AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

PRESIDENT'S REPORT

Stuck in the Himalayas by the monsoon! It sounds kind of romantic, but actually it was very frustrating, boring, and expensive (lost room deposits, airline reservation changes, etc.). And I missed all the AWM/EWM/SIAM sponsored events at the International Congress of Industrial and Applied Mathematics. I heard that they all went very well and were well-attended, but I wish I'd been able to be there. Eventually the weather cleared enough for me to get out, and I did make it to Edinburgh for the last two days, including the minisymposium I organized. A report on the two AWM/EWM/SIAM minisymposia appears on page 16 of this issue.

I *did* participate in AWM's Olga Taussky Todd Celebration of Careers in Mathematics for Women later in July. Thanks to the support of NSA, DOE, MSRI, and ONR, it was a large meeting; we all barely fit into the lecture room at MSRI. Most of the participants were women who are graduate students or who had received their Ph.D.'s relatively recently, and they were all enthused to meet each other and the older mathematicians who were there as mentors. There were two panel discussions with active audience particiation, three poster sessions, and eleven 45-minute talks, most combining a description of the speaker's career path with an exposition of some mathematics. I was particularly struck by Margaret Wright's comment that we all have many careers: for herself, she listed mathematician, problem solver for Lucent Technologies, member of the mathematical sciences community (in particular, participant in scientific societies and their committees), role model (recruiting, mentoring, and encouraging women and minorities), and finally "real person." Many of us would substitute "teacher" for "problem solver," but otherwise it fits. I was also struck by Cathleen Morawetz's statement that in 1968 she attempted to interview all well-known women mathematicians as part of her work for the AMS Committee on Women, and only one, a statistician as I recall, had a regular job. In particular, Olga Taussky Todd did not have a regular faculty position at Cal Tech, and it rankled. (Cathleen herself spent many years supported on "soft money" — research grants — until she was offered a position as an

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AWM

ASSOCIATION FOR WOMEN IN MATHEMATICS

The Association was founded in 1971 at the Joint Meetings in Atlantic City. 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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assistant professor.) But as interesting as many of the lectures and panel discussions were, it seemed to me that the heart of the meeting was all the conversations going on all the time among the participants.

One question asked by an audience member during a panel was "why should one try to get grants?" One of the many answers that came up was the possibility of getting released time from teaching. Although it is difficult or impossible to get such released time on a standard NSF research grant, it is possible on other types of grants; furthermore, it came out that some colleges and universities made a practice (official or not) of giving released time to their faculty who received grants. Later, a participant wanted to know where this was done, so she could use the information in negotiating with her own institution. If your institution does so, please let me know so that I can have it available for those who ask.

A complete report on the meeting will appear in the next issue of this *Newsletter*.

I've been getting a moderate amount of feedback on some of the issues I've raised in previous President's Reports. The "Girls and Math Competitions" online discussion had, as of late July, about a dozen comments listed. I guess I'd summarize them by (1) competitions have very little to do with doing mathematics, (2) often there is some trick to figuring out a problem, and practicing for the competitions helps one learn the standard tricks and how to find some others, (3) whether girls enjoy these practice sessions, and the competitions themselves, seems to vary widely. I'm not sure there's a large enough sample space to be able to make recommendations on how to make the competition scene more girl-friendly, so I encourage readers to continue to send in their experiences. The discussion can be entered from the AWM home page, which is www.awm-math.org (this reminds me to encourage you to add a link to the AWM page on your homepage).

I'm also getting some feedback on the issue of what AWM might do with regard to girls and mathematics, beyond its current program of the Sonia Kovalevsky High School Mathematics Days. Not only have I received half a dozen long letters from individuals, but a group of us discussed this over dinner on Saturday night at the Olga Taussky Todd meeting. Again, please continue to send me your ideas and examples of the things you have done.
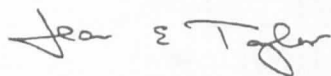
I'd thought of having "AWM, Girls, and Mathematics" as the topic of the AWM Panel at the Joint Mathematics Meetings this coming January, but I decided this large millenial meeting, with SIAM participation, was too good an opportunity to miss for using the topic "How to increase the number of tenured women in mathematics departments." I'm really looking forward to this panel; participants will include provosts and deans of science from institutions which have made successful efforts to increase their number of female mathematicians. If you are in an academic institution, make sure your department chair comes to this AWM panel. If you are a chair and you have been making efforts to increase the number of women in your department (successfully or

unsuccessfully), write to me (taylor@math.rutgers.edu) and tell me what's worked and not worked for you. I'll try, as moderator of the panel, to get this information into the discussion or to call on you as a member of the audience. And I'll see that it gets into the write-up of the panel, anonymously or not at your discretion.
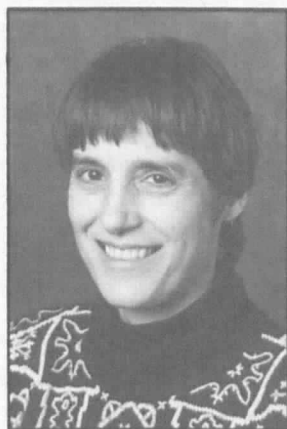
There are a number of deadlines coming up for applying for AWM programs: September 1 (if you receive this issue in time) for the AWM Workshop at the Joint Mathematics Meetings in January and October 1 for the Travel Grants program. Also, October 1 is the deadline for nominations for the Louise Hay Award for contributions to mathematics education by a woman and for the Alice T. Schafer Prize for undergraduate women in mathematics. Details are elsewhere in this issue and at www.awm-math.org.

Watch your mailbox for the AWM membership renewal form which should arrive in September or October. And remember the Challenge Grant is still going on for new members, though it's not worth quite as much as it was in March.

The end of the summer, the start of a new academic year, the start of a long-awaited sabbatical: September is often a time of new faces, new beginnings. I wish you well in all your endeavors.

Jean E. Taylor
Princeton, NJ
July 20, 1999

AMS ELECTION

All persons standing for election for contested office in the American Mathematical Society (AMS) nominated by the AMS Council have been asked to submit statements. The letter sent to them read in part:

You may choose to address any of the topics listed below:

1) the underrepresentation of women and minorities in our field (what can be done to encourage their participation? what can the AMS do? what societal changes are necessary?) or

2) the role of the AMS and the role of your office in the AMS.

Statements were limited in length to a maximum of one newsletter page.

The Council nominated Hyman Bass and Daniel W. Stroock for President, one to be elected for a term of three years. The Council nominated David Eisenbud and Thomas G. Kurtz for Vice-President, one to be elected for a term of three years. The Council nominated Eric M. Friedlander and Donald E. McClure 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: Patricia F. Bauman, William Fulton, Susan C. Geller, Martin Golubitsky, Ellen B. Kirkman, Jonathan M. Rosenberg, Claude Schochet, Ronald J. Stern, Lisa M. Traynor, and William Yslas Velez. Five will be elected to serve terms of three years. Unless otherwise stated, the respondents are professors in departments of mathematics.

All statements received by press time appear below; late arrivals will appear in the next issue. See the AMS *Notices* for biographical data and additional information.

PRESIDENT

Daniel W. Stroock, Massachusetts Institute of Technology

I believe that mathematics is in grave danger of joining Latin and Greek on the heap of subjects which were once deemed essential but are now, at least in America, regarded as relics of an obsolete intellectual tradition. Evidence for my belief comes from several sources, of which I will discuss only three here.

The first, and perhaps the most disturbing, is the present attitude that most American college students have toward our discipline. Even mathematically talented students who are headed into either science or engineering tend to think of rigorous mathematics as a particularly onerous, arcane exercise whose former importance disappeared with the advent of the computer. To wit, just look at the monotonically decreasing enrollments in upper division mathematics courses.

Paulo Russo, AWM Member-at-Large, Trinity College

A second source of evidence is provided by the NSF, which appears increasingly interested in supporting mathematicians only in so far as they are engaged in research other than mathematics. Indeed, the message from the NSF is disturbingly ambiguous. On the one hand, the NSF is still encouraging students to seek degrees in mathematics. On the other, the NSF is using its financial clout to coerce trained mathematicians into areas in which mathematics plays only a minor role.

Finally, there is the suspicion, bordering on contempt, which our popular culture has for mathematics and the people who do it. Not one major American newspaper deigned to mention the Berlin meeting of the IMU last summer, this in spite of the facts that August is a notoriously slow news month and that one recipient of the Fields Medal was an American. At the same time, in Hollywood, Will Hunting is portrayed as a mathematical genius, but he is portrayed as a hero only because he abandons his mathematics and follows his girlfriend into the westering sun.

Given the grim picture painted above, I think that the primary goal of the next AMS president must be to improve the image of mathematics in America. If the American mathematics community fails to convince its fellow citizens that society cannot afford to discard mathematics the way it did Latin and Greek, then I do not see any future for an organization like the AMS. On the other hand, if we can make Americans understand that mathematics plays a more important role in their lives today than it ever did in the past and that the future of an over-crowded world depends at least as heavily on progress in mathematics as it does on anything NASA or SLAC is doing, then I believe that the present dismal situation will be replaced by a period in which mathematics departments will expand and mathematicians will be in great demand. The only rational explanation for the existing attitude of American society toward our discipline is that *we* have done a lousy job getting out word of our accomplishments. Thus, it seems to me that our fate is in our own hands and that the AMS would be delinquent if it did not accept the challenge of determining that fate.

Fortunately, recent AMS presidents have taken up this challenge and have addressed it admirably. Indeed, Cathleen Morawetz, with the help of Arthur Jaffe, forced Rochester's president Jackson to reverse a decision which could have had far-reaching and absolutely devastating repercussions across the nation. In large part, the Rochester victory was won by getting scientists from outside mathematics to express doubt about the possibility of pursuing their own research in an environment from which research mathematicians had been removed. When

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. For foreign travel, U.S. air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

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.

Target dates. There are three award periods per year. 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. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The next deadline for receipt of applications is **October 1, 1999**. Subsequent deadlines are **February 1, May 1, and October 1, 2000**.

Jaffe succeeded Morawetz, he built on this collaborative effort and made the AMS a charter member of a coalition of scientific research societies which lobby Congress. Felix Browder has continued Jaffe's efforts.

Unfortunately, few among the general membership of the AMS have become actively involved. Since the problem is, in essence, political, its solution must also be political. Addressing this political problem will require two steps, the first of which has been taken already by the Board of Mathematical Sciences. Namely, the BMS is overseeing a "decadel study," a project which should generate a large body of material that can be used as supporting evidence for the importance and vitality of mathematics. In fact, one of the goals is to produce a library of vignettes explaining, in non-technical language, what we mathematicians are doing and why the country should be grateful that we are doing it. As president of the AMS, I would try to mobilize the membership to disseminate this information. For example, I would like to have the AMS take responsibility for seeing that every college dean and every Congressional representative have a visit from local mathematicians, who, armed with some of these vignettes, would try to make a case for our discipline. Such an effort would require participation by a much larger cross-section of the AMS than has been involved heretofore. No doubt, it would be a burden. However, if mathematicians are not willing to get into this fray to save their own profession, whom can we expect to do it for us, Will Hunting perchance?

VICE PRESIDENT

David Eisenbud, Director, Mathematical Sciences Research Institute, Berkeley

I am deeply committed to broadening participation in the mathematical sciences. The low representation of women and minorities in top university math departments represents a significant loss for mathematics. As Director of the Mathematical Sciences Research Institute in Berkeley, I am in a position to address this problem in many small but concrete ways. These include:

1. Encouraging scientific programs to include women and minorities in their organizing committees;

2. Hosting conferences that feature women and minorities such as the "Olga Taussky Todd Celebration of Careers in Mathematics for Women" (August 99), or the "2nd conference on Minorities and applied mathematics — connections to industry and laboratories" (September 98);

3. Making sure MSRI's Human Resources Advisory Committee, a group composed of distinguished minority mathematicians and mentors, is involved in key institute functions;

4. Fostering a joint project involving MSRI, the AMS, and several other organizations, to create a database of minority mathematicians and their research interests, so that they can be more effectively recruited into research projects at institutions such as MSRI; and

CALL FOR NOMINATIONS: 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 awarded annually to a woman at the Joint Prize Session at the Joint Mathematics Meetings every January. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense.

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 nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee's work. Five complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. The deadline for receipt of the nomination is **October 1, 1999**. If you have questions, phone 301-405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

5. Raising money, as in the case of MSRI's recent grant from the Sloan Foundation for a successful program to increase the participation of minorities and women in our Summer Graduate Workshops.

Scientific programs and conferences benefit significantly — in scientific terms and in human terms — when they are organized to take advantage of diversity. Measures that enhance the participation and experience of underrepresented groups, such as good introductory workshops and effective mentoring of postdocs, enhance the experience of everyone.

As Vice President of the AMS, I would use the experience I have gained at MSRI to maintain and increase AMS efforts promoting diverse representation in the mathematical sciences.

TRUSTEE

Eric M. Friedlander, Northwestern University

Over the years, the A.M.S. has expanded its role beyond the traditional one of supporting mathematical research through meetings and publications. To mention but three examples: the A.M.S. addresses issues of salary, employment, and diversity which much concern its members; the A.M.S. engages in efforts to encourage funding and public support for the profession; the A.M.S. takes a more active role in issues of mathematical education.

The broad scope of these activities requires the A.M.S. to be sensitive to many factors including the rapid changes occurring in book and journal publications, the public and governmental attitudes toward support for mathematics, and demographic trends. If I were elected a trustee of the A.M.S., I would encourage the diverse activities of the A.M.S. while keeping watch over the financial aspects of the society.

Donald E McClure, Brown University

On the underrepresentation of women and minorities in mathematics:

I shall comment on aspects of underrepresentation in mathematics rather than on the office of Trustee per se, which is addressed separately in the statement I prepared for AMS *Notices*.

Our community faces a dilemma today on the question of encouraging young people, whether members of an underrepresented group or not, to work towards careers in mathematics. When we provide such encouragement, we had better be sure, in good conscience, that the prospects for a rewarding career are bright ones, not clouded by daunting early-career challenges of finding a good career path. During the 1990s, there have been fundamental changes affecting traditional paths followed by young mathematicians and it is not clear today what degree of assurance we can provide a young person considering a career in mathematics. Our professional societies, in particular the AMS, can and do provide leadership in addressing issues affecting the profession, such as (1) conditions of employment, (2) flexibility of career options and (3) assuring that reliable information is available to all parts of the mathematics community.

To be more specific, consider the interesting differential pattern of participation by women in different areas of the mathematical sciences. The

CALL FOR NOMINATIONS: THE 2001 NOETHER LECTURE

The Association for Women in Mathematics established the Emmy Noether Lectures to honor women who have made fundamental and sustained contributions to the mathematical sciences. This one-hour expository lecture is presented at the Joint Mathematics Meetings each January. Emmy Noether was one of the great mathematicians of her time, someone who worked and struggled for what she loved and believed in. Her life and work remain a tremendous inspiration.

The mathematicians who have given the Noether lectures in the past are: Jessie MacWilliams, Olga Taussky Todd, Julia Robinson, Cathleen Morawetz, Mary Ellen Rudin, Jane Cronin Scanlon, Yvonne Choquet-Bruhat, Joan Birman, Karen Uhlenbeck, Mary Wheeler, Bhama Srinivasan, Alexandra Bellow, Nancy Kopell, Linda Keen, Lesley Sibner, Ol'ga Ladyzhenskaya, Judith Sally, Olga Oleinik, Linda Rothschild, Dusa McDuff, and Krystyna Kuperberg.

The letter of nomination should include a one page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. *Five* copies of nominations should be sent by **October 15, 1999** to: The Noether Lecture 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.

1998 Annual Survey of the Mathematical Sciences (*Notices*, Vol. 46, No. 2) reports that among mathematical sciences doctorates awarded to U.S. citizens in 1997-1998, 28% were awarded to women, sustaining an encouraging trend of the past ten years. However, closer examination of the data in the report shows that among doctoral recipients in mathematics, the proportion of women was only 22% (195 women out of 873 total recipients) while among doctoral recipients from statistics departments the proportion of women was 34% (73 women out of 213 total recipients). Wouldn't it be interesting to understand the cause of this difference? Recognizing that any hypothesis is pure speculation — it could be that statistics departments generate a greater response to their attempts to recruit women because it is easier for the young applicant to a graduate program to see a broader variety of career options with a degree in statistics than with a degree in mathematics. (The Society does and should continue to support programs and provide valuable information about the variety of

rewarding directions to which graduate education in mathematics leads.)

During the 1990s, the composition of faculties in mathematics also experienced changes that indicate the greater difficulty for a young person in launching a career in the academic sector, the most important component of the employment market for Ph.D. mathematicians. From 1990 to 1996, the total number of non-tenured tenure-track positions in mathematics declined by 30% overall, from about 4,700 to about 3,300. The numbers decreased by 27% in Ph.D. granting departments and by 31% in Masters and Bachelors granting departments combined. At the same time, we have seen accounts of substandard compensation and working conditions for some non-tenure-track positions at some institutions. These developments are counter to the objective of promising rewarding career opportunities to individuals considering careers in mathematics. The AMS works aggressively to assure that institutions maintain supportive employment practices and sustain the pivotal role of mathematics teaching and

NSF-AWM MENTORING TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Mentoring Travel Grants program supported by the National Science Foundation is to help junior women to develop a long term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award as many as six grants, in amounts of up to $4000 each. Each grant would fund travel, subsistence, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Any unexpended funds could be used for further travel to work with the same individual during the following year. (Applicants for mentoring travel grants may in exceptional cases receive up to three such grants throughout their careers, possibly in successive years; each such grant would require a new proposal and would go through the usual competition.) For foreign travel, U.S. air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Applicants must be women holding a doctorate or equivalent experience and with a work address in the USA (or home address if unemployed). The applicant's research may be in any field which is funded by the Division of Mathematical Sciences of the National Science Foundation.

Each applicant should submit **five** copies of each of the following: a cover letter; a curriculum vita; a research proposal, approximately five pages in length, which specifies why the proposed travel would be particularly beneficial; a supporting letter from the proposed mentor (who must promise to be available at the time of the proposed travel and may be either a man or a woman), together with the curriculum vita of the proposed mentor; an approximate budget; and information about other sources of funding available to the applicant. Send these materials to: **Mentoring** Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer and Space Sciences Building, University of Maryland, College Park, MD 20742-2461.

