CHALLENGE GRANT: AWM has an exciting new challenge grant from an anonymous donor. For every genuinely *new* member of AWM who mentions this challenge grant (*not* a continuing member, including student nominee), a contribution to AWM will be made depending on the date of enrollment on a sliding scale as follows:

$24	before March 1, 1999
$22	during March 1999
	and so forth, down to
$2	during January 2000.

Thus if just one-quarter of the current AWM membership were to encourage just one other person to join (or to give memberships to their best undergraduate students, or colleagues, or parents) during February 1999, AWM would gain an additional $24,000 beyond the membership fees. A little procrastination costs a little, a lot of procrastination costs a lot, in terms of extra income for AWM.

The important things are: get at least one person to join, and write **challenge grant** prominently at the top of that person's application form. (These forms can be copied from the back of the *Newsletter* or from the AWM web site, www.awm-math.org.)

IN THIS ISSUE

PRESIDENT'S REPORT

Greetings again to all AWM members and supporters of women in the mathematical sciences! The primary AWM focus just now is on the meetings in San Antonio and on the changing of the guard.

AWM San Antonio Program

As usual AWM has a full and absorbing schedule of events for the Joint Mathematics Meetings at San Antonio. Wednesday will be a full

day: First there is a special session "What Can We Do to Smooth the Road of Women in Mathematics?" organized with Mathematics and Education Reform, next the AWM panel discussion followed by the announcement of the Schafer prize awards, and then the business meeting. Next is the dinner in honor of Krystyna Kuperberg's Noether Lecture, and the AWM party is after the Gibbs Lecture as usual. On Thursday Krystyna delivers the Noether Lecture, AWM awards the Schafer Prize and the Hay Award at the Joint Prize session, and there are mentoring activities connected to the workshop. The workshop itself will be Saturday. [See page 39 for the full schedule.]

This year's AWM panel discussion, "The education of women in mathematics: An international perspective," will continue the exploration of some of the themes of the joint AWM/EWM panel discussion at the International Congress at Berlin, but with the primary focus on education. Organized with the assistance of Bettye Anne Case (Florida State University), the panel features Claire Baribaud (ETH, Zürich), Ingrid Daubechies (Princeton University), Anna Guerrieri, (University of L'Aquila, Italy), Gloria C. Hewitt (University of Montana), Gail Ratcliff (University of Missouri at St. Louis), Hema Srinivasan (University of Missouri at Columbia), and Chuu-Lian Terng (Northeastern University). The panelists will discuss the effects of various education systems on the participation of women in mathematics and the factors they view as the most beneficial for women. We hope some members of the audience will also give their perspectives on this topic.

Other items of interest at the meeting include an MAA Women and Math Network Poster Session organized by Kathleen Sullivan (Yvonne Greenleaf of Rivier College will present a poster on the AWM SK Days), a panel discussion on "Exemplary women in mathematical careers" conducted by the MAA Committee on the Participation of Women and organized by Carolyn C. Connell, and a panel discussion jointly sponsored by MAA and the Young Mathematicians Network on "Solving the two-body problem."

The Joint Meetings web site highlights invited addresses by two men (John Conway and Sorin Popa) and *three* women; this shows that women have truly arrived at the Joint Meetings! The women featured are: MacArthur Fellowship awardee and Gibbs lecturer Nancy Kopell, "known for her work on leading techniques from dynamical systems theory and its applications to biology and engineering"; Jennifer Chayes, "known for her work on mathematical problems in statistical mechanics and condensed matter physics"; and Joan Feigenbaum, "known for her work on algorithms and distributed data." On a quick count, it appears that there are eight women giving invited addresses at the meeting and 21 men; in particular AWM past-president Chuu-Lian Terng (1995–1997) will give an AMS Invited Address on "Geometry of soliton equations."

Thanks to the NSA

The National Security Agency (NSA) has officially funded AWM's $20,000 request for infrastructure support (such as basic

equipment) as well as a $30,000 grant for AWM and Coppin State College to administer Sonia Kovalevsky Days in 1999. (AWM is still pursuing further SK support from other agencies.) NSA has also officially offered support for the Olga Taussky Todd Celebration. These grants will significantly enhance the operations and effectiveness of AWM in 1999. Thanks, NSA!

Congratulations!

Fan Chung Graham was just elected into the American Academy of Arts and Sciences! The induction ceremony was held October 1998 in Boston.

Ioana Dumitriu of New York University has received the $1000 Elizabeth Lowell Putnam Prize for her outstanding performance in the 58th Putnam Mathematics Competition. The Prize is named for the wife of William Lowell Putnam and awarded "to a woman whose performance on the Competition has been deemed particularly meritorious." Ioana, 1996 winner of the AWM Alice T. Schafer Prize, won the same award in 1997 when she was the first woman to ever score in the top six on the Putnam.

In Memoriam: Alfred Gray

We are sorry to report that Alfred Gray, husband of AWM's first president Mary Gray, died suddenly October 27, 1998 in Bilbao, Spain, where he was a visiting professor at the Universidad de Pais Vasco. A good-humored and likable person, Alfred always supported Mary's activities with AWM. Both Alfred and Mary were active in Amnesty International; donations in his memory may be made to AIUSA. A synopsis of Alfred Gray's contributions to mathematics may be found at the University of Maryland math department website, www.math.umd.edu/newletter/gray.html.

Farewell and Hello

On February 1, 1999 Jean Taylor of Rutgers University becomes the new AWM President and I become Past President. Thank you all for giving me the opportunity to serve as president of AWM and for all your help during the past two years. In this position I have been caught up in a delightful whirl of travel, meeting people and speaking on behalf of AWM and women in mathematics. Although I see lingering discouragements for women, I also see

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AWM DEADLINES

Sonia Kovalevsky Days: January 20, 1999

Olga Taussky Todd Celebration: February 18, 1999

Minisymposium at ICIAM: February 28, 1999

Alice T. Schafer Prize: October 1, 1999

Louise Hay Award: October 1, 1999

AWM CALENDAR

San Antonio Joint Meetings, January 13–16, 1999 (see page 39 for schedule)

AWM Workshop, SIAM meetings, Atlanta, May 14–15, 1999

AWM-EWM-SIAM Minisymposium at ICIAM 99, July 5–9, 1999, Edinburgh

Olga Taussky Todd Celebration, July 16–18, 1999, Mathematical Sciences Research Institute, Berkeley

many improvements. I rejoice in the large number of outstanding young women entering our profession, in the respect AWM receives from the community, and in the work our volunteers and staff continue to do to improve our profession and the status of women in it. It has been an overwhelming and exhilarating experience: meeting wonderful people, participating in the good that AWM does, and seeing how AWM members rally to assist the Association with its many projects.

