Applied Mathematics - The UCLA Department of Mathematics invites applications for three or more tenure track positions in pure or applied mathematics. Exceptional promise in research and teaching is required. Positions are initially budgeted at the assistant professor level, but sufficiently outstanding candidates will be considered at higher levels. Specific search areas are: algebra, algebraic geometry, number theory and combinatorics; mathematical developments arising from physics; geometry, topology and dynamical systems; analysis probability, and partial differential equations; logic; and computational and applied mathematics. Teaching load is an average of 4.5 quarter courses per year. Positions subject to availability of resources and administrative approval. To apply, send electronic mail to: search@math.ucla.edu, open "<http://www.math.ucla.edu>" on the World Wide Web, or write to: **John Garnett, Chair, Department of Mathematics, University of California, Los Angeles, CA 90095-1555, Attention: Staff Search.** UCLA is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA, LOS ANGELES - DEPARTMENT OF MATHEMATICS - Temporary Positions - Subject to availability of resources and administrative approval: (1) **Three E.R. Hedrick Assistant Professorships.** Applicants must show very strong promise in research and teaching. Salary \$41,600. Three year appointment. Teaching load: four quarter courses per year, which may include one advance course in the candidate's field. Preference will be given to applications completed by January 12, 1996. (2) **One or two Research Assistant Professorships in Computational and Applied Mathematics.** Applicants must show very strong promise in research and teaching. Salary \$41,600. One year appointment, probably renewable up to two times. Teaching load: at most four quarter courses per year, which may include one advanced course in the candidate's field. Preference will be given to applications completed by January 12, 1996. (3) **Two or more Adjunct Assistant Professorship or Lectureship in the Program in Computing (PIC).** Applicants for the **Adjunct position** must show very strong promise in teaching and research in an area related to computing. Teaching load: four quarter programming courses and a more advance quarter courses per year. One year appointment, probably renewable once. Salary range \$44,500 - \$48,200. Applicants for the **Lectureship** must show very strong promise in the teaching of programming. An M.S. in Computer Science or equivalent degree is preferred. Teaching load: six quarter programming courses per year. One-year appointment, probably renewable one or more times, depending on the needs of the program. Salary is \$37,488 or more, depending on experience. Preference will be given to applications completed by February 1, 1996. (4) **An Adjunct Assistant Professorship.** One year appointment, probably renewable once. Strong research and teaching background required. Salary \$38,700 - \$40,600. Teaching load five quarter courses per year. (5) **Possibly one or more positions for visitors.** To apply, send electronic mail to: search@math.ucla.edu, open "<http://www.math.ucla.edu>" on the World Wide Web, or write to: **John B. Garnett, Chair, Department of Mathematics, University of California, Los Angeles, CA 90095-1555, Attention: Staff Search.** UCLA is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF GEORGIA - DEPARTMENT OF MATHEMATICS - Applications are invited for a tenure-track position, starting in Fall 1996, at the rank of assistant professor with research interests in applied differential equations (ODE/PDE). The principal qualification is excellence in teaching and research. Women and minorities are especially encouraged to apply. Salary will be commensurate with ability and experience. To apply send vita and four letters of recommendation to: **John G. Hollingsworth, Head, Department of Mathematics, The University of Georgia, Athens, GA 30602.** The deadline for applications is January 1, 1996. The University of Georgia is an Equal Opportunity/Affirmative Action employer.

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL - DEPARTMENT OF MATHEMATICS - Applications are invited for one faculty appointment in applied mathematics effective Fall 1996. Candidates with research in computational partial differential equations and related areas are especially encouraged to apply. Rank and salary depend on qualifications and budget considerations. Ph.D. in mathematics and exceptionally strong research record and commitment to excellent teaching required. At least 3 years experience beyond the Ph.D. preferred. Send curriculum vitae, abstract of current research program, and four letters of recommendation to: **Search Committee Chairman, Mathematics Department, CB #3250 Phillips Hall, University of North Carolina at Chapel Hill, Chapel Hill, NC 27599-3250.** EO/AA Employer. Women and minorities are encouraged to identify themselves voluntarily. Completed applications received by November 1, 1995 are assured of full consideration. We also request that you send us a completed *AMS Application Cover Sheet* (Fall issues of the AMS Notices).

UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES - DEPARTMENT OF MATHEMATICS - The Department of Mathematics anticipates several visiting, postdoctoral, and possible tenure-track positions. Applicants must show strong research promise and possess excellent communications skills for teaching undergraduate mathematics courses. To apply, please submit the following materials in a single package: letter of application (including your e-mail address and fax number), the AMS Cover Sheet, and a curriculum vitae. Candidates should also arrange for three letters of recommendation to be sent. Mail all materials to: **Chair of Appointments Committee, Department of Mathematics - DRB 155, University of Southern California, Los Angeles, CA 90089-1113.** Review of applications will begin December 1, 1995. Additional information about USC can be found on the Web at <http://www.usc.edu/>

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS - Two anticipated tenure-eligible positions in mathematics or applied mathematics, beginning Fall 1996, probably at the ranks of assistant professor; in exceptional cases, however, more advanced appointments may be considered. Excellence in both teaching and research is essential. For both positions, a Ph.D. in hand or a completed dissertation by September 1996 is required. For one of the positions, experience and strong interest in teaching pre-calculus/quantitative skills is a plus. Please have a vita and three letters of recommendation on teaching and research sent to: **Hiring Committee, Department of Mathematics, Williams College, Williamstown, MA 01267.** Evaluation of applications will begin November 15, 1995 and continue until the position is filled. As an EEO/AA employer, Williams especially welcomes applications from women and minority candidates.

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Position:
Institution/Company:
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Degree(s)	Institution(s)	Year(s)
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AWM's membership year is from October 1, 1995 to September 30, 1996. Please fill-in this information and return it along with your DUES to:

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