A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

If you have questions, phone 301-405-7892 or email awm@math.umd.edu. Applications via email or fax will not be accepted. The deadline for receipt of applications is **February 1, 2000**.

research in colleges and universities. It is important for the future of the profession to continue this role of the Society.

MEMBER-AT-LARGE

Patricia Bauman, Purdue University

The AMS plays a central role in promoting excellence in mathematical research and education. It is also central to the process of dialogue and representation of views on current issues in the mathematical community. In an era of increasing emphasis on industry and product-related research, we must act to preserve the excellence of traditional fundamental research and provide leadership for research in new interdisciplinary areas in mathematics. We must promote the development of young mathematicians and take an active role in facilitating their employment in good academic and nonacademic positions. We must encourage the participation of highly qualified women and minorities in mathematics, and we must promote the understanding and appreciation of the role of mathematics in our society.

To accomplish better participation and representation of women and minorities in mathematics, I believe that it is essential for individuals and institutions to work actively to encourage and support their accomplishments and opportunities, from those at the entry level to the highest levels of leadership and decision-making.

As a female mathematician whose research is in the intersection of pure and applied mathematics, I would appreciate the opportunity to serve the AMS in facing these challenges.

William Fulton, University of Michigan

I have been pleased to see the increased and increasing numbers of women in mathematics in general, and in my own field of algebraic geometry in particular. There is surely no better way to encourage young women to enter mathematics than to have them see women in action who are successful.

The AMS should continue to support the participation of women in all areas of our profession. I do worry that some actions of the Council, although well meant, have done more harm than good to this cause. If the general perception is that a prize, or an invitation to speak, is awarded because of gender

rather than quality, this harms both the recipient and women mathematicians in general.

A few years ago I overheard the following conversation:

A: "We should consider hiring X. She has done some excellent work, and she won the Y prize."

B: "But Y is an AMS prize — it doesn't mean anything for a woman to win that."

A: "That's true, but she really is a fine mathematician."

I hope that the AMS can promote a steadily increasing role for women in mathematics, and at the same time work toward a situation so that fewer people will respond like B.

Sue Geller, Professor of Mathematics and Professor of Veterinary Anatomy and Public Health, Texas A&M University

The AMS traditionally supports the health of the mathematics profession in the areas of research, teaching, and service. In all these areas we need to break out of insular mode and welcome a diversity of people, places, and organizations. In particular we need to be more welcoming of people of color, people with non-traditional backgrounds or ages, and women, setting our events and services so as to be inclusive and so as to make possible the participation of everyone, not just those in the traditional group.

The research mission is the primary focus of the AMS. We need to continue to explore all avenues of encouraging mathematics research and funding. We need to open the opportunities for research to a wider diversity of people including minorities, females, and those working at traditionally non-research institutions or in industry by valuing their contributions and making a place for them to be active within the AMS.

The teaching mission of the AMS has existed for decades but has rarely been articulated as clearly as the research mission. Yet we are most visible to the public in the area of mathematics education, and we need not only do a good job but also be perceived as doing a good job. Thus, we need to educate the legislators and the public about the usefulness and necessity of mathematics in order to help obtain more funding for mathematics at all levels. We also need to advertise the universality of mathematics both in its uses and in who can do mathematics

well. With such advertising backed by teaching in ways that include everyone, we open the door to all sorts of people to become the mathematicians of the next generation.

A key component of the service mission is working with other organizations in mathematics and in the mathematical sciences. It is long past time for the various mathematical sciences organizations to work together for the common good. When organizations work in isolation, or worse, at cross-purposes, the public and legislatures are loathe to take their explanations and needs seriously. The AMS should take the lead in coordinating with others.

I have had a long history of working towards the diversification of mathematicians in terms of gender, ethnicity, and age, but have been especially visible in terms of gender, most notably by writing and co-producing skits that were performed at the national AMS/MAA meetings under the auspices of the Committee on the Participation of Women of the MAA. I have also served on and as chair of the Joint Committee on Women in the Mathematical Sciences as well as a member of the Executive Committee of AWM. In addition I currently serve as chair of the Committee on Academic Freedom, Responsibility, and Tenure, which is the last court of appeal within Texas A&M University for tenure appeals and dismissal-for-cause cases. Thus I have been and continue to be active in promoting justice and fairness in whatever venue I find myself. I

intend to continue to promote the welfare of all mathematicians without regard to race, color, sex, place of employment, or major job functions. Only by working together can we hope to improve the working conditions and status of mathematicians.

Martin Golubitsky, University of Houston

The AMS is a large professional organization with many roles. The AMS fosters mathematical research (book and journal series, regional and national meetings, research tools, and prizes), the communication of mathematics (*Notices*, minicourses, government affairs, and mathematics education), and sociological issues of the profession (data on salaries, employment registers, minority participation, and human rights) to name a few. The scope of the AMS can be judged by the fact that there are more than one hundred AMS committees.

The role of the AMS Council is to "formulate and administer the scientific policies of the Society" and to "act in an advisory capacity to the Board of Trustees"; the Council can also speak in the name of the Society in governmental and education matters. With these facts in mind, Council Members must approach their position with an open mind, while focusing on the important issues of the day and carrying out the routine tasks that require Council action.

The continued health of the mathematics profession depends in part on the discovery of exciting

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CALL FOR NOMINATIONS: ALICE T. SCHAFER MATHEMATICS PRIZE

The Executive Committee of the Association for Women in Mathematics calls for nominations for the Alice T. Schafer Mathematics Prize to be awarded to an undergraduate woman for excellence in mathematics. All members of the mathematical community are invited to submit nominations for the Prize. The nominee may be at any level in her undergraduate career. She must either be a U.S. citizen or have a school address in the U.S.

The Schafer Prize was established in 1990 by the Executive Committee of the AWM and is named for AWM former president and founding member, Alice T. Schafer, who has contributed a great deal to women in mathematics throughout her career. The tenth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in Washington, D.C. January 19–22, 2000.

The letter of nomination should include, but not be limited to, an evaluation of the nominee on the following criteria: quality of performance in mathematics courses and special programs, demonstration of real interest in mathematics, ability for independent work in mathematics, and performance in mathematical competitions at the local or national level, if any.

With letter of nomination, please include a copy of transcripts and indicate undergraduate level. Any additional supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, recommendations letters from professors, colleagues, etc.) should be enclosed with the nomination. Send *five* complete copies of nominations for this award to: The Alice T. Schafer Award Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. Nominations must be received by **October 1, 1999.** If you have questions, phone 301-405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

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new mathematics and in part on how our profession is perceived by nonmathematicians (especially those in government). Our community can do a better job of communicating what is exciting about mathematics and the AMS can help in this task. For example, the AMS could establish a speaker's bureau for public lectures about mathematics and provide an archive of articles on the successes of mathematics on the e-math web site. As a Council Member I would participate actively in the everyday affairs of the Council including the oversight of the many AMS functions and I would explore new ways for AMS to help communicate mathematics to nonmathematicians.

Ellen Kirkman, Wake Forest University

The AMS has the role of promoting mathematical research; it also provides a forum for discussion of issues of concern to mathematicians. The Council of the AMS plays a major role in determining AMS policy.

An issue of major concern to mathematicians is the job market, and helping the current generation of mathematicians find appropriate jobs. The mathematical community needs to continue to discuss how best to prepare mathematicians for existing jobs; we need to inform students about opportunities in government and business. We also need to continue efforts to expand the job market; we must do all we can to curb the trend toward hiring adjuncts to teach mathematics in colleges and universities. Furthermore, we must work to attract more good students into mathematics.

The AMS should continue to address the decrease in support for research. Multi-disciplinary research is important, but we must also support core mathematics. We need to make the case for the importance of mathematical research not only to policy-makers in Washington, who provide external support for mathematics, but also to the academic administrators, who make decisions that affect the creation of jobs and the provision of internal resources for research. The AMS also needs to continue to educate the public about the importance of mathematics and mathematical research.

Addressing the underrepresentation of women and minorities in mathematics should remain a priority of the AMS. Working to diversify our community is not only the right thing to do, it is also in our own best interest, for a more diverse mathematical community will broaden the support for mathematics. Societal attitudes certainly contribute to the problems of women and minorities in mathematics, and recent studies such as that at MIT indicate that these problems exist also in the other sciences, and even at some of our best institutions. The AWM, NAM, and many individuals have developed excellent programs for helping women and minorities succeed in mathematics; these efforts need to be supported and publicized. I have worked with other women scientists at my own institution to provide opportunities to help women pursue careers in science and mathematics; this summer I helped in the EDGE program in mathematics, and I have seen the good ideas and hard work of others bring change.

The mathematical community has many good ideas for making progress in each of these complex problem areas, and the AMS has the ability to organize our efforts to work together in addressing these problems. I believe that I could help in these efforts.

Jonathan M. Rosenberg, University of Maryland

The AMS is the world's largest and strongest organization for promoting mathematical research, as well as one of the world's premier mathematical publishers. We must make sure it continues to be successful in the promotion and dissemination of research, but to do so, we must adapt to changing times. While mathematics plays an increasingly important role in all aspects of society, public appreciation for research mathematics as an enterprise, as well as general understanding of the mathematical profession, is remarkably low. Turning this situation around is a very difficult challenge for the AMS. If elected to the Council I would work for modernization of mathematics education (to convince the general public that mathematics is a living subject), better recruitment and support of talented young people (of both genders and all ethnicities) in mathematics, and improved public relations. The AMS has begun to work on all of these fronts, but much additional work is needed.

Lisa Traynor, Bryn Mawr College

I believe that a key step to improving the underrepresentation of women and minorities in mathematics is a better public awareness of mathematics. I'm sure we are all familiar with the shocked, blank stares that we receive after telling others that we are mathematicians. People who don't immediately change the subject often ask me one of two things.

Parents are usually curious about what type of jobs that a math major can get. Another common response is to begin talking about Einstein or a recent show they saw about physics on public television. Mathematics is such an incredibly versatile profession. We are doing mathematics and young people a disservice by not explaining in common language the usefulness and exciting discoveries of contemporary mathematics. In recent years there has been some progress towards better public relations. I am a fan of the series "What's Happening in the Mathematical Sciences" published by the AMS. Keith Devlin's recent interviews with Scott Simon on National Public Radio and the PBS series "Life by the Numbers" have been wonderful starts in this direction. These sorts of efforts need to be expanded. For example, the mathematics community can improve its public image by making material and pictures for newspaper articles readily accessible and by providing more pictures of contemporary mathematicians, including women and minorities. In addition to encouraging young people to consider a career in mathematics, better public awareness will improve funding from the government and private sectors.

Getting people excited about mathematics is a first step. Mentoring activities can help women and minorities find a supportive community that will encourage them to participate in and contribute to mathematics. I am always amazed when I read autobiographies of mathematicians and it is described how comfortable the person is when he reaches the graduate school environment. Women and minorities often become very isolated at graduate school. Too many know what it is like to be the only woman or minority at a conference. At all levels, I see brilliant women and minorities suffering from a lack of self-confidence and as a consequence not receiving sufficient credit for their work or their intelligence. A number of wonderful mentoring programs are in existence. For example, I have been a participant in one of the AWM's workshops for graduate students and postdocs and I have been involved as both a participant and organizer of the IAS/PCMI Women's program. I have seen the healthy effects of networking and sharing of common experiences. I believe that these sorts of programs must be encouraged and expanded beyond the postdoc level to increase the retention of women and minorities.

CONCRETE CEILING

Women-of-color managers and professionals describe barriers to their advancement as a "concrete ceiling," according to a major Catalyst study. *Women of Color in Corporate Management: Opportunities and Barriers* finds that 47 percent of over 1,700 women-of-color survey respondents from 30 leading U.S. companies cite as barriers the difficulty of not having an influential mentor or sponsor; 40 percent cite the lack of informal networking with influential colleagues; 29 percent note the lack of company role models who are members of their racial/ethnic group; and 28 percent speak of the lack of high visibility assignments.

"The metaphor of a 'concrete ceiling' stands in sharp contrast to that of the 'glass ceiling.' Not only is the 'concrete ceiling' reported to be more difficult to penetrate, women of color say they cannot see through it to glimpse the corner office," says Catalyst President Sheila Wellington.

Women of Color is the culmination of a three-year study of African-American, Asian-American, and Hispanic women managers in professional and managerial positions in the U.S. In addition to the survey responses, the research is based on 59 focus groups of 302 women, 82 individual interviews, and a review of diversity policies at 15 major companies. The study looks at women of color's expectations, experiences, and perceptions of corporate culture and how they affect the women's job satisfaction, organizational commitment, and intent to stay with the company. It also details Catalyst recommendations to companies for increasing the effectiveness of diversity for women of color and presents best practices among the corporate leaders.

The examination of corporate diversity programs reveals that diversity initiatives are not as effective as they could be or were intended to be for women of color. Seventy-five percent of the women of color surveyed are aware of training in their corporation to address race and gender issues, but only 22 percent say their managers receive adequate training in managing a diverse workforce. More than half (53 percent) of the women feel their companies' diversity programs are ineffective in dealing

with issues of subtle racism, 26 percent of the women say that career development is an important part of their companies' diversity programs, and only 17 percent believe their managers are held accountable for advancing women of their racial/ethnic group. And in evaluating their work environments, many women, particularly African-American women, cite pervasive stereotypes.

The study reports that effective diversity programs foster retention. Survey responses indicate that diversity initiatives can increase women of color's intent to stay with their current company.

As the number of women of color in the workforce rapidly increases and the competitive advantage from diverse perspectives is further recognized, American businesses will clearly need to review their diversity programs. "People assume that all women and people of color benefit from diversity initiatives," said Katherine Giscombe, Ph.D., Catalyst's project director for Women of Color, "But this simply is not true. In fact, many women in our study feel that they are overlooked in these programs. In order to make change for women of color, companies must zero in on these women and tailor programs to fit their particular needs. In this case, one size does not fit all."

IBM Best Practice: In 1995, IBM's Women's Task Force suggested that the company focus more closely on women of color. An internal study, prompted by a subcommittee of executive women of color, identified the need to provide developmental programs as well as role models and mentoring opportunities for women of color. As a result, the number of women-of-color executives in the U.S. rose from 1.4% (17 of 1,261) in 1995 to 2.3% (42 of 1,802) in 1998. Motorola Best Practice: Six years after broadening its succession planning practice to accelerate the advancement of women to the vice-president level, the company realized that few of the women who had advanced were women of color. Since 1995, Motorola makes sure that each mechanism supporting its succession planning process specifically targets women of color. Consequently, there are now eleven women-of-color vice presidents, out of a total of 54 women vice presidents, up from only one in 1991. Xerox Best Practice: Initiated in 1986, Xerox's Black Women's Leadership Council serves to address issues unique to African-American women and to advance their professional development. This program, in conjunction with the Balanced Work Force Strategy — in place to clarify the percentage representation of women and men by racial group within each grade level and organization — has added to the overall impact of women of color at Xerox. Among senior managers, representation of women of color rose from 3.5% in 1995 to 4.9% in 1999.

Women of Color in Corporate Management: Opportunities and Barriers was sponsored by The Ford Foundation with matching funds from eighteen companies.

1999 CHAIRS COLLOQUIUM

On November 12–13 at the National Academy of Sciences in Washington, DC, the Board on Mathematical Sciences of the National Research Council will hold its 1999 colloquium for chairs of college and university mathematics and statistics departments. As in past years, this meeting provides an opportunity for department chairs to share experiences and ideas for addressing stresses that affect many departments. A special attempt is being made this year to appeal to chairs from smaller schools.

As has been the case for several years, the first half-day of the meeting is designed for chairs who are relatively new to their positions, and the remainder of the meeting includes a mix of plenary and break-out sessions aimed at a range of topics, such as: the chair's role in individual faculty development, the MIT study on the status of women faculty members, issues for small colleges, appropriate level of computing technology and training for statistics students, recent thinking on developmental math courses, means of developing collaboration and cooperation within institutions, mathematics education and educating mathematicians, and distance learning challenges and opportunities.

A half day of the colloquium will explore the diverse forms of distance education and the issues that distance education presents for academic departments in the mathematical sciences. Chairpersons who attend will also have an opportunity to learn about federal funding initiatives and any policy changes that affect their departments.

The agenda of the colloquium is available online at www.nas.edu/bms. The registration fee for the colloquium is $175. For further information, contact the Board on Mathematical Sciences at 202-334-2421 or bms@nas.edu.

WHAT I READ ON MY SUMMER VACATION

Judith Hennessee, **Betty Friedan: Her Life**, Random House, New York, 1999. xvii+330pp. ISBN 0-679-43203-5 (cloth), $27.95. Daniel Horowitz, **Betty Friedan and the Making of "The Feminine Mystique": The American Left, the Cold War, and Modern Feminism**, University of Massachusetts Press, Amherst, 1998. viii+355pp. ISBN 1-55849-168-6 (cloth), $29.95.

Reviewed by: Marge Murray, Book Review Editor, Department of Mathematics, Virginia Tech, Blacksburg VA 24061-0123; murray@calvin.math.vt.edu

I am writing this column from the comfort of my air-conditioned office in Virginia, during the hot, sultry midsummer, just days after the United States women's soccer team's victory over China in the Women's World Cup. For the past several weeks, the airwaves have been filled with the exploits of the American soccer players. In particular, newspapers, radio, TV, and the Internet extol this generation of women athletes as the "Title IX generation." Soccer star Mia Hamm is said to be the quintessential member of this generation; at twenty-seven, she is precisely the same age as Title IX, and she grew up as the beneficiary of programs in sports for girls and women which were initiated under its auspices.

What is Title IX? If the reports of the news media are to be believed, Title IX is a piece of legislation from the early 1970s which ensures that women have equal opportunity to engage in sports activities in America's publicly supported high schools, colleges, and universities. In this case, however, the news media reports are *not* to be believed. Title IX of the Educational Amendments Act of 1972 was intended to prohibit sex discrimination in all programs administered by federally funded institutions of higher education. The connection of Title IX with sports has persisted largely because it is in the area of athletics that Title IX has been *least* effective in providing women equal access to programs and facilities.