In the next issue, we will give a list of AWM's principal activities and accomplishments of the past two years. A lot has happened, and it would never have happened without all of you. Particular thanks go to our capable and efficient staff Dawn Wheeler, Doug Farquhar, Roya Jaseb, and Cynthia Wong; to Meetings Coordinator Bettye Anne Case, Newsletter Editor Anne Leggett, Web Editor Tammy Kolda, President-Elect Jean Taylor and past president Chuu-Lian Terng. We also thank the Executive Committee, the AWM selection committees, the AWM workshop participants, and AWM's sister mathematical societies. We are especially grateful for funding support from the Exxon Education Foundation, the National Science Foundation, the National Security Agency, and the Office of Naval Research.

More thanks go to all the past-presidents, officers and other volunteers who left such a glorious legacy to AWM, who often worked in isolation and against the establishment in order to substantially improve the mathematics community and its climate for women.

Jean and I have tried to capture the magic and the momentum of AWM in the 1990s in our article for the January AMS *Notices*. The first part of an expanded version of that article appears in this *Newsletter* (pages 8–12). That article contains our impressions and our hopes for the future.

At the beginning I had many dreams of what I could accomplish; now most of these dreams have been passed on to Jean's capable hands. As Past President, I will assist her as much as possible, both to help AWM sustain the fine record so many have worked to build and to repay Jean for all her help over the past year. She will be a fantastic president, and AWM will thrive under her leadership.

Best wishes for 1999
and beyond!

Sylvia

Sylvia Wiegand
Lincoln, Nebraska
November 29, 1998

AWM MENTORING FORUM

Mentoring and Story-telling

One of the most significant roles played by the AWM is its sponsorship of mentoring programs. For graduate students and postdocs, we have the AWM workshops at the annual joint meetings and the SIAM summer meeting, the Julia Robinson Conference, and the upcoming conference in memory of Olga Taussky-Todd. In addition the NSA provides us with funding for the Sonia Kovalevsky days for high school girls.

Last spring, I attended the Women's Program at IAS as part of the IAS/Park City Mathematics Institute. Organized by Chuu-Lian Terng and Karen Uhlenbeck, this program brings together graduate students, postdocs and senior faculty for a two-week series of lectures, problem sessions, meals and discussion groups.

One of the common elements of these mentoring programs is that women have a chance to tell their stories: How they became interested in mathematics; how they dealt with graduate school, advisors, job searches, two-body problems, tenure review, and their plans for the future. We see this theme in the recent book of Claudia Henrion, which includes biographical essays of many well-known women mathematicians. In Constance Reid's *Julia*, we read about the life of her sister, Julia Robinson.

While there is a lot more to mentoring than telling stories, I'd like to reflect on this aspect now, and invite you, the reader, to contribute your opinions on other aspects of mentoring.

What is the role of our stories? For the listener, there may be much to learn. Hearing about experiences similar to my own help me understand that I am not an oddity and that my experiences are part of a pattern. Other stories may be cautionary tales about hurdles I have not yet encountered. From the experiences of women of previous generations, I learn that my path has been significantly easier!

For the story-teller, there are also benefits. In framing my story, I need to think about the context of my experience — it occurred at what stage in my career, who was involved, how did I behave? Thinking over my experiences, I see certain patterns: Do my listeners see them too? Do the same patterns occur in others' stories?

I am fascinated by our interest in hearing others' stories and the urge to tell our own. In feedback from various AWM mentoring programs, we hear that younger women enjoy hearing about others' experiences and are inspired by their successes. Can you think of an example where a story helped you deal with a difficult situation? Has someone's success story inspired you to keep trying? Has telling your story helped to put your experiences in context? We welcome your responses.

Mentoring Conference Notes and Tips

A mentoring conference for recipients of the Presidential Award of Excellence in Science, Math, and Engineering Mentoring was held at Duke University, November 16–17, 1998. I represented my department at the University of Nebraska which had received a 1998 award (see November–December 1998 *Newsletter*). This conference, which addressed mentoring at all educational levels of underrepresented populations, specifically women, minorities and disabled persons, was attended by many impressive, dedicated people. The stories of their successes were awe-inspiring, fascinating and sometimes surprising and humorous. Fortunately a conference proceedings will be published. The group will continue to work together to build a base of information and resources, and a web site will be established where more information about mentoring and funding can be found.

Two extremely competent and efficient female administrators, Nannerl Keohane, President of Duke University, and Mary Anne Fox, a chemist and Chancellor of North Carolina State University, gave keynote speeches. Keohane remarked on the excitement of the fields represented and on the wealth of personal talent and experience of the assembled groups. Fox mentioned a great little book of advice and examples, *Adviser, teacher, role model, friend: On being a mentor to students in science and engineering* by the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine (1997), which can be ordered from the National Academy Press, 2101 Constitution Ave NW, Washington DC 20418.

According to Oliver McGee, a Senior Policy Analyst at the White House on leave from Georgia Tech, mentors are "teachers, counselors, parents,

Gail Ratcliff, University of Missouri, St. Louis

Sylvia Wiegand, University of Nebraska, Lincoln

visionaries, inspirers, and beacons of hope and aspiration." President Clinton has directed the National Science and Technology policy group to work to increase diversity because "diversity improves quality." Instead of giving violent and competitive images, McGee says, "show images of love in mathematics." Mathematics and science are not abstractions but are important tools for understanding society. Young people need to discover and create science and technology, not learn rote. Let them be innovative and share the joy of discovery. Ask them questions. The valuable questions are driven not by facts but by concepts. The treasure is in the question, not the answer.

The lively presentation of Howard Adams, of the GEM mentoring institute and Georgia Tech, included warm personal anecdotes to show how his mentors (sometimes "tor"mentors) had befriended and guided him. The treasured key to the lab, given to Adams by his adviser, would be taken back if Adams didn't drop his weekend extra-curricular activities. Adams gives his mentees personal advice, such as: to save your marriage, don't come home tired from a conference! He identified seven types of mentoring: helping mentee shift mental context, listening when protégé has a problem, identifying protégé's feelings and providing feedback, effectively convincing protégé to confront negative behavior, providing appropriate information and/or directing protégé to resources, delegating authority or giving permission, and encouraging exploration of options. (Adams's daughter Stephanie Adams, a new engineering faculty member at Nebraska, has been assigned to be my mentee — the senior Adams has promised to send me helpful materials.)