Title IX was the culmination of over ten years of women's rights activism. In the minds of many, this wave of feminist activism (which began in the 1960s and continued into the 1970s) was inspired by the publication of one unusually influential book: *The Feminine Mystique* by Betty Friedan, first published in 1963. In terms of its revolutionary

impact, Friedan's book has been compared to Rachel Carson's *Silent Spring* (1962), which went a long way toward launching the environmental movement of the sixties and seventies. But, in the view of Judith Hennessee, *The Feminine Mystique* was even more dramatic in its impact: "it was *The Feminine Mystique*," writes Hennessee, "that became the opening salvo in the most far-reaching social revolution of the century" [Hennessee, 79].

In *The Feminine Mystique*, Betty Friedan wrote from the point of view of the white, American, middle-class suburban housewife of the 1950s, brainwashed by the culture into the belief that a woman's greatest fulfillment can be found in caring for home, husband, and children. In compelling, often relentless prose, Friedan demonstrated that women have a right to education, to fulfillment in the wider world — in other words, women must stand up for their rights and claim "an identity of their own." In the words of Judith Hennessee, "Although the book took as its example the suburban housewife (and was severely criticized for that limitation), the attitudes it described were universal" [Hennessee, 81]. Friedan's passionate book was a call to arms for the women's liberation movement of the sixties, and found a wide audience, not only in the United States but in many other Western countries as well.

The two books under review offer distinct, complementary views of *The Feminine Mystique* and its mercurial author, Betty Friedan. The book by Daniel Horowitz is the more scholarly, and in many ways the more intriguing, of the two. Horowitz aims to trace the origins of *The Feminist Mystique* to progressive social movements of the 1930s and 1940s (and even earlier), and to point out the stark contradictions between the early life of Betty Friedan and the suburban housewife persona she adopted in writing the book. Hennessee's book is the more accessible — and gossipy — of the two; if anything, Hennessee is more concerned with what happened to Friedan *after* the publication of *The Feminine Mystique*, as Friedan came to be recognized as a charismatic (and combative) spokeswoman for the women's movement.

Friedan was born in Peoria, Illinois in 1921. Her parents came to the United States as part of the great wave of Jewish emigrants who came to this country in response to antisemitic persecution in

Eastern Europe in the late 19th century. Her father, very much a self-made man, developed a successful jewelry business in Peoria and, in time, her family numbered among the wealthiest in town. While Friedan's childhood was financially secure, she experienced several disappointments which had a far-reaching impact upon her later life. As a young woman, she was not considered particularly attractive and grew up in the shadow of a mother and sister who were much more conventionally pretty than she. Moreover, as a member of the Jewish minority in a predominantly white, Protestant midwestern town, she experienced many antisemitic social slights, the most painful of which was her exclusion from participating in the local high school sorority. What set Betty apart from her peers was her incisive intelligence, her sharp wit, and her skill as a writer and organizer.

In 1938, she turned her back on the provincial world of Peoria and enrolled as a freshman at Smith College. In those days, she asserted, "I want to do something with my life — to have an absorbing interest.... I want success and fame" [Horowitz: 32]. At Smith, she developed an intense fascination with the field of psychology. At the same time, she became deeply involved in both theater and journalism. But, in Horowitz' view, the most important development during Friedan's years at Smith was her increasing involvement in radical politics. Coming from a privileged background, Friedan's increasing interest in pacificism, labor union activism, and rapprochement with the Soviet regime seems somewhat paradoxical. Yet it was in the political arena that her skills as a writer and speaker found their most impassioned expression.

Upon graduation from Smith in 1942, Friedan went on to graduate school in psychology at Berkeley, where she continued her political activism and won a prestigious scholarship that would have fully funded her dissertation research. Yet, after just one year at Berkeley, she dropped out of graduate school, never to return. Hennessee asserts that Friedan left Berkeley in frustration over her inability to find a satisfying balance between personal and professional life. Although she had had many boyfriends and lovers, Friedan believed that increasing intellectual achievement would diminish her chances for marriage. Horowitz, by contrast, believes that Betty left Berkeley because she could not abide the strong disjunction between the cool academic world of psychology and the passionate allure of radical political activism.

Whatever the reason for her departure, Friedan moved from Berkeley to New York City, where she worked for several years as a trade union journalist and where, in 1947, she met and married Carl Friedan. Horowitz is fascinated by her involvement, during the years 1946 to 1952, as a writer for the *UE News*, the official organ of the United Electrical, Radio, and Machine Workers of America. Writing under her maiden name, Betty Goldstein, she participated in political activism on specific issues, including racial equality, access to health care, and the needs of working women. As the Cold War and McCarthyism gathered momentum, her social and professional contacts brought her dangerously close to the Communist party. Indeed, largely because she had not written under the name Betty Friedan, she never became a major target for McCarthyist redbaiting in the 1950s. She left the *UE News* at about the same time as the execution of Julius and Ethel Rosenberg. Horowitz speculates that Friedan was, perhaps, "relieved to quit the world of radical labor journalism [because] it was getting too hot there" [Horowitz, 152].

Horowitz regards *The Feminine Mystique* as the culmination of a lengthy period of metamorphosis, during which Friedan turned her attention from the wider world of labor activism to the private world of marriage and family. In particular, Horowitz argues that Friedan, frustrated by the widespread sexism of progressive movements in the 1940s, at last found an effective way to air the concerns of women. In writing *The Feminine Mystique*, Friedan adopted the persona of the suburban housewife, devoted entirely to home and family, who did not work outside the home. But this was not the reality of Friedan's life in the 1950s. Although she did, indeed, live in the New York suburbs during the 1950s, she worked as a freelance journalist for women's magazines — some of the same magazines she criticized in her book — and as a community organizer in a variety of settings. Much of the book was written in the legendary Allen Room for writers at the New York Public Library, in the company of "important male writers working on important male books" [Hennessee, 74].

Hennessee is far more interested than Horowitz in chronicling what happened to Friedan — the collapse of her marriage, her involvement in the founding and early years of the National Organization for Women — in the aftermath of the book's publication. Hennessee is intensely preoccupied with the personality clashes and

behind-the-scenes struggles that marked the early years of the women's movement. Here, Hennessee — not unlike the popular press of the sixties and seventies — comes dangerously close to describing the leaders of a serious social movement as a group of women involved in a catfight. None of the leading personalities — including Friedan, Ti-Grace Atkinson, Florynce Kennedy, Gloria Steinem, Bella Abzug, Rita Mae Brown, and many others — are portrayed in a particularly sympathetic light. A sense of the power and impact of the women's movement seems to be lost in Hennessee's fascination with Friedan's personal travails and struggle for power.

Taken together, however, these two books provide considerable insight into the historical, social, personal, and political factors that inspired the women's movement of the late twentieth century — and ultimately gave rise to Title IX.

AWM/EWM/SIAM ICIAM99

The International Congress on Industrial and Applied Mathematics (ICIAM99) held in July in Edinburgh, Scotland, provided an excellent opportunity for a one-day high-quality international event with presentations by women researchers. Organized by Professor Joyce R. McLaughlin, the Ford Foundation Professor at Rensselaer Polytechnic Institute, and Dr. Hilary Ockendon, Acting Director of the Center for Industrial and Applied Mathematics at Oxford University, the event, held the second day of the five-day meeting, was quite a success.

Two minisymposia constituted the event. The first, titled "Industrial Research Successes," featured senior researchers who are either employed in industry or work on industrial problems in an academic setting. Some participate in industrial/academic workshops. In addition to the presentation of successfully solved problems and new problems being addressed, the talks gave insight into the industrial problem-solving perspective, described types of solutions which are sought, and described successful problem-solving environments. The talks were lively and attracted room-filling audiences to hear speakers invited from around the world.

The speakers and their titles are: Dr. Rosemary E. Chang, Corporate Research and Development, SGI, USA, "Visualization of models with free-form surfaces"; Dr. Margaret H. Wright, Bell Laboratories, Lucent Technologies, USA, "Better, bigger and beyond"; Dr. Kerry A. Landman, University of Melbourne, Australia, "Mathematics — The invisible achiever"; Dr. Barbera W. van de Fliert, University of Twente, The Netherlands, "Evaporation and stress-driven diffusion: A generalized Stefan problem in paint." It's truly a distinguished list.

The second minisymposium provided an excellent early career opportunity with travel grants for U.S. postdoc speakers provided by grants from the Office of Naval Research and the National Science Foundation. Speakers were chosen competitively, by an international committee of senior women researchers, from applicants who are within ten years of their Ph.D. The applicants on this list were very accomplished and selection was indeed difficult. Those speakers who were selected gave well-thought-out, clear presentations that resulted in admiring comments from the audience. For this

Joyce McLaughlin, RPI

Joyce McLaughlin and Hilary Ockendon

Yanni Zeng, L. G. de Pillis, Andrea Bertozzi, and Corinne Cerf

minisymposium the speakers and their titles are: Professor Andrea L. Bertozzi, Duke University, Durham, USA, "Undercompressive shocks in driven film flow"; Dr. Corinne Cerf, Université Libre de Bruxelles, Belgium "Detecting the chirality of knots and links, with application to chemistry"; Professor L.G. de Pillis, Harvey Mudd College, Claremont, USA, "Modeling cancer tumor growth with an optimal control approach to chemotherapy"; and Professor Yanni Zeng, University of Alabama at Birmingham, USA, "Gas flow in thermal nonequilibrium and hyperbolic systems with relaxation." The reported research successes were quite impressive.

An important part of this event was the joint sponsorship by AWM and the European Women in Mathematics (EWM) and SIAM (The Society for Industrial and applied Mathematics). This joint sponsorship resulted in a high-quality activity including researchers from the United States, Europe and Australia. A goal for the future is to broaden the international participation even further.

Thanks to Deborah Frank Lockhart, NSF, for the photographs!

Rosemary Chang, Margaret Wright, Barbera van de Fliert, and Kerry Landman

ICM–98: WOMEN IN MATHEMATICS

At the International Congress of Mathematicians, Berlin, August 1998, there were several activities scheduled by ICM through a coordinated effort of representatives of the European Women in Mathematics (EWM), the Association for Women in Mathematics (AWM), and other groups representing women mathematicians.

A plenary Emmy Noether Lecture especially appropriate for the occasion was presented by Cathleen Synge Morawetz (Courant Institute, New York University). She was introduced by Irene Gamba (University of Texas at Austin). Morawetz spoke on "Variations on Conservation Laws for the Wave Equation"; see the November–December 1998 *Newsletter* for a report on her fascinating talk.

The 1996 video "Women and Mathematics across Cultures" was shown; it introduces EWM and then presents four women mathematicians who share their personal experiences about the impact of cultural differences on the status of women in the profession. Its making was motivated by questions such as: Why are there many more women mathematicians in Italy and Brazil than in Norway, England or Germany? What is it about Latin culture that encourages women mathematicians, while that of Northern Europe mitigates against them? The film was directed by Marjatta Naatanen (University of Helsinki) with Bodil Granner (Technical University of Denmark), Kari Hag (UNIT-NTH, Trondheim, Norway), and Caroline Series (University of Warwick, UK). [See the January–February 1999 issue of this *Newsletter* for ordering information.]

A Round Table discussion "Events and policies: Effects on women in mathematics" preceded the showing of the EWM video. It was organized by Christine Bessenrodt (University of Madgeburg, Germany), Bettye Anne Case (Florida State University) and Bhama Srinivasan (University of Illinois at Chicago). The discussants were Claire Baribaud (EPFL Lausanne and ETH Zürich), Ljudmila Bordag (University of Magdeburg, Germany), Mary Glazman (University of Mexico), Dusa McDuff (SUNY Stony Brook), Mingping Qian (University of Peking), and Inna Yemelyanova (Nizhny Novgorod State University, Russia). The panelists discussed impacts on the work and lives of women in

the mathematical sciences which may result from various national policies, practices, and events centered on the question: Do some of these events cause more women or fewer to participate in mathematics? From the speakers and the discussion following, there were a number of concerns about numbers of, and the status of, women mathematicians. The mathematician from the former Soviet Union indicated worsened conditions for faculty members in general. In former East Germany there is employment uncertainty on the part of many who have previously held permanent positions, especially if they are not ethnic German, as a result of the reunification and consequent restructuring of the university faculties on the Western Germany model. The Swiss postdoc indicated that since women mathematicians have little opportunity in Switzerland, and Switzerland is not now joining the European Union, the opportunity may be lessened for the academic refuge that a number of Swiss women have found in European universities (e.g., France); Swiss women will now have to compete with mathematicians who can move easily employment-wise among EU countries without work permits. The speaker from China gave evidence of less compliance with existing legal statements regarding equality of hiring opportunity for women. During the discussion period, women mathematicians from the United States raised the concern that attacks on Affirmative Action may lead to policies which will hurt women mathematicians.

Summaries from the five non-U.S. speakers follow.

Claire Baribaud, EPFL Lausanne, Switzerland (Postdoc 1998 Spring) and ETH, Zürich, Switzerland (Postdoc 1998–1999)

In Switzerland there are very few women who have a steady job as a mathematician in a university. Very few "tenure-track" jobs open up at all in universities, and when they do, women are not hired.

Many young women study mathematics, however. Here is a short description of the situation:

* 50% of those who receive a bachelor's degree in mathematics are women. (Most of these women get teaching jobs.)

Reported by Bettye Anne Case (Florida State University) and Bhama Srinivasan (University of Illinois at Chicago)

- 30% of those who receive a master's degree in mathematics are women.

- 10% of the people who complete and defend a Ph.D. thesis in mathematics are women. Most of these women do a Ph.D. thesis in applied mathematics and get a job in a bank or an insurance company. My work is in pure mathematics, Riemann surfaces, and my thesis defense was crowded because a woman doing this was a novelty.

There have been affirmative action regulations in Switzerland for several years. Moreover, some scholarships have been created in order to encourage women to go back to the academic world after a hiatus for having children. However, in Switzerland the social system is not well-developed and it is extremely difficult to both be a mother and work at the same time.

In the past few years, nevertheless, more and more industries, banks and financial institutions, and insurance companies have begun to hire women. There have been comments about the preferability of hiring women rather than men for basically these two reasons: Women will accept lower salaries; women are more compatible in the workplace than men because they like to discuss matters and are productive in a team effort.

I received my Ph.D. about two years ago and have been a postdoc in the U.S. and Switzerland since then, one year with a Swiss postdoctoral fellowship. My research is going OK, but I do not have any prospects for a faculty position in Switzerland.

Ljudmila A. Bordag, University of Madgeburg, Germany

I thank the organizers of this panel for giving me the opportunity to speak about my experiences with German unification. I don't have exact statistics or tables except for one item at the end of this report. I will give you only my personal impressions about the deep changes in education which took place after the German unification, especially at Leipzig University. I have a somewhat unusual career, so I can in some sense compare three systems. I was born in Russia and studied at St. Petersburg University, the former Leningrad State University. During that time I married a citizen of GDR (German Democratic Republic, or the former East Germany).

After my diploma I was able to continue my study as a Ph.D. student at the same University. After obtaining my Ph.D. the question arose as to where to look for a job. At that time it was quite difficult for my husband, who is a physicist, to get work commensurate with his qualifications in Russia. We decided to go to the GDR. We both started working at Leipzig University in 1978. At that time it was the second largest university in GDR. The staff of the Mathematics Institute, the oldest in Germany, consisted of about 120 persons. The Analysis Group was the biggest in the GDR and consisted of 25 persons. At that time there were about 17 women in different positions in the Section of Mathematics (now Fakultät für Mathematik und Informatik). At that time we had about 100 new students each year in our department, including students in all possible mathematical areas and also future school teachers. In comparison with Leningrad University, where there were about 350 students each year (for Master of Science), our university was small and informal. For me it was also the first time in my life that I understood that I am first and foremost a woman and only then a mathematician. In Leningrad there were many more women in professorial positions and the general atmosphere was more friendly to women. At Leipzig University I was in fact not really discriminated against as a woman; however, some time later it became clear to me that I did not have any chance for a career, because I was from Russia. There appeared to be some secret instructions not to give leading positions to citizens from abroad. So I remained in the position that I started with for all those years; a scientific assistant, which was, however, a permanent appointment.

During this time we had two children. We had no problems with our superiors, since having children was considered natural and usual. It was also possible to get places in a kindergarten for the whole day. Childcare was very good, and perhaps this was the best feature of life in the GDR. (Childcare in East Germany exists more or less as before, with some small differences. The birth rate declined rapidly in East Germany after unification. Many kindergartens were closed. Childcare in the remaining kindergartens is much more expensive, but is still possible.)

After the German unification we hoped that we could take part in policy decisions at the University. But the reality turned out to be quite different. Our state, Sachsen (Saxony), was not the richest one and

restrictions and cuts were introduced. This policy was very severe at Leipzig University, more severe than at all other East German universities. Before the unification we had about 9000 employees, including scientists, technical and other staff (excluding medicine, which had 5000 additional employees). At our university there were many clinics, an Egyptian museum, geological and botanical collections and so on. A number of institutes were closed, while others were reorganized. For a period of about two years we had no idea what was involved in our current positions. We had to fill out a large number of forms about our former political activities and possible surveillance by GDR security. For all of us this was a very difficult time. Later we got the typical structure of a university as in Western Germany. In comparison to the structure of a university in Russia or GDR we had only a very small number of permanent positions below the professorial level. To bring the number of staff down a number of laws protecting employees were suspended. We had to apply anew for our positions, many of which were now temporary positions for one to six years. Some of us (about 30 percent at our institute) got such temporary positions, and most of the staff lost their positions completely. In the subsequent years each tenured position which became vacant was cancelled. Now our University has a staff of about 2500 persons (excluding medicine: the medical clinics and institutes now have 4500 employees).

What is the situation for women after the unification?

Now it is easy to know all the women in the scientific staff of the Mathematics Institute. That includes me (only up to April 1, 1999; see the appendix), a second woman who has curried a position as equal-opportunity officer and a third woman who has now regained a permanent position after a long succession of lawsuits. But there are also encouraging events for me after the unification. From October 1, 1997 up to now I have held the Dorothea von Erxleben guest professorship at the University of Magdeburg. This one-year professorship was organized by women of the University of Magdeburg, including especially Professor Christine Bessenrodt who is present here [one of the organizers of the panel]. This professorship is given to women in fields of science where they are under-represented.

I would like to thank all of you for your attention and interest in listening to my talk.

Table: Scientific Personnel at the Mathematics Institute, Leipzig University

	Staff	Women	Percentage
September 1990	110	17	15.5
September 1998	53	2	3.7

Appendix

The following is a summary of my employment since I first wrote this report: I am now in Cottbus, about 150 km to the northeast of Leipzig, where I have a six-month position at the Technical University in an experimental physics group. I do calculations of bindings energies in solid states. It is really not the same as projective geometrical structures of differential equations. But it appears that people like my work. Beginning October 1, 1999 I will have a new appointment (also six months) as Sofia Kovalevskaja Gastprofessor at the University of Kaiserslautern. What I will do after April 1, 2000 is still open. In the Mathematics Institut of Leipzig University there is now only one woman and her position is not a regular one. The other woman there died tragically.

Mary Glazman, University of Mexico

First I would like to thank the Organizing Committee, and especially Bhama Srinivasan, for inviting me to participate in this panel and to share some of my ideas with you. I was asked to speak about *Events and policies: Effects on women in mathematics* and it was suggested that I address the issue of how the economic crisis in Mexico has affected women in mathematics.

In order to set the stage, I would like to begin with some ideas probably shared by many of you, and which will help me put the topic of my talk in context.

In my reading and reflections, I find the same question appearing over and over again. Do women, because they are women, think differently? Feminist and gender researchers seem to be convinced that we do. In [1] we read:

Feminist writers have convincingly argued that there is a masculine bias at the very heart of most academic disciplines, methodologies and theories. Feminists are beginning to articulate the values of the female world and to reshape disciplines to include women's voices, while continuing to press for the rights of women to participate as equals in the male world.

The Educational Testing Service reported in *Physics Today* (June 1997) that after testing around fifteen million students from 4th, 8th and 12th grades in the United States over the course of the

last ten years, they found the average difference in academic achievement to be zero. However, they reported specific differences in the way of learning and on the abilities displayed by boys and girls.

Why should we think there are differences in the way we think? What evidence supports this? Many papers have been written on the subject. Still, the facts are not yet clear. As with any human activity, it is very difficult to provide conclusive facts to support this claim. What I have read, so far, does not completely convince me. However, there are perceptions and sensations that come from my everyday experience which make me think this must be true. I do not know if these perceptions are connected with my cultural background and my personal history. Certainly we are all, to some extent, shaped by our cultural background: the way we speak, the way we learn, the way we behave, the way we struggle with everyday life and the way we envisage and solve problems. For instance there are images, especially connected with films, that I think could only have been conceived of by a woman. In the Mexican film *Danzon* (Maria Novaro), there is a scene where the heroine sees the man she is looking for at the prow of a ship ... no man could create such an image.

If we are shaped by our nature and by our cultural background, what happens with our work in mathematics? The evidence is not so clear as in films, but I cannot deny the possibility that, just as in films, mathematical images produced by women and men might also be different. Coming directly from our subconscious, gender differences in the way of thinking must be reflected in our work. And when I say our work, I mean something more than research. As I mentioned before, while the difference may not be so evident in the way one works on a particular problem, it is probably clearer in the conception of what our work should be.

I would like to point out some of our concerns. There is a lot written about the fact that we are good administrators. During recent years, there have been women as heads of math departments in Mexico, and a few months ago a woman ended her term as president of the Mexican Math Society. When a woman gives a talk, she is especially worried about people understanding her. This does not mean there aren't many men who also share this concern. It is just that most women make an extra effort to accomplish this. They prepare a talk with great care, and it seems to me, they are more concerned with its pedagogical effect. I might even add that a woman mathematician prepares a talk to be understood, whereas a man is more preoccupied with the impression he is going to make. Of course both men and women are concerned with both aspects, but I am trying to point out where the emphasis is placed.

In my work doing follow-up studies on women who received their undergraduate degree in mathematics at National University of Mexico, UNAM, it came to my attention that there is a high percentage of women doing research in Mathematical Education (over seven percent, which is very high for a single area). I may have some hypotheses about what this means, but I don't want to discuss them here. I will just say that it would seem to show that this is an area of particular interest to women. However, the point I wish to make is that women conceive of their work in mathematics in a different way than men do, and that is probably why we are here today.

So now I come to the topic I was asked to speak about.

I would like to discuss the evaluation system that was introduced during the last few years in Mexico and which has reshaped Mexican academic institutions and had an impact on women as well as men. I want to make clear that what I am going to say is the product of my own personal reflections and is based on the doctoral dissertation of Raquel Glazman ([2], to be published). This is a complex and difficult matter to understand because of all the ramifications it has, and probably Third World countries, for different reasons, feel a greater impact of the system. I think we all agree that there should be personal and institutional evaluations. However, in order to endorse such a process, we should know what its purpose is, how it is to be carried out, and how and by whom it will be used. Different authors propose different ways of evaluation, and underlying each proposal there are sociopolitical ideas playing a fundamental role. Consequently, you cannot separate the process from the underlying ideas and purposes that the evaluators have.

The big economic crisis in Mexico started around 1982 and its effects have changed Mexico in many profound ways. At that time, salaries for academics were low, as usual, but when the crisis began things really worsened significantly. No one working in an academic institution could live on a single salary, and two salaries were not enough either. No one could even dream of buying a car or a house. People with young families became seriously worried. They did not see any future in the

academic world, and many people left their jobs. Some researchers, well-known outside Mexico, went abroad. Others had to look for a second or even a third job. Many completely abandoned public universities and institutes, where most of the research work is done in Mexico. Some moved to private institutions where they had long teaching hours and no time for research. Considering the investment that is made in a country in training its people, especially by public institutions, and the time it takes to establish a stable group, there was great concern among academic authorities about what was happening. Losing its best heads was a luxury that Mexico could not afford. I should mention that at this time, many women mathematicians, who had previously gotten married and given up their jobs, became active again in order to bring home a second salary.

Around 1983 or 1984, when the crisis in the academic world was reaching its peak, an effort made by an important group of researchers, particularly scientists, brought about a response: the establishment of a national system of research (in Spanish: Sistema Nacional de Investigadores) better known as SNI. Under this system, everyone who wanted to participate had to prove to a special committee that they were qualified to be included in it. Three categories were established, each one involving an additional remuneration to the regular salary the researcher received at her/his institution. There was a selection committee for broad areas of knowledge (precisely, four different committees). Mathematics was put together with physics. Referees belonging to both disciplines had to evaluate each candidate. Samuel Gitler, a well-known topologist, was on the first committee, and the stories he told us were incredible. None of the other referees understood what a mathematician did, nor why her/his work was important. Sammy had to play a clever game: once he slipped in the résumé of N. Steenrod, a Fields Medal winner, and when his résumé was rejected by the committee, Sammy explained whose it was. Of course, none of the members of the committees knew anything about evaluation. They did everything using common sense and sometimes intuition. Although they may have had the best of intentions, they were influenced by their way of thinking and the values that they had.

In 1988, when Carlos Salinas de Gortari was elected president, the system was strengthened and extended to all academics, and not just researchers. Although salaries remained low, additional money could be earned aside from the research compensation as an SNI member, according to one's performance. That is, points would be accumulated during the year, and those points would be exchanged for monetary compensation. This system is still in effect. Since these earnings are not part of one's salary, no benefits are derived from these payments; that is, they are not considered as a basis, for instance, for loans or retirement. Periodically, performance is evaluated according to different criteria, depending on who the members of the evaluating committee are. Consequently, one is being evaluated again and again, and no one can determine what her/his earnings are going to be in the following period. The classification, of course, depends on the referees, none of whom is a professional evaluator, and also on the amount of available funds.

As time went by institutions themselves started to be evaluated, and a list of Institutions of Excellence was established. The National Science Council gives scholarships only to those people entering institutions classified as Excellent. Thus the whole system became endogamous; i.e., people classify as Excellent the institution they work at.

Since this phenomenon is not restricted to Mexico, where do we trace this idea? Its origins may be traced to the neoliberal policies and mechanisms developed in England and the United States in the seventies and which were adopted by Mexico in the eighties as a political and economic strategy for developing an open economy, to free its markets, and to reorganize and modernize them. According to Raquel Glazman [2] neoliberalism severely criticizes the welfare state (health, education, housing and social security) and tries to refute it. I quote from Daniel Bell [3]:

The heart of the liberal argument is that men differ in their capacities, needs, aptitudes and talents. Thus one has to distinguish between treating people equally and making them equal. (El nucleo del argumento liberal es que los hombres difieren en sus capacidades, actitudes y talentos. Asi es menester distinguir entre tratar a la gente de manera igual o hacerlos iguales.)

Measures that are aimed at protecting political and economic proposals lead to political decisions and policies which are made to protect production factors and to accelerate the economic development of countries (without taking into account other important factors, such as the social impact). All this leads to the establishment of reforms that

involve new ideological conditions and new forms of social relations where competition and efficiency are reinforced. Education is linked to productivity. Accordingly, efficacy and efficiency are guaranteed through evaluation. At the same time, the critical function of the public university is ignored and new university functions are contemplated. Through the hidden curriculum, hierarchical changes in knowledge are considered and research areas are transformed. The government keeps control through institutional evaluation. Thus, evaluation constitutes a political measure to promote neoliberalism. Since one of the characteristics of neoliberalism is to protect and favor the elite, the small group who have been classified in the highest categories have become decision-makers, and decisions are made to favor their interests (and points of view), both politically and economically.

There has never been a woman referee on the SNI Math Committee. Women's vision has not been taken into account. Women's lines of thought have not been considered. It is more difficult for a woman to confront this type of committee and fight for her rights, at least in Mexico, undoubtedly due to the long tradition of cultural conventions in this regard. In the long run, this will change as more women are involved in mathematical work. But so far, there still a big gap in how women are evaluated, as you can appreciate in the slides to the right. According to the catalogue of human resources 22 per cent of all mathematicians who are members of the SMM are women.

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[3] Bell, Daniel. *The contradictions of capitalism*, Basic Books Inc. (1st edition, 1976, twentieth anniversary edition,1996) In Spanish: *Las contradicciones culturales del capitalismo*. Alianza Universidad. Madrid.

Minping Qian, Peking University, China

Ten to fifteen years ago, women in cities in China had relative equality with men. This relationship did not extend to the large population in the countryside, where the tradition of thousands of years, together with continuing poverty, meant

IMATE UNAM PRIDE

Level A	Level B	Level C	Level D
1 Women	5 Women	2 Women	2 Women
5 Men	27 Men	19 Men	14 Men

FC UNAM PRIDE

Level A	Level B	Level C	Level D
5 Women	9 Women	12 Women	0 Women
9 Men	6 Men	17 Men	9 Men
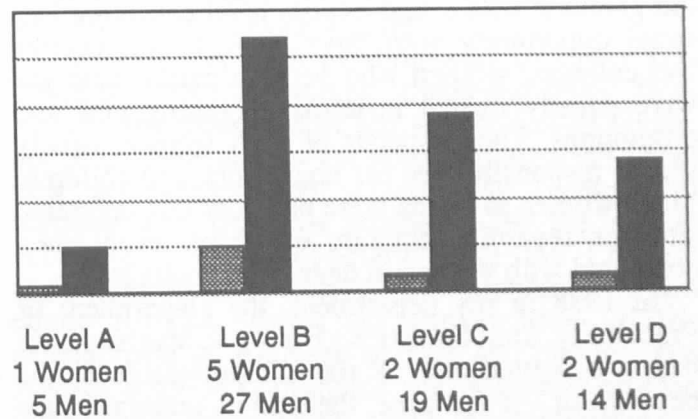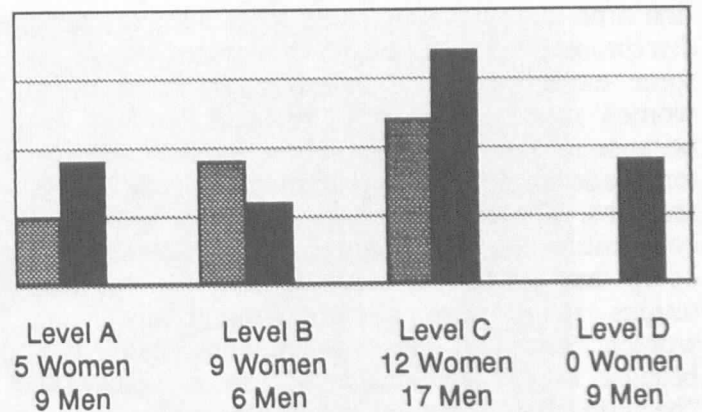
SISTEMA NACIONAL DE INVESTIGADORES (SIN)
NATIONAL SYSTEM OF RESEARCHERS

Candidates	Level 1	Level 2	Level 3
15 Women	18 Women	4 Women	0 Women
49 Men	104 Men	45 Men	20 Men
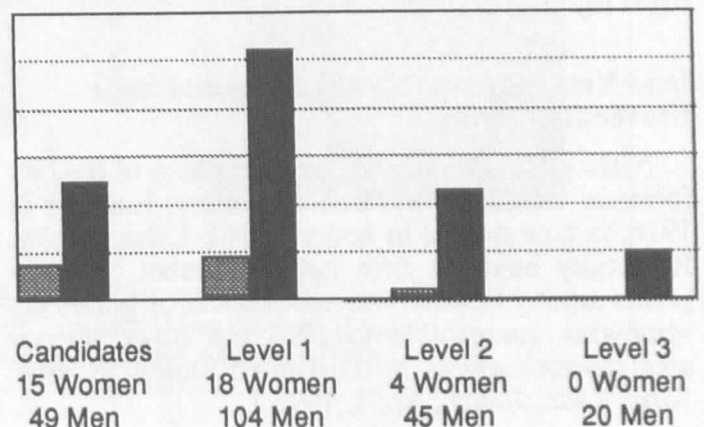
many girls did not have even a complete elementary school education. However, at that time, girls who did graduate with a high school level education had equal opportunity with boys to go to universities and colleges; women who became mathematicians were equally treated in terms of getting jobs and promotions. The husbands of such women usually shared responsibilities for housework and children. Many women in China were proud of this favorable situation regarding equality with men, even when compared with women in developed countries.

In 1988 in my department, the Department of Probability and Statistics, Peking University, we had two women out of six full professors in the department. At that time, the woman undergraduate and graduate students were each about one-third of the total students at those levels — almost exactly proportionate with the full professors.

In the past ten years, however, along with the economic reform, this status concerning proportions and equality has been changing gradually. For the first time there have appeared large numbers of job discrimination cases involving women. I have had some experience with this through some of my women students who were rejected for jobs only because they were female. These women were better, academically, than some men students who got the jobs. Theoretically, such action is against the constitution of the country. When I asked how could they do this, I was told that in those institutions there were already "too many young women" and that the women were rejected not because they were considered low in ability, but "because they [women] were practically hard to manage."

I discuss here this new problem we are now facing in China since I hope that we, Chinese women mathematicians, can learn some experiences of other women as we try to struggle and defend our equal rights.

Inna Yemelyanova, Nizhny Novgorod State University, Russia

Nizhny Novgorod is the present name of the city formerly called Gorky. The university, founded in 1916, is now named in honor of N.I. Lobachevsky. Its faculty hold the fifth largest number of Soros grants among Russian universities. Soros grants are somewhat comparable to NSF and other science area research grants in the United States. [Source: *Soros Educ. Journ.*, No. 1, 1996.]

"Who is who in Nizhny Novgorod University. 1918–1993" [N. Novgorod Univ. Press, 1994] gives cumulative numbers of appointments in three faculty categories. The percentages of women in each of these categories are: 2%, full professors (Doct. Sci. in Physics or Mathematics); 19%, Ph.D. in Physics or Mathematics; 46%, without Ph.D. degree in Physics or Mathematics. Further, the figures indicate that of this already small percentage of women holding faculty appointments, the women are appointed only one-half to one-third as often as men to the most prestigious level of faculty position [chief; similar to an academic chair].

A major problem for all faculty is the economic situation and cuts in education spending. Due to the funding crisis there have already been drastic decreases in allocations to fundamental science in Russia and future severe cuts are projected (e.g., in 1999–2001 the funding is projected to be cut again by 20%); the employment situation is not clear at all.

An indication of the attitudes of women who are university faculty is provided by a survey of pre-college school teachers, of whom 85–90% are women. When women school teachers were queried on several characteristics of their students' future prospects the percentages giving a positive answer were: 10%, will enter a prestigious profession; 10%, will have highly paid work; 20%, will receive a good (university) education; 30%, will have skilled medical service; 40%, will have opportunity for recreation and travel; and 70%, will have opportunities to visit cultural centers. A question to teachers about changes in their standard of living over the past two years was answered: 53%, bad and becoming worse; 26%, as bad as in previous years; 8%, the same and not too bad; and 12%, hard to say. About 68% of teachers are considered to be on the brink of poverty. [Sources: Demidova I.V., Sociological Institute of Russian Academy of Sciences; and "Women in education." *The First practical seminar. Abstracts of reports.* N. Novgorod Univ. Press, 1997, pp. 47–49.]

One bright note for Russian women mathematicians was the recent fifth anniversary of the founding of the Russian Association Women-Mathematicians (RAWM). The founding meeting of RAWM was held in Suzdal in May 1993. The Association was created to provide information, consulting and social support for women who had chosen mathematics as a sphere of their scientific activity. Four conferences followed, at Pushino (1994), Voronezh

(1995), Volgograd (1996), and Rostov-on-Don (1997). More than 600 women mathematicians from Russia and other countries (Argentina, Australia, Azerbaidzhan, Belorussia, China, Columbia, Great Britain, France, Holland, Ireland, Japan, Kazakhstan, Pakistan, South Africa, Ukraine, USA, Uzbekistan, Yugoslavia) have participated in these conferences. There was some conference support: UNESCO (1994, 1995), Mathematica (1993), and ISF (1995).