Nina Roscher (Chair and Professor of Chemistry, American University) presented these "commandments" (from *AWIS Magazine*, July–August 1997, p. 10, credited to the Uncommon Individual Foundation, web site http://www.mentora.com/index.html). The Ten Commandments for Mentors are: 1) Thou shalt not play God; 2) Thou shalt not play mother or father; 3) Thou shalt remember that thou art a companion — not a bolt of lightning; 4) Thou shalt know that body language tells truth; 5) Active listening is golden time and thou shalt not be judgmental in your listening; 6) Thou shalt not do for someone what they can do for themselves; 7) Thou shalt not lose heart because of repeated disappointments; 8) Thou shalt be aware that some people move in straight lines, others in fuzzy curves.

Everyone is different. Thy [mentee] is not thy clone; 9) Thou shalt know thou canst move mountains — one stone at a time; and 10) Thou shalt not desire thy neighbor's success, other fields only seem greener.

Patricia Wirth, a mathematician at AT&T, says accountability is the key to getting corporate support. Corporations need a worthwhile return. Change the focus from philanthropy to investment. Also, develop a strategic plan: give a goal and assess it. Wirth emphasized that a big unified effort is needed to make major societal changes, such as the effort that got women into politics.

Susan Lasser, a counselor at Clemson University, spoke on mentoring African-American students at predominantly white institutions. A major problem for them is isolation (often from small towns, these students think nobody at a large university cares if they live or die). They can't find the other African-American students, the parties, the church, the place to get haircuts. Their parents haven't gone to college and can't tell them about courses and services offered, such as the infirmary. Many eighteen-year-olds are afraid of looking stupid and won't ask for information. Before the mentoring program started, the students who didn't quit, the survivors, generally knew someone who told them how to get along. Another problem was underpreparedness and the resulting lack of self-confidence; the counselors explained it wasn't their brains, it was their tools — if the others have buzz-saws and they have handsaws with teeth missing, they can't expect to do as well. In this program upperclassmen learned to be mentors to these students; their rules for mentoring included: keep confidences; don't be judgmental; listen, paraphrase, summarize; don't be authoritarian; give information and teach the mentee to ask for it; and ask for specifics from your mentee (do you know the names of your professors and of the smartest people in the class; do you have the books, the syllabus?).

Statistics presented at the conference show that women are better represented in science and technology than minority groups and the disabled. For example, George Campbell of NACME reported: At the B.S. level, women now receive about 40% of the mathematics degrees and a little less than 20% of the physics and engineering degrees. In computer science there was a peak in the 1980s of 33% women; now it's 20%. Minority women represent 15% of the total college-age population, but only 2.8% of the B.S. degrees, 1.9% of the M.S. degrees

and .8% of the Ph.D. degrees in science and engineering. In the history of the U.S., minorities have earned only twenty Ph.D.'s in physics; the first was in the early 70s. Recent declines in science and engineering are much greater for minority participation than for the total population.

Jaleh Daie, president and founder of Women in Science and Technology Alliance (WISTA) and a biologist at the University of Wisconsin, spoke about organizing WISTA. WISTA's vision is "a future where women's participation in science is unremarkable, natural and taken for granted"; its mission is to "create strategic alliances among diverse groups, foster women's and girls'

participation in and contribution to science, mathematics, engineering, medicine and technology."

Some key suggestions from the conference were: 1) Funding agencies, such as NSF, should support ideas that work and can be replicated, rather than always looking for innovations. 2) In order to make a real difference to an institution, mentoring must become important and systemic at that institution (and "count," be rewarded). 3) Programs for training mentors should be developed. 4) Evaluation methods for mentoring programs are needed. 5) A national clearing house for mentoring should be established (the web site mentioned above is a start towards this goal).

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Through a grant from the National Security Agency (NSA) and Coppin State University, the Association for Women in Mathematics has funds available 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.

We anticipate awarding approximately seven to nine grants of up to $3,000 each 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 in mid-February. The high school days are to be held in Spring 1999 and Fall 1999. Reports on the 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, 1999, 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 Project Advisory 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 **January 20, 1999**.

AWM IN THE 1990s: A RECENT HISTORY OF THE ASSOCIATION FOR WOMEN IN MATHEMATICS: part 1

Ever since its founding in 1971, the Association for Women in Mathematics (AWM) has been a passionate organization with a mission: to encourage women to study and to have active careers in the mathematical sciences.[1] Largely through the devotion and energy of a few overcommitted but determined individuals, especially its past presidents and officers, AWM has flourished for almost three decades. The inexhaustible enthusiasm and inspiring example of the early AWM volunteers (e.g., first founding president Mary Gray[2]) set the standard for extensive donations of time and energy by those who followed. As a result the Association has become an effective voice and vehicle for the advancement of women in the mathematical sciences.

At the outset, the initials AWM stood for the "Association of Women in Mathematics," but soon "of" was changed to "for." Men have been instrumental in the growth and prestige of AWM; about seven percent of the approximately 4500 members are male. Men give varied reasons for their membership, such as "to help me see what is available for women in mathematics and enable me to better mentor female students," or "to show support for women in mathematics." Many are motivated by a basic sense of justice and/or the belief that all of society stands to benefit from developing the mathematical talents of women. As one member explains, "If any group is subjected to willful or accidental discrimination, all of society is the victim [because society is deprived of the talents and potential accomplishments of that group]."

To commemorate the twentieth anniversary of AWM, Lenore Blum wrote an exuberant article for the *Notices* in which she described how AWM grew from a small shaky beginning in 1971 when women were "invisible" — jobs were scarce for women as were positions on the programs of meetings and conferences — to 1991, when, according to Carol Wood, women were "everywhere dense."[3] Blum's article recorded the dramatic improvements in the situation for women since 1971 and described the activities of AWM which contributed to these improvements. By 1991 the Association was a widely-respected organization with a large influence internationally; AWM had a professional newsletter, an extensive program at AMS-MAA Joint Meetings, and various projects for encouraging younger women to study mathematics. As AWM nears the end of its third decade, it is an opportune time to update that article.

A major source for this article is the last decade of newsletters of the Association (referenced in abbreviated fashion, for example, "[JF93]" signifies the January-February 1993 issue). Former AWM presidents and other AWM friends contributed information and verification. AWM member Elizabeth Allman conducted and transcribed interviews with several younger mathematicians. The choice of what to include, however, was that of the authors, and the opinions expressed here are those of the authors and do not necessarily represent AWM.[4] The authors thank Elizabeth Allman, Lenore Blum, Anthony Knapp, Eric Macris, Judith Roitman, Roger Wiegand, and the reviewers for their help with this article.