The Sixth RAWM International Conference "Mathematics. Education. Economics" was held May 25–30, 1998 in Cheboksary. This sixth conference included discussions of mathematical research, the integration of university and school education, humanities component in mathematical education,

and mathematical models in economics and engineering. Discussions on social, professional, youth, and ethics questions took place.

Goals of this sixth meeting were to foster new contacts between women mathematicians from Russia, new countries of the former Soviet Union, and elsewhere and to exchange information about new achievements in science and methods of teaching and women's adaptation to the market economy. Since Cheboksary is in the Chuvash region, in which much of the population is not ethnic Russian, there was consideration of the development of Chuvash science and culture. The seventh RAWM conference site is Rostov-on-Don (May 1999). Information about the conferences is available at http://mars.biophys.msu.ru/awse.

After the panel: Bhama Srinivasan (USA), Ljudmila Bordag (Germany), Minping Qian (China), Inna Yemelyanova (Russia), Christine Bessenrodt (Germany), Mary Glazman (Mexico), Dusa McDuff (USA), Claire Baribaud (Switzerland), Bettye Anne Case (USA)

SONIA KOVALEVSKY MATHEMATICS DAYS

Four of the Sonia Kovalevsky High School Mathematics Days below were funded by a grant awarded to AWM by Coppin State University and the National Security Agency. Thanks, Coppin State and NSA! St. John's University secured its own funding for their SKHS Day; we encourage other schools to do so.

American University

I am delighted to report to you that our Sonya Kovalevsky Day celebration on March 6, 1999 was a huge success. Dr. Margaret E. Daube-Witherspoon gave a wonderful opening presentation, "Positron Emission Tomography," on the applications of PET to her research at NIH on tumor identification. Her talk demonstrated the relationships among mathematics, statistics, sciences, and communication.

One of our workshops was a special presentation by Dr. Jim White on "Gravitation: The CD." Dr. White is the creator of *Mathwright* and is co-director of the MAA's highly successful Interactive Mathematics Text Project. Participants went to our computer lab and had hands-on experience with this software and the Internet.

Other workshops included "Exploration of the Platonic Solids" by Dr. Hanna Sandler, "Mössbauer Analysis of Archeological Artifacts" by Dr. Romeo Segnan, "A Crash Course on Infinity: From Zeno's Paradox to Hilbert's Hotel" by Dr. Ali Enayat, "An Incursion into Recursion: Designing Your Own Fractal Set" by our undergraduate mathematics majors Rebecca Torrey and Keith McCarron, and "The Wonderful World of Sound," by Vanessa Brown on the physics of audio technology.

We had a wonderful closing session with Dr. Henry Edwards of the University of Georgia on "Students and Computers, the World Wide Web, and Mathematical Modeling for Everyone." Dr. Edwards is coauthor with David Penney of the popular Edwards and Penney calculus text used throughout the country. The talk featured his recent work on an elementary treatment of modeling suitable for precalculus students and the development of material delivered to students on the world wide web.

Teachers attended a two-part workshop on "Writing in the Mathematics Classroom" and "Rubric Grading" given by Dr. Linda Hackett of American University. The teachers were particularly intrigued by rubric grading practices used at our university and the extent to which students can become involved in analyzing their progress in mathematics.

As always, our group problem-solving event was a favorite of many. The participants were challenged to find the shortest distance between two points around scattered slices using segments less than two inches long to create a structure rigid in two dimensions. The prizes were given to the solution using the fewest segments and to the solution that was the most artistic.

Sixty-two girls and fourteen teachers attended the conference. The evaluations underscored the popularity of all the workshops. Favorites were the logic, the incursion into recursion, and the world of sound workshops.

The Department of Mathematics and Statistics donated five calculators, and Sigma Xi generously gave us a check for the remaining calculator. Prentice-Hall also donated $200 toward prizes.

This event has become so popular that teachers are already trying to reserve a slot for next year. Per repeated requests by participating teachers, we are now considering opening the event up to young men as well. Teachers explained that there are no activities of this sort for their male students, so they are anxious to include them.

Mississippi University for Women

Mississippi University for Women hosted its second Sonia Kovalevsky High School Mathematics Day on March 27, 1999. It was attended by thirty-two high school girls and three teachers. Of the thirty-two students, thirteen were African-American and three were Asian-American. The organizers, panelists, and workshop leaders were all on the faculty of Mississippi University for Women (MUW) or the Mississippi School for Mathematics and Science (MSMS). We sent letters to all of the area high schools inviting them to send students to

Virginia (Lyn) Stallings, Chair, Department of Mathematics and Statistics

Jane Hurley Wenstrom, Ph.D., Division of Science and Mathematics, Mississippi University for Women
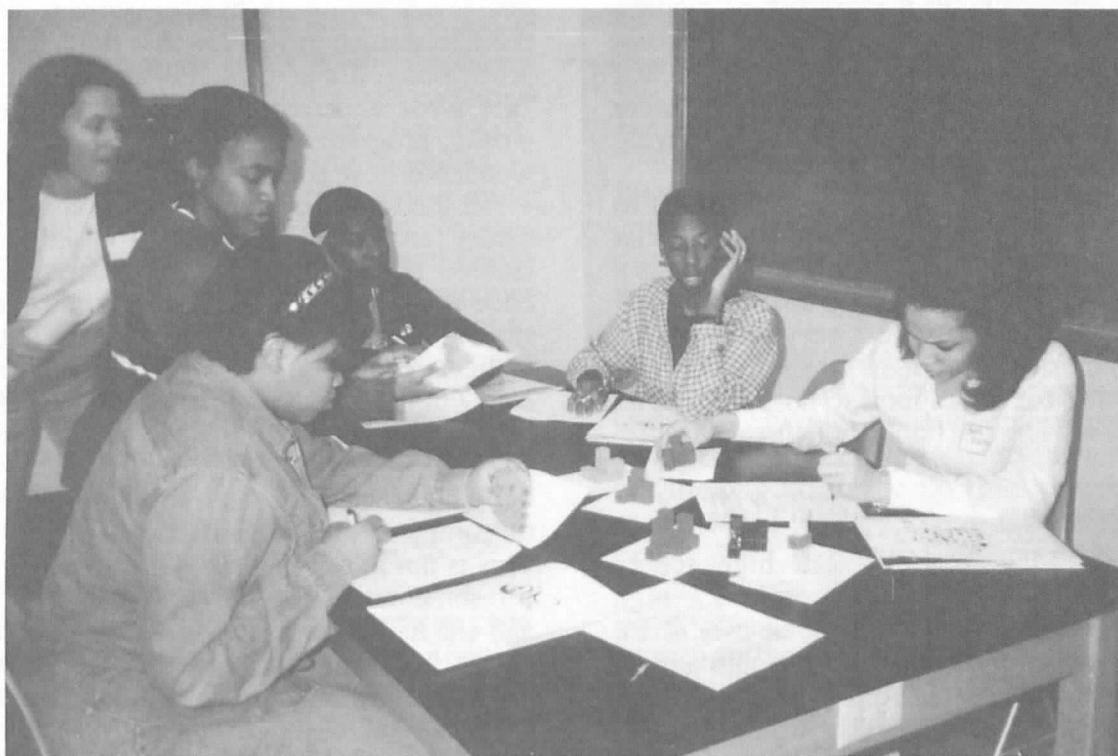
Visualization workshop using multilink cubes, MUW SK Day

participate. We also advertised in the area newspapers, at the annual conference of the Mississippi Council of Teachers of Mathematics, and at the local Mu Alpha Theta mathematics tournament.

The program began at 9:00 A.M. The participants registered and received a packet of materials which contained a schedule of the day's activities, the AWM brochure *Careers That Count*, and some information about MUW. Dr. Jane Wenstrom welcomed the group and gave a brief biography of Sonia Kovalevsky and some additional history of women in mathematics. Most of the students were amazed at the struggles women had to endure in order to study mathematics.

The morning program consisted of two workshops for the students that ran parallel to two workshops for the teachers. The first student workshop on fair and unfair games was led by Dr. Dorothy Kerzel of MUW. The students played a number of games involving coins, dice, and spinners to determine whether they were fair or not. This led to a discussion of the underlying probability theory. The second student workshop on coding theory was led

by Dr. Beate Zimmer of MUW. She discussed some of the mathematics behind coding messages, including binary trees, ciphertext, and block ciphers.

The first teacher workshop, led by Dr. Bonnie Oppenheimer of MUW, was an introduction to Texas Instruments' Calculator-Based Ranger (CBR). The teachers used the CBR to collect data and then worked through some sample classroom activities using the data. The second teacher workshop was an exploration of mathematics on the internet led by Dr. Jane Wenstrom. Web sites visited included the NCTM home page to view the online version of the Standards 2000 and the Ask Dr. Math archive on the Math Forum home page.

After a buffet lunch in the President's Dining Room, the teachers joined the students for the afternoon session. Dr. Oppenheimer led a workshop on spatial visualization using multilink cubes. The cubes were used to explore the relationship between 2D "blueprints" and their corresponding 3D models.

The final workshop of the day was led by Dr. LeRoy Wenstrom and Ms. Kathleen McGarvey of

MSMS. They explained the physics of flight and students proceeded to build paper airplane models. The designs were taken from *The Great International Paper Airplane Book* by J. Mander, G. Dippel, and H. Gossage. Once the models were built, their aerodynamics were observed by flying them outside.

The local CBS affiliate WCBI sent a camera to capture some of the activity and ran a story on that night's local news broadcast. Overall, the day was a definite success. The participants really enjoyed themselves. Their responses were very positive and many were interested in attending again next year. Thank you AWM for the support to host our second Sonia Kovalevsky High School Mathematics Day!

St. John's University

On Monday, May 3, 1999, 212 high school women and 36 of their teachers from 27 high schools in the greater New York area met at St. John's University to participate in its eighth annual Sonia Kovalevsky Day. The schools ranged from public to private and from inner city to suburban.

The Dean of St. John's College, Sister Margaret John Kelly, Ph.D., graciously welcomed the visitors and stressed the importance of such days in helping young people to make informed career choices.

The program began with four panelists, one more than in the past. Ms. Marlene Cintron, a lawyer/financial consultant at Merrill Lynch told the audience that she did not excel in math when she was in high school, but she hired a tutor and never gave up. "Math is everywhere so you need to confront it." She stressed that merely because they are women, they will have problems unique to them: statistically, women live longer and thus the need to save and invest is very important; when a woman starts working after college, she will, on the average, make 76 cents on the dollar compared to her white male counterparts; men with a high school diploma make more money than women with a college degree, so a woman needs to continually strengthen her mathematical skills. She urged the girls to believe in themselves and to work hard. "In the end, the numbers will be in your favor."

Maria Franzetti, a Senior Applications Programmer at New York Life, graduated with a B.S. in math when computers were a new phenomenon.

Anne Hughes and Rora Iacobacci

After taking the only two courses offered on computers and doing an honors project, she was sure that she wanted to work in that field. She started her professional life at a small insurance company — to "get some experience" — and soon found herself writing programs in COBOL. During this time, she wondered how she would use her math knowledge — all the formulas and theorems, along with the set theory and math analysis. To her surprise, she learned about all aspects of insurance, but never once was asked to solve a parabolic equation. What she did use was her math training in logical mathematical processes. She worked with the ingrained conviction from all her math courses that there must be a simple logical approach to each program she was asked to write: step by step, cause and effect, building block upon building block, she proceeded to complete the program to meet user definition. This is not to say that she didn't use her math at all, for some insurance formulas can get complicated and she had to understand the math behind them, or debug the formulas when they didn't work in the programs. Gradually, she gravitated towards those problems and assignments that dealt with actuarial analysis and soon became the liaison person between the actuarial department and the computer division. In this role she found the perfect niche which melded her math background with her computer skills and in which she thrives. In summing up, she noted that her math degree was something that she has always cherished and enjoyed — the mathematical discipline has served her well in career and life.

The third panelist was a mathematician from the National Security Agency, Ms. Heather A. McMonagle. Heather was motivated to pursue studies in mathematics by the wonderful discussions she had with her grandfather who was a professor of mathematics. She majored in math at SUNY, Albany and was planning to become a high school math teacher. While studying for her master's degree, NSA came on campus to interview math majors and never let her go. She loves her job doing analytical work to solve real world problems, but, in particular, she loves the fact that NSA advocates versatility, which enables her to teach in various programs. In ending, she stressed that students must prepare themselves for the professional workplace with the academic skills necessary to execute their dreams.

The fourth panelist, Dr. Jennifer Phillips, an agronomist from the Goddard Institute for Space

Studies (NASA), worked in the field of fashion design for the first ten years of her adult life, but found it unfulfilling and then went on to college. She is currently working on the problem of growing food in space and often travels to foreign countries to confer with engineers, soil scientists, economists, etc. She left the girls with two major thoughts: 1) Don't avoid the natural sciences even if you think you want to go into social sciences or people-oriented work since math and science will only sharpen your logical thinking skills and improve your ability to do problem solving and 2) Try not to let your confidence fail. Believe in yourself even when the world around you may not perceive young women as having strong math or logical skills.

The forum was then opened to the audience so the participants could ask questions. Clearly, the girls were captivated by the words and work of the panelists.

Teachers and students then attended two workshops of their choice. Students were very excited about the workshop on coding given by Heather McMonagle. Her workshop addressed how to make/break various substitution and transposition systems. Students received handouts corresponding to slides, and through the exercises and practice in discovering properties were able to successfully break two unidentified messages at the end of the hour. It was a moment of triumph!

Students were also very happy with the workshop on the five Platonic Solids which was led by two graduate math students at St. John's. Using computer images, manipulatives, and handouts, they engaged the students in discussions of the mathematical properties of these solids, and then guided the participants in constructing models of them. One teacher who attended commented that the enthusiasm of the leaders was infectious.

We decided to celebrate the lives of four pioneer women of the mathematical sciences in a poster exhibition presented during lunch.

The first poster profiled the life of Rear Admiral Grace Murray Hopper ("Amazing Grace," 1906–1992), a mathematician (Ph.D., Yale University, 1934) and leader in the field of data processing who dedicated her life to the Navy. In 1952, she finished her first practical compiler (the language processor that translates an entire high-level language program into its machine language equivalent) and by 1960, she developed COBOL which is used to this day. In 1945, she traced an error in the Mark II computer to a moth trapped in a relay. The bug was carefully removed and taped to a daily logbook. Since then, whenever a computer has a problem, it's referred to as a *bug*. An excellent teacher, her favorite admonition to a class of aspiring naval officers was "remember your nanoseconds" (a billionth of a second) in writing efficient programs.

In her retirement speech, Admiral Hopper talked about moving towards the future and stressed the importance of giving young people positive leadership. She spoke widely on the dangers of stagnation. In her opinion, the most damaging phrase in the language is "We've always done it this way." Embracing the unconventional, the clock in her office ran counterclockwise. Her signature message to the world was, "Be innovative, open-minded and give people the freedom to try new things." After her lifelong efforts to do this, she declared, "It is easier to beg for forgiveness than to ask for permission."

The second poster profiled the life of Evelyn Boyd Granville (1924 –), one of the first two black women in the U.S. to receive a doctorate in mathematics (Yale University, 1949). As an undergraduate at Smith College, Evelyn concentrated her studies in mathematics, theoretical physics and astronomy. After receiving her Ph.D., she accepted an appointment at Fisk University which attracted very capable math majors including Dr. Vivienne Malone-Mayes, profiled below. In July 1952, Evelyn returned to her home town of Washington, D.C. and began a 15-year span of positions in government and industry including orbit and trajectory computations ("the most interesting job of my lifetime"), numerical analysis and computer procedures for Projects Vanguard, Mercury and Apollo. She continually developed expertise as an applied mathematician.

In the summer of 1967, due to a decline in government contracts, Evelyn accepted a teaching position at California State University at Los Angeles, from which she retired in 1984, and shortly thereafter joined the faculty of Texas College in Tyler, Texas where she taught computer science until 1997. In 1989, she wrote, "My plans for the future are not firm, but I know I want to be involved in the educational process in some way. The excellent education and training I was privileged to receive place upon me an obligation to improve educational opportunities for others."

The third profile was of Dr. Vivienne Malone-Mayes (1932–1995). Vivienne received her B.A. and M.A. from Fisk University in Tennessee and, in

1961, during the heat of the civil rights movement, was accepted for doctoral studies by the University of Texas at Austin (Ph.D., 1966). Commenting on her intellectual experience at Fisk, she recalled, "One thing that I really felt Fisk had done to me was give me a sense that learning was an important thing." Two of her math professors, Evelyn Boyd Granville and Lee Lorch, directly shaped her future. Because of their influence, she changed her major from chemistry to math. "The greatest thing they did for me was teach me how to read mathematics. Lorch said, 'You never sit down with a math book without a pencil and paper beside you.' He believed that students could understand the material, not just learn to do it. He was interested in teaching them the why of mathematics in addition to the how...."

In her teaching, Vivienne sought to give her students tools of self-empowerment — she taught them to read mathematics and how to identify and solve problems. She tried to convey that math is a tool for dealing with the world, that logical and reasoning skills should not be isolated and used only in the classroom, but should be applied to life. She also believed that it was critical to allow people the room to fail: "We show the theorems that have been proven, and the correct answers, not the failed attempts and dead ends. But mistakes and false starts are critical to growth and learning."

The isolation that Vivienne experienced in her first year of doctoral studies was very difficult. She had no one to study with, but her philosophy was that ultimately you have to take it on your own shoulders. "You can't ask anybody to help out — no one owes you this.... If you flunk, well, you just took too much. I just did the best I could." Vivienne's perseverance paid off. In the end, she not only succeeded in getting mostly A's, but was offered a job at Baylor University where she had earlier been denied admission to graduate school.