Why AWM Is Still Needed

Since Blum's article, the participation of women in the mathematical community has in general increased. The percentage of women earning Ph.D.'s in mathematics in the U.S. reached its highest level (25% overall, 29% of those granted to U.S. citizens) for the year of the latest published survey. Many more women hold entry-level positions now. Many more women speak at major meetings. In view of these improvements in the status of women in mathematics, is AWM still needed?

The answer is yes! Problems — sometimes more subtle than in the past — remain for women in mathematics at all levels. For example, the high point in the percentage of women receiving Ph.D.'s in mathematics cited above masks the fact for the rest of the decade, that percentage varied

considerably about a mean several percentage points lower; furthermore, the percentage of women entering graduate study has recently dropped at several institutions, as noted below. In spite of the description from Blum's article of women's participation in mathematics as "everywhere dense," sometimes it is "measure epsilon"; one young woman commented, "I was the most senior woman at the conference I just attended ... and I was the only woman from the U.S. None of the twenty-plus speakers were women." As the data below indicate, the prediction at the end of Blum's article — that there would be significant numbers of tenured women in the U.S. top ten departments within five years — has not been realized. Although there is a welcome increase in numbers of new women mathematicians with academic positions, women are still scarce among tenured and full professors at most institutions, particularly those in the U.S. top ten. There remains evidence of discouragement, disparities and lower expectations for women in mathematics at various levels, as the following snapshots reveal.

Social Unacceptability

Young women in high school and college still hear that "math isn't cool for women." Girls at a high school math camp for girls at Nebraska said they "could not" tell their peers that they were going to a math camp; it would be "socially unacceptable." Some high school guidance counselors still steer girls away from mathematics.

Teaching vs. Research

Many undergraduate women mathematics majors plan to become elementary and secondary teachers. Teaching is a rewarding and valuable occupation which both men and women should be encouraged to pursue. But sometimes even women who think their contribution would be greater or their life more rewarding with a research career are pressured to choose a career in teaching; this happens far more often for women than for men. Mathematically talented undergraduate women should be permitted to develop their talents and to pursue the career that suits them best.

Promotions and Rewards

Although entry-level job opportunities for men and women now seem equal,[5] women are neither promoted nor rewarded as often as men. Generally women are more numerous at the lowest levels of mathematical activity. AWM past-president Chuu-Lian Terng reported that in 1995 women in the U.S. earned 45% of the undergraduate degrees in mathematics and 23% of the Ph.D.'s, but constituted only 6% of all tenured faculty. That is, of the 4500 tenured faculty in 170 Ph.D. granting departments, only 274 were women, or 1.6 per department [JF96]. Currently published data show that 63 out of 1231, or 5%, of tenured doctoral full-time math faculty at Group I public institutions are female; for Group I private institutions, the numbers are 22/506, or 4.3%; and for Groups I, II, and III combined, 305/4714, or 6.5%.[6] This represents a welcome increase of 31 tenured female faculty in the combined groups, but the ratio of the increase in tenured women to the total increase in tenured faculty is still only 31/214. By contrast, the numbers of part-time faculty for groups I, II, and III combined are 347 female out of 941 total, or 37%.

An AWM panelist in January 1995 on the topic "AWM: Why Do We Need It Now?" Susan Landau located 65 of the 80 people awarded MIT Ph.D.'s during 1980–84. Of these 65, 13 were women (plus one of the 15 she could not locate). She reported that 14 of the men were tenured at Group I institutions, but only one of the women; 25 of the men were tenured at Group I, II, or III institutions but only two women, and overall 39 (out of 52) of the men had tenure, but only seven (out of 13) of the women [MA95].

At the beginning of this decade there was roughly a 20% discrepancy between salaries for men and women in the mathematical sciences in the U.S.[7] (See Table 1.)

| | 1990 Salaries for Ph.D.'s | |
	Men	Women
Science & Engineering	$54.5K	$44.4K
Mathematics	52.4K	43.8K
Statistics	51.7K	48.3K
Comp. Sci./Inf. Sci	60.1K	50.0K

Table 1. Salary data from Science, "Women in math update," Vol. 257, July 1992, p. 323, as reported in [ND91].

Percentages at Elite Institutions

The percentages of women in mathematics departments at the elite institutions remain dismal, with a few bright spots. In 1991–1992 there were

five tenured women total in all of the Top Ten Departments (National Academy of Sciences ranking), versus 288 tenured men, and a total of 27 untenured women versus 192 men [JF93]. There were no women at Caltech, and no tenured women at the University of Chicago, MIT, Princeton, Stanford, or Yale. (See Table 2.) Since then there have been notable changes at two institutions: Princeton University now has two tenured women and the University of Michigan has four; MIT has more untenured women. Still the total number of women is small. (See Table 3.)

Department	Tenured		Untenured		Tenure-track[8]	
	Total	Female	Total	Female	Total	Female
UC-Berkeley	60	2*	12	3	2	0
Caltech	13	0	6	0	1	0
Chicago	25	0	24	2	6	0
Columbia	14	1**	12	0	0	0
Harvard	17	1	14	3	1	0
MIT	40	0	38	4	12	1
Michigan	49	1	38	6	3	1
Princeton	31	0	28	7	22	5
Stanford	23	0	9	1	2	0
Yale	16	0	11	1	3	0
Total	288	5	192	27	52	7

Table 2: Women in Mathematics, 1991-1992[9]

Department	Tenured		Untenured		Tenure-track	
	Total	Female	Total	Female	Total	Female
UC-Berkeley	60	2	12	3	2	0
Caltech	12	0	3	0	3	0
Chicago	31	0	24	3	8	0
Columbia	17	1**	13	2	0	0
Harvard	16	0	14	2	0	0
MIT	36	0	40	10	12	4
Michigan	58	4	44	9	1	0
Princeton	23	2	20	3	14	1
Stanford	22	0	9	1	2	1
Yale	15	0	8	0	1	0
Total	288	9	183	31	42	6

Table 3: Women in Mathematics, 1998-1999[10]

Graduate School and Tenured Faculty Attrition

Proportionately more women still drop out of graduate school than men. Furthermore, anecdotal evidence suggests that in some areas where the participation of women once increased there may now be decreases. Although the percentage of women entering graduate school in mathematics has increased to 50% in some schools, at others it has decreased; in particular, at the top ten institutions it decreased considerably in 1997/1998, according to data compiled by Joan Birman [ND97]. Some universities, such as Northeastern and Rutgers, also have markedly fewer tenured women in mathematics now than twenty years ago.