The final poster featured Patricia L. Eng, a nuclear engineer, who is currently Chief of the Transportation and Storage Inspection Section at the U.S. Nuclear Regulatory Commission. Patricia didn't plan to be an engineer while growing up, but rather wanted to be a ballet dancer or a gymnast. In the process of studying physics, and particularly the physics of the human body in motion, she gravitated to engineering. Hardly any two days are alike in her work. "Some days, I get very technical and look at engineering calculations to determine if a design is right or not, and sometimes I get out to the field where I can see hardware and how it is made. On a few occasions, I go overseas and see how different nations solve the same problems in different but effective ways."

Ms. Eng thinks the biggest challenge she has had in her career has been to know herself and trust her instincts, particularly in knowing her strengths and compensating for her weaknesses. Her current goal is to do well in her new job. She must completely change how her group is doing business, but in a way that "we are all empowered and we work together to develop the solutions." Her guiding words are, "If you are thinking of studying engineering, hang out with women who have gone into engineering.... See the possibilities and find people who can help you hang on. Then someday, you will be there to help someone else hang on."

After lunch, all gathered to hear the day's guest speaker, Ms. Peggy Oliveira, a multimedia consultant who majored in mathematics at St. John's University. Among her many professional credits, she has designed and built several computer games for the Walt Disney World Epcot Center and various computer museum venues.

Ms. Oliveira noted that if you had asked her 15 years ago, at her college graduation, if she would be doing the type of work that she does today, she most certainly would have laughed. At that time, it would have been very difficult to even imagine the tremendous impact that technology and new media would have on the economy and the workplace. Two of the jobs she has held since college did not exist when she graduated. Luckily, she was able to apply her non-job-specific math skills (logic, reasoning and problem solving) in creative ways in these new work environments. Based on her experience, she shared three rich insights for those just starting to think about the work world that they will enter:

You will have jobs in the future that do not exist today. You will develop and work on products, projects and processes that you cannot imagine right now. This will be both exciting and terrifying. You will need a solid education to be ready to meet these new challenges and to get the great jobs. Your formal education is only the beginning — you will have to continually learn to keep up in your industry.

You will have to be a team player — and sometimes a team leader. One of the important skills you need to develop is the ability to work well with a diverse team of people — good teams are able to blend their different skills together to

achieve new ideas and results.

You have a unique set of talents and gifts. Part of your lifelong job is to find those gifts, develop them, and use them in ways that bring joy and other good things to you, your family and the community.

To end the day, students participated in three fun math bowls, one for freshmen and sophomores and two for juniors and seniors. The problems were challenging and revealed some very clever reasoning by the students. A New York Hall of Science puzzle was given to each participant as a prize.

The student evaluations revealed an appreciation for the information and experiences of the day:

> The morning panel helped me think more of what I would like to become. The talks changed my feelings about mathematics because now I know many different fields mathematics can branch off into.

> Before today, I didn't consider taking mathematics as a major. Now I would.

> Math now seems more relevant to everyday life. I liked learning that there is a lot of math in the heart for this linked math and science.

And from the teachers:

> The panel of speakers was a powerful reminder of the importance of role models in encouraging young women to study math.

> The panelists were very good. Their honesty about their challenges was important to share. I think it was great for the girls to hear that there are hurdles to overcome.

> We need more days like Sonia Kovalevsky Day!

Once again, we would like to thank AWM for their unfailing cooperation and commitment, without which we could never have accomplished as much for the teachers and students.

Ursuline College

On Wednesday, March 24, 1999, Ursuline College held its Women in Science and Math Day, of which the Sonia Kovalevsky High School Mathematics Day was a major component. This event was sponsored by the Association for Women in Mathematics and Ursuline College's Math and Science Departments, along with assistance from the Cleveland Scholarship Program. The inclusion of

the Sonia Kovalevsky High School Mathematics Day as a focus of the event marks this as Ursuline's most successful Women in Science and Math Day. Ursuline was extremely pleased that 174 local high school students and twenty-eight teachers from twenty-eight schools participated. These numbers represent twice the number we originally anticipated. The participating schools ranged from small private schools to the large inner-city schools of Cleveland, Ohio, reflecting a positive trend in the increasingly larger number of minority students attending our program.

At 8:45 A.M., the students were greeted by Ursuline math and science students (navigators) and directed to the registration area where they received a packet of information. They were then welcomed to campus by Ursuline College President, Sister Diana Stano. After enjoying a continental breakfast and some mingling, students and teachers were guided by navigators to the first hands-on session of their choice. Throughout the day eleven hands-on sessions were available to the students. The sessions which focused on or included math concepts were as follows: Graphic Material, The Plot Thickens (plotting numbers with technology), Cardiovascular Fitness (utilizing formulas for EKG's, blood pressure, pulse, etc.), Nutrition & Wellness (using math in balanced diets), Fast Reactions (using math in chemistry), and The Web of Life (technology and math and science).

In addition to the hands-on activities, participants had the pleasure of listening to and talking with two speakers, both successful representatives of their fields. The keynote speaker was Dr. Tammie Bettinger, Coordinator of Scientific Research at the Cleveland Metroparks Zoo. Dr. Bettinger, in the course of giving a lively account of her experiences as a researcher at the zoo, emphasized how valuable her first career, accounting, and her background in mathematics is to her present career. The luncheon speaker was Catharine Mayhew, Biostatistican at the Cleveland Clinic Foundation. Ms. Mayhew engaged the participants with a narrative of her entry into her field and an account of the opportunities and challenges for women in the field of mathematics.

Throughout the day, conversation between professional women, college students and high school students was invaluable. Participants learned about the many interesting and diverse careers available to them if they develop good problem-solving skills and analytical thinking. They were given the

opportunity to learn more about the role mathematics plays in many areas and disciplines. The high school students gained insight from the college students with respect to math majors, job opportunities and course loads. They were impressed with the variety of careers math majors were considering. Teachers were fascinated with the workshops and took away ideas for their own classrooms.

In a follow-up meeting one week after our event took place, the organizers discussed the strengths and weaknesses of our program and brainstormed ideas for next year. The organizers' assessment was that the event was an extremely successful one. Comments of the participants varied from such positive responses as "It was a very educational experience.... I loved the teachers' interest in the students and the topics being taught" to more negative reactions like "The hands-on session was boring." While the individual evaluation responses were mixed, the overall response was positive. Based on evaluation responses, at least 68 girls were helped to narrow their college/career choices. 117 of the girls felt the experience was a valuable and worthwhile one.

One of our most significant and successful changes from the previous year was the increase in hands-on sessions, and after much discussion it was agreed that even more choices in hands-on sessions should be provided next year and that perhaps an alternative format for the sessions be considered. Other suggestions were that we have only one speaker, or at least separate the speakers with hands-on sessions, and that we have a panel of professionals in the fields of math and science at the luncheon. In addition, it was agreed that, rather than a panel of coordinators, one coordinator who then delegates to others throughout the college would be more effective.

Faculty, staff and students at Ursuline College all feel that the Women in Science and Math Day and the Sonia Kovalevsky High School Mathematics Day is a worthwhile undertaking, and they are enthusiastic about next year.

Valdosta State University

The fourth Sonia Kovalevsky High School Mathematics Day (SK Day) at Valdosta State University (VSU) in Valdosta, Georgia was held on

Kathy Simons and Denise T. Reid

Thursday, April 15, 1999. It was supported by a grant from the Association for Women in Mathematics, the National Security Agency and Coppin State University. Sixty students and twenty teachers from thirteen schools attended. Some participants came from across town while others made at least a two-hour trip to VSU. The students were sophomores and juniors. Many had never previously attended a math day of any kind.

The participants had a full day of activities. There were three workshops, one on graph theory, one on chaos, and one on binary numbers. The graph theory workshop was led by Dr. Gerald Petrella from VSU. During this activity, the students learned about conflict resolution and map coloring. The chaos workshop was led by two VSU mathematics students, Ms. Parmy Singh and Ms. Kim Collier. The binary number workshop was led by Dr. Denise T. Reid, also from VSU. During this workshop, the students were each given a set of "magic cards" and shown the binary mathematics behind the trick. The evaluations completed by the participants clearly indicated that the workshops were a success. The students enjoyed the hands-on activities and the interaction among the participants. The career speakers for the day were Ms. Becky McDuffie, an architect, and Ms. Yvonne Lutz of the NSA. Both speakers talked about their jobs and the mathematics involved. Ms. McDuffie's presentation included a slide presentation. Dr. Mary Fares stopped by during the day to talk with the students about the engineering program at VSU. Also included in the activities for the day was a mathematics competition consisting of twenty-five multiple choice questions.

Juice, donuts, and muffins were available when the participants arrived. During this time, the participants registered and mingled. They also had a chance to look at several displays. These displays included posters of the Platonic solids, Fibonacci numbers, and architectural design; brochures on mathematics and career opportunities; origami models and models of Escher Kaleidocycles from a previous SK Day; and a scrapbook of previous SK Days at VSU. Later a buffet lunch was served. During lunch the participants got a chance to interact with each other as well as with speakers and VSU mathematics' faculty.

Door prizes were given to both students and teachers at the opening and closing of the day's events. There were a total of ten student prizes and six teacher prizes. Texas Instruments donated six

Mathematics Competition Winners, Valdosta SK Day: 1st place, Courtney Crosby, Valdosta High; 2nd place, Kortney Gurley, Atkinson County High; 3rd place, Casey Chapman, Valdosta High

TI-36 calculators. Other donations for the day included a dictionary by Houghton Mifflin and pencils by Langboard, Inc. At the closing, the winners of the mathematics competition were announced. The first prize was a TI-92 calculator. The second and third prizes were electronic organizers.

Also in attendance for the day was Dr. Mary Kay Corbitt, Associate Dean of the College of Arts and Sciences. Dr. Corbitt gave the opening remarks of the day which included a biography of Sonia Kovalevsky. There were also several student volunteers present throughout the day. These were VSU students enrolled in mathematics classes.

The day was a success in many ways. Participants completed questionnaires at the end of the day. The responses were very positive. They appreciated the opportunity to be included in such an event. The favorite events of the day were the workshops and speakers. Both teachers and students expressed an interest in attending another SK day. This day would not be possible without the grant that you so generously gave us. We truly appreciate the opportunity to show these young girls how exciting and rewarding mathematics can be.

EDUCATION COLUMN

The question of how to increase the numbers of women and members of underrepresented minorities in mathematics generates a great deal of discussion and study, and even a certain amount of controversy. One element, however, seems to be almost universally accepted: the most dramatic drop-off happens in middle school. And while studies and analyses continue to search for a global solution, a certain number of people and organizations have chosen to take a more local and immediate approach, seeking out students with a mathematical or scientific bent and giving them the skills and psychological fortitude to pursue that bent. While this may not produce an instant balancing of the system, it certainly addresses one of the prime needs of such a balance: that of providing female and minority role models at advanced academic

levels. It also, it seems to me, addresses at least slightly another huge and amorphous problem, which is the attitude of non-scientific society towards science and especially mathematics. Far too many of the young people who feel defeated by math and science go on to contribute to the negative attitude which plagues our fields. A student from one of those programs who chooses to major in history, but retains the feeling that math and science are cool and approachable, does not represent a failure of the program.

One such program has been running for a number of years Seattle, to considerable local acclaim. I asked its director, Patricia Macgowan, to describe it for us, and her response appears below.

The Seattle MESA (Mathematics, Engineering, Science Achievement) Summer Science Program for Girls is a program for seventh and eighth grade girls at the University of Washington focused on Real World Mathematics and Science. A culturally diverse group of middle school girls who are interested in mathematics or science have an opportunity to work in small groups with science and engineering faculty and students at the University of Washington, as well as with peers from across the city who have similar interests in mathematics and science.

The goal of the program is to increase the number of female students pursuing careers in mathematics, engineering, and the sciences.

Curriculum: Five units integrating the use of computers into hands-on science activities designed to facilitate the growth of scientific reasoning were developed using the MESA model based on a partnership between education and industry. Scientists and engineers worked with middle school mathematics and science teachers to develop hands-on activities based on real-world problems. The first unit is focused on the computer. The girls learn the mechanics of the system and then become adept in the use of spreadsheets for organizing, analyzing, and displaying data. Time during the first week is also spent on getting to know each other and developing collaborative learning skills. The second unit is focused on the heart. Students dissect sheep hearts, do a valve replacement, perform bypass surgery, and work with a cardiologist to learn how ultrasound is used as a diagnostic tool. The emphasis then turns to physical fitness and care of the heart. The unit ends with students designing, performing, and analyzing an experiment focused on

modifying heart rate. The third unit focuses on bio-mechanics. The students, using Legos, analyze simple machines, and then work with a bioengineer in analyzing body machines, such as the knee and elbow. The students also visit the prosthetic laboratory to learn how artificial limbs are made. The unit ends with students designing and constructing a robotic arm out of motorized Legos interfaced with computers. The fourth unit is focused on water quality. Students investigate thermal and chemical pollution. They then work with a limnologist to learn how the water in Lake Washington is monitored, and they work with a Seattle water utilities microbiologist to learn how city water is analyzed. The unit ends with a visit to a local wetlands. The fifth unit focuses on forest resources. The students make paper from the paper they have been recycling, and they learn how to become an environmentally smart shopper. They visit the University Demonstration Forest and work with a forester on the health of a forest. The project ends with an awards luncheon to which families and teachers, as well as all participating faculty and scientists, are invited.

Students: A culturally diverse group of middle school girls — African American, Caucasian, Chinese, Filipino, Hispanic, Japanese, Latina, Native American, Thai, and Vietnamese girls — are recruited from the Seattle middle schools. Girls are recommended for the program based on their interest in mathematics or science.

Staff: The Seattle MESA Middle School Summer Science Program for Girls staff consists of two female middle school science teachers who are particularly interested in encouraging young women to enter the sciences. There are also two female teaching assistants who are science or engineering undergraduates at the University. In addition, female faculty and research scientists — cardiologist, bioengineer, limnologist, microbiologist, and forester — work with the girls throughout the program.

Washington MESA in partnership with University of Washington Academic Programs for teachers has developed a curriculum integration distance learning certificate program based on the integrative classroom activities and models used in the Real-World Mathematics through Science curriculum series published by Dale Seymour Publications.

Call 1-800-543-2320 for further information regarding this program. The Washington MESA website is http://wa-mesa.engr.washington.edu.

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND RECENT PH.D.'S

supported by the Office of Naval Research, the National Science Foundation,
and the Association for Women in Mathematics

Over the past eleven years, the Association for Women in Mathematics has held a series of workshops for women graduate students and recent Ph.D.'s in conjunction with major mathematics meetings.

WHEN: An AWM Workshop is scheduled to be held in conjunction with the 2000 Society for Industrial and Applied Mathematics (SIAM) Annual Meeting (July 10–14, 2000) at the Westin Rio Mar Beach Resort and Country Club, in Rio Grande, Puerto Rico. The exact dates of the Workshop are not known at this time.

WORKSHOP: The workshop will consist of a poster session by graduate students, two to four minisymposia, and a dinner with a keynote speaker. The graduate student poster sessions include all areas of research in applied mathematics. Each minisymposium will have a definite focus. The first minisymposium will be informational, directed at starting a career. The remaining minisymposia will be selected from the research areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing and PDEs and Applications. Selected graduate students participants will present their research in a poster session. Selected recent Ph.D.'s (within five years of the degree) will speak in one of the three AWM research minisymposia. AWM will offer funding for travel and two days subsistence for up to 20 participants. Departments are urged to help graduate students and recent Ph.D.'s obtain some supplementary institutional support to attend the Workshop and the associated meeting. All mathematicians (female and male) are invited to attend the entire program.

DISCUSSION GROUP LEADERS: We also seek volunteers to lead discussion groups and to act as mentors for workshop participants. If you are interested in volunteering, please contact the AWM office.

ELIGIBILITY: To be eligible for selection and funding, *graduate students* must have begun work on a thesis problem. Applications should include a cover letter, a summary of their work (1–2 pages), a title of the proposed poster, a curriculum vitae, and a supporting letter of recommendation from a faculty member or research mathematician. Applications from *recent Ph.D.'s* should include a cover letter, a title and abstract (75 words or less) of the talk (to be given if accepted), summary of their work (1–2 pages), and curriculum vitae and may also include a letter of recommendation. Letters of support are encouraged. A recent Ph.D must have received her Ph.D. within the last five years, whether or not she currently holds a postdoctoral or other academic position. (All non-U.S. citizen applicants must have a current U.S. address.) All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a title and abstract (75 words or less) by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification.

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, Maryland 20742-2461
>
> Phone: 301-405-7892
> Email: awm@math.umd.edu   WWW: www.awm-math.org

APPLICATION DEADLINE: Applications must be received by **January 25, 2000**.
Applications via email or fax will not be accepted.

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Through a grant from Coppin State University, Microsoft Corporation, and the National Security Agency (NSA) (*pending final funding approval*), the Association for Women in Mathematics expects to support Sonia Kovalevsky High School Mathematics Days at colleges and universities throughout the country. Sonia Kovalevsky Days have been organized by AWM and institutions around the country since 1985, when AWM sponsored a symposium on Sonia Kovalevsky. They consist of a program of workshops, talks, and problem-solving competitions for high school women students and their teachers, both women and men. The purposes are to encourage young women to continue their study of mathematics, to assist them with the sometimes difficult transition between high school and college mathematics, to assist the teachers of women mathematics students, and to encourage colleges and universities to develop more extensive cooperation with high schools in their area.

AWM anticipates awarding at least six to nine grants of up to $3000 each (*pending final funding approval*) to universities and colleges; more grants may be awarded if additional funds become available. Historically Black institutions and women's colleges are particularly encouraged to apply. Programs targeted towards inner city or rural high schools are especially welcomed. If selected, institutions will receive an information packet consisting of model schedules of activities, a check list for the sorts of arrangements that need to be made, suggestions for securing additional funding and for obtaining prizes to be awarded to contest winners, recruitment and publicity material to be adapted for local use, lists of possible workshop topics for students and teachers, model problem-solving-contest material, and guidelines for follow-up activities and evaluation.

Applications, not to exceed five pages, should include: a) tentative plans for activities, including specific speakers to the extent known; b) qualifications of the persons to be in charge; c) plans for recruitment, including the securing of diversity among participants; d) itemized budget; e) local resources in support of the project, if any; and f) tentative follow-up and evaluation plans.