Disparaging Comments and Discrimination

It may seem that outstanding new women Ph.D.'s who obtain jobs at top institutions no longer encounter any discrimination, but at least some of these women notice differences in their treatment from that of men. They report that male students and even colleagues accuse them of getting jobs, awards, and attention just because they are women. Some female students, perhaps expecting perfection when they finally see a role model, are also quite critical of women faculty. As for women who are not in top positions, they feel their faults are magnified and they are disparaged far more than comparable men.

As Mel Rothenberg observed: "Thirty years ago discrimination against women was rampant and open. More than one distinguished colleague vowed never to accept a woman as a student. Now discrimination is not open, if only out of fear of legal action. At the same time I wonder how much better it is for women. The top five research departments have literally less than a handful of tenured women.... There is no doubt that there exists an environment and attitude at our leading mathematical institutions that many women find hostile and alienating ... this environment is deeply discouraging to women graduate students and is a significant factor in limiting their careers.... We can and should regard the absence of women in our ranks as a weakness and take appropriate action" [ND93].

For these and other reasons AWM is still needed. Rather than emphasize negatives, however, this article focuses on the accomplishments and the spirit of AWM. Although there may be some cathartic value gained by comparing notes and consoling each other, most of us prefer not to dwell on discouragements, but rather to appreciate where we have come and to dream of more success, for ourselves and for society as a whole. AWM programs have been enormously helpful to younger women in mathematics; as Cheryl Grood says, "AWM helped bring me into the mathematical community at each different stage and level in my mathematical

career." Those interviewed for this article describe their experiences with AWM as "exciting and inspiring."

AWM's Activity list for the 1990s

During the 1990s, AWM has continued many of its earlier activities described in Blum's article, and it has expanded into new areas. A great deal of the work of AWM on these activities has been done by unpaid volunteers, notably Meetings Coordinator Bettye Anne Case, Newsletter Editor Anne Leggett, the AWM presidents and treasurers (who are involved in every AWM project), and members of the various committees. Case and Leggett, energetic dedicated women who have served AWM in their posts for 23 and 21 years respectively, have made enormous contributions to the continuation, the memory, the shape and the dream of AWM.

Newsletter

Under the direction of Newsletter Editor Anne Leggett, AWM publishes its bimonthly *Newsletter*. This publication regularly features informative articles about women in science and mathematics, reports of AWM events and other mathematical events, listings of jobs, both academic and non-academic, short blurbs about members, women in mathematics, news and upcoming events, an informal President's Report, an Education Column, and book reviews. The *Newsletter*, widely read and enjoyed by the mathematics community, is praised for its interesting and valuable information and articles. Women members say each *Newsletter* "recharges" them and helps them fight feelings of isolation.

Website

In 1998 AWM established, through the efforts of volunteers Tamara Kolda and Barbara Ling, an award-winning website, http://www.awm-math.org. The website was the "Pick of the Month" of the Association for Women in Computing (AWC) for June, 1998. It features announcements of upcoming deadlines and events, articles (including an expanded version of this one), pictures from previous events, some of the AWM publications listed below, links to many resources on women in mathematics, information on applying for all programs

AWM 20th anniversary celebration, January 17, 1991. Jill Mesirov, 1989–1991 AWM president (left in photo) recognizes Bettye Anne Case, AWM Meetings Coordinator, for "Outstanding Service to the Association."

AWM runs, information on ordering all its publications, and other important information.

Started in 1994 by Dianne O'Leary, AWM also sponsors AWM-Net, an electronic mail forum for AWM members, for discussing issues and publicizing events related to the AWM mission. Information on joining the AWM-Net is available at the AWM website and on page four of the *Newsletter*.

Publications

AWM has produced these publications: *Profiles of Women in Mathematics: The Emmy Noether Lecturers*, a career booklet *Careers that Count* (produced in 1992) and an older *Careers for Women in Mathematics* booklet [ND86], a *Directory of Women in the Mathematical Sciences*, membership directories, an AWM membership brochure, and an extensive report from the 1997 SIAM workshop.[11]

AWM Workshops

Begun in 1991 under the direction of AWM president Jill Mesirov, the AWM Workshops highlight the achievements of outstanding new female mathematicians via talks by recent Ph.D.'s and
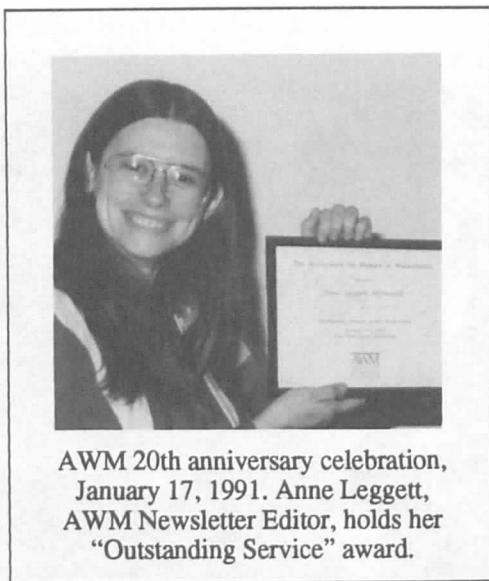
AWM 20th anniversary celebration, January 17, 1991. Anne Leggett, AWM Newsletter Editor, holds her "Outstanding Service" award.

posters presented by graduate students. Currently funded by the National Science Foundation (NSF) and the Office of Naval Research (ONR), the Workshops have continued each winter at the Joint Meetings and each summer at the SIAM meeting and are attended by both men and women. In the course of the Workshops the new mathematicians are matched with mentors, established mathematicians who give career advice. Workshop organizers also arrange various sessions offering advice for new Ph.D.'s on pressing issues. For example the summer 1997 workshop featured a minisymposium on how to write mathematics and grant proposals [ND97]. At the January 1995 panel discussion, titled "Launching a Career," Dusa McDuff discussed her career path briefly and emphasized making mathematical connections [MA95]. Catherine Roberts described the importance of finding mentors and listed nine practical suggestions for new faculty members [MA95]. Most workshops have included information on applying for various types of funding, as this is essential for new Ph.D.'s; Deborah Lockhart (NSF) has been a frequent and faithful presenter on this topic since 1992. Other workshop panel discussions have included: getting started doing research without an advisor, mathematicians in government, presentations by undergraduate students from Mills College on the Summer Program for Women, graduate education, career experiences, and balancing career and family.

New mathematicians find the Workshops valuable "for networking with each other, for discussing career difficulties, and for being inspired seeing so many women doing such excellent mathematics." They appreciate the opportunity to meet successful senior women researchers, and they especially appreciate comments and suggestions from other mathematicians about their work. A workshop participant in 1995, Helen Moore reported: "every time I talked math with someone, I gained information or insight which advanced my work ... every time I went to an AWM-sponsored event or talked with other women, I gained energy and made plans.... And aren't these two areas [our careers and our personal lives] the ones in which the AWM strives to make a difference for women?" [MA95].

Footnotes

1. More generally, AWM promotes equal opportunity and equal treatment for women and other underrepresented groups in mathematics. In this article "mathematical sciences" is often abbreviated as "mathematics."

2. At the 1991 January Joint Meetings Mary Gray was honored with a special citation: "It is especially fitting that Mary Gray be honored at the Twentieth Anniversary meeting of AWM, since she is the one person most responsible for the existence of this organization; for years her name was virtually synonymous with AWM." [MA91]

3. AMS *Notices*, September 1991, Volume 38, Number 7, pages 738-774; the article was also printed in [ND91] and [JF92] and it is accessible through the AWM web site: http://www.awm-math.org.

4. A longer version of this article is posted on the AWM web site, http://www.awm-math.org, with an opportunity for people to comment; Elizabeth Allman will moderate the discussion.

5. Marie A. Vitulli and Mary E. Flahive, *Notices* 44, No 3, March 1997.

6. *Notices*, October 1998, p. 1167

7. The authors have been unable to locate current data.

8. Positions that could lead to tenure.

9. In this table from [JF93], "*" denotes "one was a joint appointment with UCLA," "**" denotes "tenured at Barnard" and "Untenured" includes all full-time members of a department who do not have tenure — both tenure-track and non-tenure-track positions. "Tenure-track," a subset of the untenured group, includes members of a department with appointments at the end of which the member must automatically be considered for tenure.

10. This information was obtained from the departments by the authors. Again, "**" means "tenured at Barnard."

11. This report, which was the center twelve pages of [ND97], is also available separately.

— to be continued —

EDUCATION COLUMN

Last September, while visiting the Freudenthal Institute in the Netherlands, I noticed on a colleague's desk a book entitled *VrouWiskundig*, which translates roughly to *Mathematical Woman*. Intrigued, I inaugurated a line of inquiry which led me eventually to the organization *Vrouwen en Exacte Vakken* (otherwise known as VeEx) which is very much the Dutch equivalent of AWM, and whose motivations and philosophy resonate to a huge degree with ours. Fired up by this discovery, in combination with my overall pleasure in building community, I decided on the spot that this month's column would be about VeEx and AWM and what we have in common and what we can learn from each other. When my own copy of *VrouWiskundig* finally made its way across the Atlantic, I eagerly dived in, with that comparison in mind. But partway through I was so much struck by an article by Francis Meester with the title of "For Math, you have to go to your Dad" and how it fitted with my own observations and experiences that my plans were completely derailed. Generalizations are going to have to wait. Herewith the most relevant parts of the article, which I have translated somewhat casually, and after it the reasons that I think we all need to heed its message.

My mother knew nothing of mathematics. Or so she said. She had finished a school program, and had helped in her parents' cigar store, and undoubtedly learned some calculations for that, but she never liked them. When her children got good grades for arithmetic and later for mathematics, she always referred to my father: "That knack for mathematics you got from him. I have never had or understood anything about mathematics!" And my father could indeed hold his own in the field. Our memory is that he was always busy with the "Brainbuster" from the *Catholic Illustrated*, and he was enthusiastic and proud when after hours of puzzling and probably a good "problem-solving attitude" he found a solution. He also taught us arithmetic. By the time I first went to school, I could line up any two numbers less than a thousand and multiply them. He played little games with us — letter games and strategies for finding the unknown letters; he taught us canasta when we were five years old, and later bridge. So calculation and mathematics were things we learned from Dad. But yet ...

by Column Editor Ginger Warfield, Department of Mathematics, University of Washington, Seattle, WA 98195; warfield@math.washington.edu

Looking back I think — and my three sisters with me — that we learned a tremendous amount from my mother, well within the area of problem-solving but directed towards practicalities. My mother knew nothing of mathematics, but now — after so many years — I understand how many mathematical methods she wielded to keep her head above water. To run a household with six children and a very, very tight budget you've got to carry out some mathematical activities, whether or not you call them that. In what follows, I'll try to make that clear.

In addition to her inevitable reckoning and worrisome weighing of what was and wasn't possible, behind a large number of decisions there lay a well-thought-out strategy. How many nights she must have lain awake thinking up all those little plans. Every plan she brought to light was fully thought out; all "yes, but ..."s were taken into account in the plan, and the final conclusion of my father or of any of the children was always "Do it!" For the person concerned, this could sometimes be a rather annoying experience. For one's own input there was little or no place. I had the same experience later, when I was confronted with mathematical end-products. The whole thing was right, you could follow the reasoning, but there was no room for your own creative thinking.

My mother taught us among other things the following mathematical activities:

- how with limited means you could still put a balanced and tasty meal on the table

- how to make best use of the different special offers of the stores. It was a bit of extra work, but it paid off. (optimization process)

- how to acquire your school books and materials as advantageously as possible

- how you can learn to paint and paper walls, even if you have never done it before (surface translations and especially self-confidence)

- how to cut out spare rubber soles the right size for our shoes and glue them under our shoes (surfaces and symmetry)

- pattern drawing; figuring them out, reading the pattern and cutting the fabric. This last is a story unto itself. The key element was that you can always get by with a half meter less fabric than the pattern calls for. Thereby endless puzzling. We turned the pattern pieces round and round, figuring what to do about the thread direction of the fabric,

about the fold, about the pattern. Sometimes the pattern pieces had to be connected and we opted for invisible seams. Circular skirts were cut out in strips, but so that the pattern carried through reasonably well. The most stressful were the striped materials: diagonal stripes above and vertical lengths. With awe we watched how it (almost) always came out right. (all sorts of geometrical activities)

• how to follow the directions once the pattern was cut out. Some things you can skip or switch the order of, but others — like putting on a collar or lapel — have to be done in the exact order specified. (Some processes are commutative, others not.)

• calculating she most certainly could do! I have only to think of the complex reckoning she carried out in order to figure out just how much curtain material was needed, allowing for pleats and matching up the pattern at the seams. For me she is now an example of someone who can carry out computations just fine provided they occur in an attractive context.