Decisions on funding will be made late February to early March. The high school days are to be held in Spring 2000 and Fall 2000. Reports on funded high school days are to be made to AWM within four to six weeks of completion. In addition, all receipts (originals or copies) for reimbursement must be submitted to AWM 30 days after the institution's event or no later than December 1, 2000, whichever comes first. Reimbursements will be made in one disbursement; no funds can be disbursed prior to the event date.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; email: awm@math.umd.edu; phone: 301-405-7892. Applications via email or fax will not be accepted. Applications must be received by **February 4, 1999**.

AWM MEMBERSHIP: 1999-2000 Renewal Notices and Gift Memberships

<u>**1990-2000 RENEWAL NOTICES:**</u> Renewal Notices for the 1999-2000 membership year were mailed out in late August and should be received by the end of September. If you have not received your membership renewal notice in the mail by October 15, 19999, please <u>RENEW</u> using the <u>NEW</u> membership form on PAGE **47**. Our new membership year officially begins October 1, 1999, but you can send your dues in <u>NOW</u> and they will be counted toward the 1999-2000 membership year.

<u>**AWM GIFT MEMBERSHIPS:**</u> If you would like to give a gift membership to a <u>friend</u> or <u>colleague</u>, please fill out the membership form on PAGE **47** with the pertinent information and indicate that it is a gift membership. AWM will send a notice to the individual informing of their membership and that it is a gift from you. Remember, the AWM CHALLENGE GRANT is still active (see page 4 for details).

SEND MEMBERSHIP DUES AND/OR CONTRIBUTIONS TO:

AWM Membership, 4114 CSS Bldg., University of Maryland, College Park, MD 20742-2461

Any questions, please contact us at: **301-405-7892 or awm@math.umd.edu**

AWM Events

AWM would like to invite you to our events to be held in conjunction with the Joint Mathematics Meetings at the Marriott Wardman Park Hotel and the Omni Shoreham Hotel
Washington, D.C., January 19-22, 2000

Preliminary Schedule of AWM Events as of August 1, 1999

Wednesday, January 19th

2:45 p.m.- 4:05 p.m. **Panel Discussion:** *"How to increase the number of tenured women in mathematics departments"*
Organizer: AWM President **Jean E. Taylor**, Rutgers University. **Panelists:** Those who have tentatively agreed to be on the panel include: **Millie Dresselhaus**, Institute Professor at the Massachusetts Institute of Technology, **Maria Klawe**, Dean of Science at the University of British Columbia, **Jerry Ostriker**, Provost at Princeton University, and **Karen Uhlenbeck**, Professor at the University of Texas at Austin; provosts from a small college and a public university may also be included.
NOTE: At the conclusion of the panel, AWM will recognize the **10th Annual Alice T. Schafer Prize honorees (winner, runner(s)-up and honorable mention(s).**

4:05 p.m. - 4:25 p.m. **Business Meeting**

6:00 p.m. - 8:15 p.m. **Noether Dinner:** As in the past, AWM will have a get-together with the Noether Lecturer for a casual dinner. If you would like to join us, a sign-up sheet will be at the AWM Table in the exhibit area.

9:30 p.m. **Reception:** entire math community invited; refreshments & cash bar available. Has been a popular, well attended event in the past.

Thursday, January 20th

9:00 a.m. - 9:50 a.m. **21st Annual Emmy Noether Lecture:** *"The Mathematics of Optimization"*
presented by **Margaret H. Wright,** Bell Laboratories, Lucent Technologies
[Abstract: Optimization is an endlessly fascinating field that comes in many flavors, shapes, and sizes. It ranges from research that is entirely theoretical, without apparent connection to any application, to the nitty-gritty implementation of computational methods for solving real-world problems. It not only covers everything in between, but also has deep interconnections with other areas such as linear algebra, differential equations, and approximation. Certain mathematical techniques are widely used in characterizing optimality, developing optimization methods, and proving their convergence in both exact and finite precision. In addition, there are numerous instances in which the needed mathematics comes from far afield. This talk will give an overview, necessarily selective, of the mathematics associated with modern continuous optimization.]
(In conjunction with the Noether Lecture, Wright and Dianne P. O'Leary, University of Maryland at College Park will co-organize a two-part **Special Session on Linear Algebra and Optimization** to be held Friday, 8:00 - 11:00 a.m. (I), 1:00- 6:00 p.m. (II)

4:00 p.m. - 5:15 p.m. **Presentation** to the winners of the **10th Annual Louise Hay Award** for Contributions to Mathematics Education and the **10th Annual Alice T. Schafer Prize** for Excellence in Mathematics by an Undergraduate Woman
These award presentations are held in conjunction with the **Joint Prize Session**. A cash bar reception will immediately follow.

Friday, January 21st

8 - 11 a.m. and 1 - 6 p.m. **AMS-AWM-SIAM Special Session: Linear Algebra and Optimization I & II** (organized in conjunction with the Noether Lecture. Sessions co-organized by Margaret H. Wright, Bell Laboratories and Dianne P. O'Leary, University of Maryland at College Park.)

Saturday, January 22nd

8:20 a.m. - 4:40 p.m. **AWM WORKSHOP featuring presentations by Women Graduate Students and Recent Ph.D.'s**
(tentative time)
The entire math community is invited to attend all Workshop presentations. The AWM Workshop is supported by ONR & NSF. Organizers: Gail Ratcliff, Univ. of Missouri in St. Louis, Catherine Roberts, Northern Arizona Univ. & Sue Geller, Texas A&M Univ.

AWM will have an information table in the exhibit area throughout the meeting. **For more details** on the above events, please stop by the **AWM Information Table** for an **AWM Events Program** or refer to your **Joint Mathematics Meetings Program** at the meeting

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✱ ✱ Address Change? – Position Change? Please let AWM know! ✱ ✱

Please inform us of <u>any changes</u>, so we can keep our database up-to-date. Let us know if you move, get a new job, change phone numbers, etc. We want to know. We don't want to loose contact with you. Because we send the *AWM Newsletter* by third class bulk rate, the post office will not forward mail to you or notify us of address changes. Therefore, we must rely on <u>YOU</u> to notify us of <u>ANY CHANGES</u>. Just fill out the changes using the form on the <u>BACK COVER</u> or drop us a postcard or email, and we'll take care of it. Thanks.

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CALIFORNIA POLYTECHNIC STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - **Mathematics Education** - Tenure-track position beginning Fall 2000. Salary commensurate with qualifications and experience. Responsibilities include teaching methods courses for prospective K-12 teachers, supervising student teachers and senior projects, and teaching mathematics courses. Requirements: Doctorate in mathematics education with the equivalent of a master's degree in mathematics, or a doctorate in mathematics with significant experience in teacher education. Pre-college teaching experience and a background in educational technology and assessment are strongly desired. Submit Cal Poly application form, resume, statement of professional goals, three letters of reference, and transcripts to: **Chair, Mathematics Department, Cal Poly, San Luis Obispo, CA 93407.** (Refer to Recruitment Code #03005 on all correspondence.) All materials must be received by the closing date: December 17, 1999. 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 under-represented groups. AA/EEO.

DAVIDSON COLLEGE - DEPARTMENT OF MATHEMATICS - Applications are invited for a regular appointment in the Mathematics Department, with an initial two-year appointment at the Assistant Professor level to begin August 1, 2000. Completion or imminent completion of the Ph.D. is required. Candidates must be committed to outstanding teaching and continuing scholarly activity. The teaching load is 5 semester courses per year. Some computer science background is desirable. A completed application consists of a statement of professional aspirations and goals, resume, (photocopies of) graduate and undergraduate transcripts, and 3 letters of reference, of which at least one must specifically address the applicant's teaching. These materials should be sent to the attention of **Prof. Stephen Davis, Chair, Department of Mathematics, P.O. Box 1719, Davidson College, Davidson, NC 28036-1719.** (Email: stdavis@davidson.edu; see also the "Information for Applicants for Faculty Position" link at http://www.davidson.edu/math/.) Applications received by November 30, 1999, will receive fullest consideration. Davidson is a highly selective, nationally ranked four-year liberal arts college with a Presbyterian heritage. Davidson College is an Equal Opportunity Employer; women and minorities are encouraged to apply.

GRAND VALLEY STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND STATISTICS - Grand Valley State University, in Allendale, Michigan, is accepting applications for the position of Assistant Professor of Mathematics, starting August 2000. Deadline is December 3, 1999. For information about our department and details on applying, go to **www.gvsu.edu/mathstat/MATH99.html**

INSTITUTE FOR ADVANCED STUDY - SCHOOL OF MATHEMATICS - The School of Mathematics at IAS has a limited number of **memberships**, some with financial support for research in mathematics at the Institute during the 2000-01 year. Candidates must have given evidence of ability in research comparable at least with that expected for the Ph.D. degree. Avi Wigderson, who joined the School Faculty on July 1, will lead a special program in computational complexity theory during the 2000-01 academic year, and James Arthur of the University of Toronto will give an advanced course on the trace formula and applications. THE SCHOOL OF MATHEMATICS and the DEPARTMENT OF MATHEMATICS AT PRINCETON UNIVERSITY have established the **Veblen Research Instructorship**, and three-year instructorships will be offered each year to candidates who have received their Ph.D. within the last three years. The first and third year of the instructorship will be spent at Princeton University and will carry regular teaching responsibilities. The second year will be spent at the Institute and dedicated to independent research of the instructor's choice. Application materials for both the IAS MEMBERSHIP and the VEBLEN RESEARCH INSTRUCTORSHIP positions may be requested from **Applications, School of Mathematics, Institute for Advanced Study, Olden Lane, Princeton, NJ 08540** (609)734-8112, email: Applications@math.ias.edu. Forms may be downloaded but not submitted via a web connection to: http://www.math.ias.edu. Both application deadlines are December 1, 1999.

INSTITUTE FOR MATHEMATICS AND ITS APPLICATIONS - UNIVERSITY OF MINNESOTA - IMA announces a program on **Mathematics in Multimedia (2000-2001)** - ORGANIZING COMMITTEE: Michael Barnsley, Rosemary Chang, Tony Derose, Stu Geman, Peter Olver, Roni Rosenfeld, Larry Schumaker, Ahmed Tewfik. A ONE-YEAR PROGRAM WITH THREE PARTS: (1) **Fall:** September - December 2000, **Vision, Speech and Language.** (2) **Winter:** January - March 2001, **Compression Communication and Retrieval.** (3) **Spring:** April - June 2001, **Geometric Design and Computer Graphics.** The mathematical methods for multimedia will be based on stochastic processes and differential equations. There will be a one-week course on Markov processes and statistical estimation at the beginning of the program. TWO-YEAR POSTDOCTORAL MEMBERSHIPS: The second year of the appointment will provide a variety of options to enhance career development, including participation in the ANNUAL PROGRAM: 2001-2002 **Mathematics in the Geosciences.** All requirements for a doctorate should be completed by September 1, 2000. Applicants must show evidence of mathematical excellence, but they do not need to be specialists in the field. The following materials must be submitted (all materials should arrive by January 14, 2000): (1) Personal statement of scientific interests, research plans, and reasons for wishing to participate in the program. (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 two-year positions in Industrial Mathematics, effective September 1, 2000. 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, applied Mathematics or Statistics by September 1, 2000. Postdoctorates will spend 50% effort working with industrial scientists and 50% effort in the regular IMA program. **Requirements and application procedures are the same as for the postdoctoral memberships listed above.** The application forms are available at **http://www.ima.umn.edu/docs/genapp.html.** All correspondence should be sent to either staff@ima.umn.edu or call (612) 624-6066. All correspondence should be sent to either POSTDOC/VISITING MEMBERSHIP COMMITTEE or INDUSTRIAL MATHEMATICS POSDOCTORATE MEMBERSHIP COMMITTEE, **Institute for Mathematics and its Applications, University of Minnesota, 400 Lind Hall, 207 Church St. S.E., Minneapolis, MN 55455-0436.** The University of Minnesota is an equal opportunity educator and employer.

JOHNS HOPKINS UNIVERSITY - DEPARTMENT OF MATHEMATICS - The J. J. Sylvester Assistant Professorship in Mathematics. The Department of Mathematics invites applications for a new nontenure track three year Assistant Professorship to be awarded each year beginning July 1, 2000. Preference will be given to candidates who have received their Ph.D. within the last two years and who have demonstrated high potential in teaching and research in the general areas of Algebra, Analysis, Geometry, Number Theory and Topology. The position carries a teaching load of two courses one semester and one the other semester with a competitive salary and a discretionary research fund. Applications should be sent to: **Appointments Committee, Department of Mathematics, Johns Hopkins University, 404 Krieger Hall, Baltimore, MD 21218-2689** and should include a complete curriculum vitae, at least four letters of recommendation (including a letter concerning teaching) and a description of current and planned research. Applications received by December 1, 1999 will be given priority. The Johns Hopkins University is an Affirmative Action/Equal Opportunity Employer. Minority and women candidates are encouraged to apply.

MICHIGAN STATE UNIVERSITY - DEPARTMENT OF STATISTICS AND PROBABILITY - The Department of Statistics and Probability at Michigan State University has a tenure track Assistant Professorship available beginning August 16, 2000. The candidate should have a Ph.D. with concentration in statistics and/or probability and a strong research and teaching potential. Preference will be given to candidates with research interests in statistics and its applications. Please have curriculum vitae and three recommendation letters sent to: **Search Committee, Department of Statistics and Probability, A415 Wells Hall, Michigan State University, East Lansing, MI 48824-1027.** Selection process will begin December 1, 1999 and continue until position is filled. MSU is an Affirmative Action/Equal Opportunity Institution. Minorities and women are strongly encouraged to apply. <http://stt.msu.edu>

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[←]   promise of research ability in pure or applied mathematics, and have concern for teaching. NON-TENURE TRACK ASSISTANT PROFESSORSHIPS: These are three-year nonrenewable positions. Candidates should have a Ph.D., be able to document an active interest in and exceptional ability for mathematics instruction, and show promise of research ability. Preference will be given to applicants who have experience in the use of technology (such as graphing calculators and/or computer algebra systems) and group learning. Duties will consist of teaching three courses in the Fall and two in the Spring, mainly at the level of calculus. Applicants should send resume, with the *AMS Application Cover Sheet* attached, and have at least three letters of recommendation sent to: **SEARCH COMMITTEE, Department of Mathematics-Hill Center, Rutgers University, 110 Frelinghuysen Road, Piscataway NJ 08854-8019.** An electronic version of the *AMS Application Cover Sheet* should also be sent (see http://www.math.rutgers.edu for details). The Department will begin reviewing applications for tenure-track and tenure positions November 1, 1999 and for non-tenure track positions December 1, 1999 and will continue its review until the positions are filled. Please indicate position(s) desired and give the AMS Subject Classification number of your area(s) of specialization. Applicants who applied in 1998-99 may, if they wish, request to have their previous application reactivated and submit only new materials as they choose. An updated electronic version of the *AMS Application Cover Sheet* should also be sent. Rutgers is an Affirmative Action/Equal Opportunity Employer and encourages applications from women and minority-group members. Updated details on these positions will appear on the Rutgers Mathematics Department webpage at **http://www.math.rutgers.edu.**

UNIVERSITY OF CALIFORNIA AT BERKELEY - DEPARTMENT OF MATHEMATICS – Charles B. Morrey Jr. Assistant Professorships – We invite applications for these special (nontenure-track) positions effective July 1, 2000. The terms of these appointments may range from two to three years. Applicants should have a recent Ph.D., or the equivalent, in an area of pure or applied mathematics. Applicants should send a resume, reprints and/or dissertation abstract, and ask three people to send letters of evaluation to: **The Vice Chair for Faculty Affairs, University of California, Berkeley, Department of Mathematics, Berkeley, CA 94720.** All letters of evaluation are subject to Berkeley campus policies on confidentiality of letters of evaluation, a summary of which can be found on our home page (http://math.berkeley.edu by clicking on People, and then Faculty Positions at Berkeley). 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, 1999. 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 2000 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. Mathematicians whose research interests are close to those of regular department members will be given some preference. Applicants should send a resume and reprints, preprints, and/or dissertation abstract, and ask three people to send letters of evaluation to: **The Vice Chair for Faculty Affairs, University of California at Berkeley, Department of Mathematics, Berkeley, CA 94720.** All letters of evaluation are subject to Berkeley campus policies on confidentiality of letter of evaluation, a summary of which can be found on our home page (http://math.berkeley.edu by clicking on People, and then Faculty Positions at Berkeley). 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, 1999. The University of California is an Equal Opportunity, Affirmative Action Employer.

UNIVERSITY OF CALIFORNIA AT BERKELEY - DEPARTMENT OF MATHEMATICS – Tenured or Tenured Track Positions - pending budget approval - we invite applications for one or more positions effective July 1, 2000 at either the tenure-track (Assistant Professor) or tenured (Associate or Full Professor) level, in the general areas of pure or applied mathematics. TENURE TRACK APPLICANTS are expected to have demonstrated outstanding research potential, normally including major contributions beyond the doctoral dissertation. Such applicants should send a resume, and reprints, and/or dissertation abstract, and ask three people to send letter of evaluation to: **The Vice Chair for Faculty, University of California at Berkeley, Department of Mathematics, Berkeley, CA 94720.** It is the responsibility of the tenure track applicants to make sure that letters of evaluation are sent. All letters of evaluation are subject to Berkeley campus policies on confidentiality of letters of evaluation, a summary of which can be found on our home page (http://math.berkeley.edu by clicking on People, and then Faculty Positions at Berkeley). TENURE APPLICANTS are expected to demonstrate leadership in research and should send a curriculum vitae, list of publications, a few selected reprints or preprints, and the names and addresses of three references to: **The Vice Chair for Faculty Affairs, University of California at Berkeley, Department of Mathematics, Berkeley, CA 94720.** The applicant should indicate whether they are applying for an Associate Professor or a Full Professor position. The department will assume responsibility to solicit letters of evaluation and will provide evaluators with a copy of the summary of policies on confidentiality of letters of evaluation. All applicants are requested to use the *AMS standardized application form* and to 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 material for both Tenure track and Tenure applications no later than November 1, 1999. Applications postmarked after the deadline will not be considered. The University of California 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. Preference will be given to applications completed by January 7, 2000. **(1) Several E.R. Hedrick Assistant Professorships.** Applicants must show very strong promise in research and teaching. Salary $49,300. Three year appointment. Teaching load: four quarter courses per year, which may include one advanced course in the candidate's field. **(2) One or two Research Assistant Professorships in Computational and Applied Mathematics (CAM).** Applicants must show very strong promise in research and teaching. Salary $49,300. Three year appointment. Teaching load: normally is reduced to two quarter courses per year by research funding as available; may include one advanced course in the candidate's field. **(3) One 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 one more advanced quarter course per year. One-year initial appointment, with the option of applying for renewal for a second year and possible longer, up to a maximum service of four years. Salary $52,900. 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 $42,300 or more, depending on experience. **(4) An Adjunct Assistant Professorship.** One year appointment, probably renewable once. Strong research and teaching background required. Salary $45,500-$48,000. 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 or open <http://www.math.ucla.edu/~search> on the World Wide Web, or write to: **Staff Search, Department of Mathematics, University of California, Los Angeles, CA 90095-1555.** UCLA is an Equal Opportunity/Affirmative Action Employer. Under Federal law, the University of California may employ only individuals who are legally authorized to work in the United States as established by providing documents specified in the Immigration Reform and Control Act of 1986.