• another example: find out how much carpeting is needed for a bedroom. There was a special on 200 centimeter wide carpeting. We puzzled endlessly (mother and some of her daughters) over the most efficient way to cover the floor of the little brothers' bedroom.

• she showed us how to make a straight carpet runner go around a curve in the stairway by putting folds in just the right places. And after a number of years, when the carpet began to wear, she managed to pull out the pieces of carpet that had been inside the folds and put the worn pieces into new folds.

• knitting was clearly in a whole different category from sewing for her. The liberties she felt free to take with sewing she absolutely would not take with a knitting pattern. She was very secure with the reading of a knitting pattern. She knew that if you got sloppy you could make horrendous mistakes. Knitting and crocheting patterns can be pretty complicated to read, but for a practiced reader they pose no problems.

But in knitting her daughters quickly outstripped her. In elementary school we learned to knit — baby socks, baby jackets — and to crochet — pot holders! — and along with that we acquired some faith in our reckoning and knitting capacities. We caught on swiftly to the fact that you could choose a sweater pattern that you liked, find some pretty wool, without paying attention to its thickness, and get to work. By way of a trial square, the stitch count, the needle count, the centimeter count you could figure everything out for the pattern you wanted (proportional reasoning). Later I realized that a knitting pattern is exactly like a computer program in (for example) Basic. You give it a name, there are abbreviations, procedures, a start, a repeat command, until …, go to …, and an end.

• technology is not for women? My mother had the technique for maintaining her sewing machine down cold. She greased it regularly and turned the tension regulator or the thread holder to accommodate changes of material or thread. A little parenthetical question: how many men can adjust the thread tension on a sewing machine? technology is not for men?

I can only remember my mother making one mathematical mistake. She wanted to put a new carpet in the upstairs lavatory. Yes, you guessed it. She made an impeccable pattern of the lavatory floor from newspaper, with a hole for the toilet cut out of it, laid the pattern on the bottom side of the rug, cut it out with a sharp carpet knife and tried to put it on the floor. Alas, the cutout for the toilet was on the left side instead of the right. Hilarity in the whole family, including mother, and with a bit of shame, but more sorrow: "Too bad about the rug." She turned the cut up rug into a floor covering for the kitchen cabinets and the upstairs lavatory retained its old rug for at least a year. We comforted each other with "that kind of thing happens — it happens to you once and then never again." Sometimes she got annoyed, when kids or husband teased her about it: "Sure, if you never do anything you never make mistakes! At least I tried something — can't I ever have anything go wrong?" Then we comforted her and nodded: "It could have happened to us, too!"

"For math, you have to go to your Dad," she would answer almost before a question was out of our mouths. Did I learn math from my father or from my mother? From both! From my father I acquired self-confidence on the subject of arithmetic before I set foot in elementary school. Probably also something of a problem-solving attitude for theoretical problems, and in any case the awareness that it often takes a lot of time, and you have to keep on trying. But I also saw in my father a lot of fear of failure on practical matters. He had genuine

fear of failure about trying something new. He avoided it, but it wasn't because he looked down on that kind of work, or to protect himself — for years he did all manner of boring household tasks to make my mother's job lighter. When he saw his wife busy with new practical tasks he would say, laughing and with a mixture of shame and pride: "I just plain have two left hands," and with this announcement evade any new practical undertaking. Now, years later, I regularly hear students, especially girls, say the same thing " I just plain can't do any mathematics" and thereby arrange never to take the first steps to begin it..

From my mother I acquired a determination to try hard, and not to let myself be defeated. At school I had two sisters as examples before me, and as an encouragement to believe that I, too, had acquired the knack for mathematics. What knack? My mother knew what was what! When members of our family saw our report cards and said it was great to be able to learn so well, it was my mother who came through with "They also work hard for it — they spend a lot of time upstairs studying." She connected the good results with a capacity that you could develop by your own efforts. A level-headed, practical and healthy point of view about learning, it seems to me.

Now, after many years, I realize how many mathematical activities we learned around the house from our mother. I'm just now noticing that, because it is just now that I recognize the mathematics there. *Mathematics is not only mathematics when it is labeled mathematics!*

Mathematical thinking is the power of zooming in and zooming out, working locally or globally, with the concrete or the abstract, the process of mathematization; for me, the mathematics of my father and the mathematics of my mother.

Self-confidence on the practical terrain and fear of failure on the abstract terrain I learned from my mother; self-confidence on the abstract terrain and fear of failure on the practical terrain I learned from my father. What came out of that? A person with certainties and uncertainties on the practical and abstract terrains, but now especially a person astonished that for so many years the image of mathematics for me was the mathematics of my father.

Fortunately I know better now.

Is this a women's issue? Yes, of course, and a crucial one. But as the article has continued to rattle around in my head, I have become increasingly convinced that it is in fact an issue for every mathematician. How often are we all informed, "Oh, math! I just plain can't do any of that stuff!" and how consistently do we mentally roll up our eyes and start discussing the weather? Maybe it's time we stopped doing that. Maybe we need to start coming back with "But I thought you knitted that sweater?" or "Then how did you figure out how much time to allow for your drive to Kalamazoo?" Certainly a high proportion of the people claiming "I just can't do math" are women. But the image of mathematics as a batch of high, dry abstractions is pervasive among both genders, and the damage that image does is quite remarkably widespread. So perhaps it's up to us all to begin to chip away at it, one self-denigrator at a time!

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**.

For more information, phone 301-405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

BOOK REVIEW

Charlene Morrow and Teri Perl, editors, **Notable Women in Mathematics: A Biographical Dictionary**, Greenwood Press, Westport CT 1998. xv+302. ISBN 0-313-29131-4 (cloth), $49.95.

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

Here at my home institution, Virginia Tech, I regularly teach our one-semester upper-level course in the history of mathematics, which is taken primarily by seniors majoring in mathematics or mathematics education. It's quite a challenge to present — in fourteen weeks — an overview of the high points of the historical development of mathematics, while at the same time conveying a sense of the social, cultural, intellectual, and political foundations of the subject. It is a still greater challenge to describe the explosive growth of mathematics, and of the mathematical community, over the past hundred years or so.

But perhaps the greatest challenge that I face, as a woman teaching a roughly equal mix of male and female students, is to explain the stunning absence of women from the story of mathematics — and, in particular, the yawning gap between the death of Hypatia (in the early 5th century A.D.) and the appearance of talented amateur mathematicians such as Emilie du Chatelet and Maria Agnesi (in the early 18th century). Why were women absent from mathematical activity for so long, and what were the social and cultural conditions which facilitated their reappearance? How can I convey to my students the truly stunning transformation over the past 125 years, during which time women have become significant, indeed central, participants in the mathematical enterprise?