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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 mathematics. Exceptional promise in research and teaching is required. Positions are generally budgeted at the Assistant Professor level, but sufficiently outstanding candidates will be considered at higher levels. 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 or open <http://www.math.ucla.edu/~search> on the World Wide Web, or write to: **Staff Search, Department of Mathematics, University of California, Los Angeles, CA 90095-1555.** UCLA is an Equal Opportunity/Affirmative Action Employer. Under Federal law, the University of California may employ only individuals who are legally authorized to work in the United States as established by providing documents specified in the Immigration Reform and Control Act of 198 6.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Posdoctoral Positions as J.L. Doob Research Assistant Professor - The Department of Mathematics of the University of Illinois at Urbana-Champaign is soliciting applications for postdoctoral positions. Three appointments will be made starting August 21, 2000; each appointment is for 3 years and is not renewable. These positions are for recent Ph.D. recipients (with a strong preference for those not more than one year past the Ph.D. degree). The Department of Mathematics will provide an excellent scientific environment to pursue research in pure and applied mathematics. The position carries a salary of $41,000 per year. Applicants should send a letter of application, a curriculum vitae and publication list, (please provide hard copies of your application and supporting documents), and arrange to have three letters of reference sent directly to: **Postdoctoral Search Committee, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801-2975.** Email: postdocs@math.uiuc.edu. To insure full consideration, all materials, including letters of reference, should be received by November 30, 1999. We will review later applications, until the search is closed. We encourage use of the application cover sheet provided by the American Mathematical Society and the indication of the subject area using the AMS subject classification number. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Tenure-Track Position - Applications are invited for one or more full time faculty positions to commence August 21, 2000, at the tenure-track (assistant professor) level. Those faculty will be expected to pursue a vigorous research program, and teach graduate as well as undergraduate students. The department will consider applicants in all fields of mathematics, but we intend to show preference in applied mathematics, computational mathematics, mathematical physics, partial differential equations and global analysis, probability theory, algebraic geometry and number theory. Salary and teaching load are competitive. Applicants should have completed the Ph.D. (or equivalent) by the time the appointment begins and are expected to present evidence of excellence in research and teaching. Applicants should send a letter of application, a curriculum vitae and publication list, and also arrange to have three letters of reference sent directly to: **Joseph Rosenblatt, Chair, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801,** Tel. (217) 333-3352, email: search@math.uiuc.edu. It is the responsibility of the tenure-track applicants to make sure that letters of recommendation are sent. For fullest consideration, all materials, including letters of reference, should be received by November 30, 1999; however, applications will be accepted, and interviews conducted, until the positions are filled. We encourage use of the application cover sheet provided by the American Mathematical Society. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Tenured Position – Application are invited for one more full time tenured position to commence August 21, 2000. Those faculty will be expected to pursue an outstanding research program, and teach graduate students as well as undergraduate students. The department will consider applicants in all fields of mathematics, but we intend to show preference in applied mathematics, computational mathematics, mathematical physics, partial differential equations and global analysis, probability theory, algebraic geometry and number theory. Salary and teaching load are competitive. Applicants are expected to have a Ph.D. and a documented record of leadership in research as well as of excellence in teaching. They should send a curriculum vitae, a list of publications, a few selected reprints or preprints, and the names and addresses of three references to: **Joseph Rosenblatt, Chair, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801,** Tel. (217) 333-3352, email: tenure@math.uiuc.edu. The department will solicit letters for the finalists for the tenured positions. We anticipate an on-going search but will begin considering applications and conducting interviews on October 4, 1999. We encourage use of the application *Cover Sheet* provided by the American Mathematical Society and the indication of the subject area using the AMS subject classification numbers. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF MARYLAND, BALTIMORE COUNTY - DEPARTMENT OF MATHEMATICS AND STATISTICS - Chairperson - The University of Maryland, Baltimore County (UMBC) invites applications for the position of the Chair of the Department of Mathematics and Statistics. The Chair is expected to lead the faculty in the development of the department's instructional and research programs, including the anticipated filling of several open faculty positions over the next few years. Candidates should have an earned doctorate in mathematics, statistics, or a closely related field, and be qualified for appointment at the rank of full professor. Commitment to excellence in undergraduate and graduate education, possession of superior leadership and communication skills, and a strong and active research program are required. The department offers programs leading to the BA, BS, MS and Ph.D. degrees in applied mathematics and MS and Ph.D. in statistics. Currently there are 22 full-time faculty members, 25 full-time and 30 part-time graduate students, and 150 undergraduate majors. Further details can be obtained from the department's website at http://www.math.umbc.edu. UMBC is located just outside Baltimore and about 30 minutes from Washington D.C., near major industries, federal laboratories and sponsoring agencies. It has a faculty of over 400 and a student body of approximately 10,000. The campus is in a growth mode and has several facilities under construction. The campus's total research funding is approaching $50 million. Candidates should submit a CV, a statement of professional goals, and the names, addresses and telephone numbers of four references to: **Dr. Geoffrey Summers, Chair of Math/Stat Search Committee, c/o Department of Mathematics and Statistics, University of Maryland-Baltimore County, Baltimore, MD 21250.** Screening of the candidates will begin in November 1999 and will continue until the position is filled. UMBC is an EOE/AA employer.

UNIVERSITY OF MARYLAND, COLLEGE PARK - DEPARTMENT OF MATHEMATICS – Applications are invited for tenured and tenure-track positions in the Department of Mathematics. Strong preference will be given to candidates in (1) Applied analysis, (2) Applied and computational statistics, and (3) Representation theory, but candidates from all areas will be considered. Candidates at all levels will be considered. Priority will be given to applications received by November 1, 1999. Appointments will commence in fall 2000. The University of Maryland is an Equal Opportunity and Affirmative Action employer that strongly encourages applications from female and minority candidates. Please send a curriculum vitae and *AMS Standard Cover Sheet*, and arrange for three letters of recommendation to be sent to: **The Hiring Committee, Department of Mathematics, University of Maryland, College Park, MD 20742.**

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UNIVERSITY OF NOTRE DAME - DEPARTMENT OF MATHEMATICS - Regular Positions in Pure and Applied Mathematics - The Department of Mathematics of the University of Notre Dame invites applications for two positions starting on August 26, 2000. The fields of interest are Applied Partial Differential Equations, Complex Differential Geometry and Related Areas, and Harmonic Analysis. Outstanding candidates in any field connected with the research interests of the department are also strongly encouraged to apply. The positions are at the tenure track level, although higher level appointments are possible for exceptional candidates. The teaching load is one course one semester and two courses the other semester. Salaries are competitive. Applications, including a curriculum vitae, a letter of application, and a completed *AMS standard cover sheet*, should be sent to: **Alexander J. Hahn, Chair, Department of Mathematics, University of Notre Dame, Notre Dame, IN 46556.** Applicants should also arrange for at least three letters of recommendation to be sent to the chair. These letters should address the applicant's research accomplishments and supply evidence that the applicant has the ability to teach articulately and effectively. Notre Dame is an equal opportunity employer and encourages applications from women and minority candidates. The evaluation of candidates will begin November 15, 1999. Information about the department is available via http://www.math.nd.edu.

UNIVERSITY OF OREGON - DEPARTMENT OF MATHEMATICS - Applications are invited for tenure-track positions at all levels in mathematics or mathematical statistics beginning in September 2000. Qualifications are a Ph.D. in mathematics or statistics, an excellent record of research accomplishment, and evidence of teaching ability. Preference will be given to candidates with research interests that complement those currently represented. Competitive salary with good fringe benefits. Send complete resume and at least three letters of recommendation to: **Hiring Committee, Department of Mathematics, 1222 University of Oregon, Eugene, OR 97403-1222.** Closing date is January 6, 2000. Women and minorities are encouraged to apply. The University of Oregon is an EO/AA/ADA Institution committed to cultural diversity.

UNIVERSITY OF WISCONSIN, MADISON - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for possible Van Vleck Visiting Assistant Professorships to begin August 23, 2000. Appointments are for a fixed term of two or three years. The usual teaching load is two courses per semester. Ordinarily only those applicants who have received their doctorate since 1997 will be considered. Promise of excellence in research and teaching is important. Preference will be given to candidates who are likely to interact well with other members of the Department. The Department also expects to have available one or more **VIGRE Van Vleck Assistant Professorships**, partially funded by an NSF VIGRE grant, with a reduced teaching load. VIGRE awards are restricted to U.S. citizens and permanent residents who have received the Ph.D. within 18 months of the start of the award. Applicants should send a completed *AMS Standard Cover Sheet*, a curriculum vita which includes a publication list, and a brief statement of research plans to: **Hiring Committee, Department of Mathematics, Van Vleck Hall, University of Wisconsin-Madison, 480 Lincoln Drive, Madison, WI 53706-1388.** Applicants should also arrange to have sent to the above address, 3 to 4 letters of recommendation, at least one of which must discuss the applicant's teaching experiences and capabilities. Other evidence of good teaching will be helpful. The deadline for applications is December 15, 1999. The Department of Mathematics is committed to increasing the number of women and minority faculty. The University of Wisconsin is an Affirmative Action, Equal Opportunity Employer and encourages applications from women and minorities. Unless confidentiality is requested in writing, information regarding the applicants must be released upon request. Finalists cannot be guaranteed confidentiality.

UNIVERSITY OF WISCONSIN, MADISON - DEPARTMENT OF MATHEMATICS - The Department of Mathematics anticipates openings for one or more positions to begin August 23, 2000, at either the tenure-track (assistant professor) or tenured (associate/full professor) level. Preference will be given to hiring at the assistant and associate professor level. Applications are invited in all areas of mathematics. Areas in which the department wishes to hire in the near future include: real and harmonic analysis, partial differential equations, numerical analysis, probability, and algebraic geometry/number theory. Candidates should exhibit evidence of outstanding research potential, normally including significant contributions beyond the doctoral dissertation. A strong commitment to excellence in instruction is also expected. Additional departmental information is available on our website, http://www.math.wisc.edu. Applicants should send a completed *AMS standard cover sheet*, a curriculum vita which includes a publication list, and brief descriptions of research and teaching to: **Hiring Committee, Department of Mathematics, Van Vleck Hall, University of Wisconsin-Madison 480 Lincoln Drive, Madison, WI 53706-1388.** Applicants should also arrange to have sent to the above address, three to four letters of recommendation, at least one of which addresses the applicant's teaching experiences and capabilities. Completed applications received by November 1, 1999 will be assured full consideration. Additional letters will be solicited by the Department for candidates who are finalists for a tenured position. The Department of Mathematics is committed to increasing the number of women and minority faculty. The University of Wisconsin is an Affirmative Action, Equal Opportunity Employer and encourages applications from women and minorities. Unless confidentiality is requested in writing, information regarding the applicants must be released upon request. Finalists cannot be guaranteed confidentiality.

WAYNE STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are invited for possible tenure-track positions at the rank of Assistant/Associate Professor in any area of specialization. Applications from female and minority candidates are particularly encouraged. There is also the possibility of visiting positions for 2000-2001 in any area of mathematics. Ph.D. in mathematics and a strong interest in research and teaching are required for all positions. Applications should include a signed, detailed vita, description of current research interests, and four letters of recommendation, including one addressing teaching. Solid evidence of excellence in teaching at the undergraduate level is preferred over a statement of teaching philosophy. Applications should be sent to: **William S. Cohn, Chair, Department of Mathematics, College of Science, Wayne State University, Detroit, MI 48202.** Phone: 313-577-2479; Fax: 313-577-7596. Applications received by January 1, 2000 will be given priority. Wayne State University is an equal opportunity affirmative action employer. Wayne State University - People working together to provide quality service. All building, structures and vehicles at WSU are smoke-free.

WESTERN WASHINGTON UNIVERSITY - DEPARTMENT OF MATHEMATICS - Tenure-Track Position(s) - Applications are invited for one or more tenure-track Assistant/Associate Professor positions, to begin Fall 2000. The position(s) may be limited-term if suitable tenure-track candidates are not available. Expertise in statistics is particularly sought; other areas of need include algebra, combinatorics, topology and other areas of applicable mathematics. Ph.D. required; post-doctoral experience preferred. Evidence of effective teaching and scholarly productivity, including recent publications, expected. A very strong record is required for appointment as Associate Professor. Departmental interests include many areas of applied and pure mathematics and math education. Besides our primary commitment to undergraduate instruction we offer a Masters program with 20 students. WWU has about 500 faculty and 11,500 students beside Bellingham Bay between Seattle and Vancouver, British Columbia. Proximity to these cities, the ocean and mountains gives access to many recreational opportunities as well as metropolitan facilities. For full position details see our website www.ac.wwu.edu/~mathweb/ or write to the address below. To apply, submit the WWU summary (available from the web), vita, transcripts, a description of teaching accomplishments and philosophy, and four recommendation letters addressing teaching and research, by December 3, 1999, to: **Chair, Math Search Committee, Mathematics, Western Washington University, Bellingham WA 98225-9063, U.S.A.** WWU is an AA/EOE employer committed to a diverse faculty, staff and student body.

ADVERTISING DEADLINE for the November/December 1999 is: OCTOBER 1, 1999

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AWM's membership year is from October 1st to September 30th. Please fill-in this information and return it along with your DUES to:

**AWM Membership
4114 Computer & Space Sciences Building
University of Maryland
College Park, MD 20742-2461**

The AWM Newsletter is published six times a year and is part of your membership. Questions? (301) 405-7892, or awm@math.umd.edu

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Please include this information in: (1) the next **AWM Speaker's Bureau** (Yes/No) _____ (2) the next **AWM Membership directory listing** (Yes/No) _____

PROFESSIONAL INFORMATION:

If student, GRADUATE or UNDERGRADUATE? (circle one)

Position:
Institution/Company:
City, State, Zip:

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:			
Master's:			
Bachelor's:			

INDIVIDUAL DUES SCHEDULE

Please check the appropriate membership category below. Make checks or money order payable to: **Association for Women in Mathematics.** NOTE: All checks must be drawn on U.S. Banks and be in U.S. Funds. AWM Membership year is **October 1st to September 30th.**

REGULAR INDIVIDUAL MEMBERSHIP.. $ 50 _____

2ND FAMILY MEMBERSHIP... $ 30 _____
   (NO newsletter) Please indicate regular family member: _____

CONTRIBUTING MEMBERSHIP.. $100 _____
   Indicate if you wish for this contribution to remain **anonymous:** ☐

RETIRED or PART-TIME EMPLOYED MEMBERSHIP (circle one)............................. $ 25 _____

STUDENT or UNEMPLOYED MEMBERSHIP (circle one)................................... $ 15 _____

ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO)....**FOR ADDITIONAL POSTAGE ADD** $ 8 _____
   All payments must be in U.S. Funds using cash, U.S. Postal orders, or checks drawn on U.S. Banks.

☐ I am enclosing a DONATION to the **"AWM GENERAL FUND"**............................ $ _____
   Indicate if you wish for this contribution to remain **anonymous:** ☐

☐ I am also enclosing a DONATION to the **"AWM ANNIVERSARY ENDOWMENT FUND"**.......... $ _____
   Indicate if you wish for this contribution to remain **anonymous:** ☐

INSTITUTIONAL DUES SCHEDULE

S/O99

	U.S.	FOREIGN	
_____Sponsoring CATEGORY I (may nominate 10 students for membership)................................	$150	$230	_____
_____Sponsoring CATEGORY II (may nominate 3 students for membership)................................	$ 95	$120	_____

INSTITUTIONAL MEMBERS WILL RECEIVE ONE FREE JOB ADVERTISEMENTS (up to four lines) IN OUR NEWSLETTER PER YEAR. Advertising deadlines are the 1st of every EVEN month. All institutions advertising in the AWM Newsletter are Affirmative Action/Equal Opportunity Employers. Also, Institutions have the option to nominate students to receive the newsletter as part of their membership. NOTE: List names and addresses of student nominees on opposite side or attach separate page. [ADD $15 ($23 for foreign members) foreign members) for each additional student add-on over initial 10 students for Category I; over initial 3 students for Category II]

☐ indicate if GIFT membership FROM: _____   **TOTAL ENCLOSED $** _____

☐ indicate if NEW membership for CHALLENGE GRANT

ADDRESS CORRECTION FORM

☐   Please change my address to:
☐   Please send membership information to my colleague listed below:
☐   No forwarding address known for the individual listed below (enclosed copy of label):
(Please Print)

Name_____

Address_____

_____

City_____ State_____ Zip_____ -_____

Country (if applicable)_____ E-mail Address_____

Position_____ Institution/Org._____

Telephone: Home_____ Work_____

☐   You may include this information in the next AWM Membership directory.

MAIL TO:

Database Corrections
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4114 Computer & Space
Sciences Bldg., University
of Maryland, College Park
Maryland 20742-2461

or E-MAIL:

awm@math.umd.edu

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