It is difficult to address these complex issues in a one-semester class, but many of my students choose to explore them further in research papers that they write throughout the semester. Every year, growing numbers of my female students — though, regrettably, none of their male classmates — express interest in researching and writing about the lives of women in mathematics. The volume under review, *Notable Women in Mathematics*, edited by Morrow and Perl, provides a helpful starting point for those students eager to know more about the contributions of women — particularly contemporary women — to mathematical research and education.

Notable Women in Mathematics is a collection of fifty-nine short biographies of women mathematicians. According to the book jacket blurb, the book is "designed for secondary school students and the general public." Reading through the individual biographical essays, however, the level of discussion seems more appropriate to the students in my history of mathematics course. The profiles seem to address the questions that a young woman completing an undergraduate major in mathematics might have about her future place in the mathematical community: whether to go on to graduate school; how to combine career and family life; whether to concentrate upon research or upon teaching. The profiles tend to downplay the more technical aspects of mathematical research, but do seem to require at least a modicum of "mathematical maturity" on the part of the reader.

The current volume invites comparison to a 1987 Greenwood Press publication (still in print), *Women of Mathematics: A Biobibliographic Sourcebook*, edited by Louise Grinstein and Paul Campbell. The Grinstein-Campbell volume is a much more *historically* oriented work, profiling those women who have had a lasting impact upon mathematics and the mathematical community, emphasizing the contributions of women to research mathematics and providing extensive bibliographic references. By contrast, Morrow and Perl endeavor to show the great *variety* of women involved in the mathematical enterprise. While their book includes biographies of many of the early pioneers (Hypatia, du Chatelet, Germain, Lovelace, Kovalevskaya), well over half of the women profiled here were born after 1920, the majority of these after 1940.

This emphasis on contemporary mathematicians leads to some puzzling omissions. For example, the book includes a profile of Christine Ladd-Franklin, the first woman to complete all the requirements for the Ph.D. in mathematics at an American university. Ladd-Franklin was admitted to graduate study at Johns Hopkins in 1878 and had completed all the requirements for the Ph.D. by 1882, but Hopkins refused to award her the degree until 1926. However, the book does *not* include a profile of Winifred Edgerton Merrill, who in 1886 became the first woman to receive a mathematics Ph.D. from an American institution. While the book includes the British-born and educated Charlotte Angas Scott, founding head of the mathematics department at Bryn Mawr College, it omits her illustrious and

influential successor, Anna Pell Wheeler. In fact, Morrow and Perl overlook all but four — Pauline Sperry, Mina Rees, Grace Hopper, and Ladd-Franklin — of the well over 200 American women who earned Ph.D.'s in mathematics prior to 1940.

The book includes the first three African-American women to earn Ph.D.'s in mathematics — Evelyn Granville, Marjorie Lee Browne, and Gloria Hewitt — along with Vivian Malone-Mayes, the first Black faculty member at Baylor University in Houston. Although the jacket blurb says that the book includes profiles of Latina mathematicians, these do not seem to be greatly in evidence; Cora Sadosky, born in Argentina, seems to be the only woman included who is of Latin American descent. An effort is made to include Asian, European, and Australian women as well, but the vast majority of these women has lived and worked in the United States at one time or another. Because nearly all of the contributors are from the United States, the biographical profiles are clearly filtered through an American lens.

Morrow and Perl include among their subjects some of the most distinguished women in American mathematics since 1950. They include Julia Robinson and Cathleen Morawetz, the first two women to be elected to the mathematics section of the National Academy of Sciences and the first two women to serve as President of the American Mathematical Society; Karen Uhlenbeck and Nancy Kopell, both of whom have won prestigious MacArthur Foundation fellowships. They also include scholars in the field of gender studies in mathematics education (Elizabeth Fennema and Gilah Leder) and at least one historian of mathematics (Karen Parshall). Also included are brief biographies of the founders and presidents of the AWM, and of many (but not all) of the AWM Noether Lecturers.

Naturally enough, in a book of this size and scope there are a few editorial oversights and errors. For example, Mina Rees died in October 1997 while this book was going to press; her death is, as a consequence, not noted. The profile of Hypatia which is included in this volume fails to make reference to some of the recent scholarship on her life and work, most notably that of Maria Dzielska and Michael A.B. Deakin (see my review in the May–June 1996 issue of this *Newsletter*). Since this work is easily accessible to undergraduate students in mathematics, it would have been nice to have seen it mentioned.

In addition, it would have been nice to see some mention of those women who, while trained in mathematics, have made significant contributions to statistics. I, for one, would have enjoyed reading profiles of Gertrude Cox, Elizabeth Scott, and Florence Nightingale David. Finally, in a volume that strives for diversity as well as insight into the personal lives of women in mathematics, it would have been nice to know more about how individual women actually dealt with conflicts between career and family life, and about those women who — whether by choice or by chance — did not marry

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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.**

For more information, phone 301-405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

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and have children. What are the advantages and disadvantages faced by women who lead non-traditional lifestyles? (For more on this issue, see Mary Beth Ruskai's excellent article, "Myths about the role of marital status ..." in the May–June 1994 issue of this *Newsletter*).

Despite these shortcomings, *Notable Women of Mathematics* is a valuable resource for students and mathematics educators alike. It provides valuable insight into the variety of ways in which women — especially contemporary women in the United States — have created a niche for themselves in the world of mathematics.

CHAIRS MEETING

At the meeting for Chairs of Mathematics and Statistics Departments in the United States and Canada held in Washington, DC on November 14, 1998, AWM President-elect Jean Taylor organized a panel, "Useful Resources for Women." Panelists included Jean, Cheryl Grood (Swarthmore), Denise Caldwell (NSF), and AWM President Sylvia Wiegand (Nebraska). The audience members were genuinely interested in resources for their women students and faculty, and they themselves made some excellent suggestions and comments which fueled the discussion.

Jean opened the session by describing the various activities and programs sponsored by AWM. She admirably handled the tough job of condensing this information into a mere three overheads and fifteen minutes! (More extensive details about AWM-sponsored programs can be found at http://www.awm-math.org.) Of particular interest to the audience were the Sonia Kovalesky Days. Although AWM has the funds to sponsor only a limited number of institutions, members of the audience pointed out that they might be able to finance an SK Day without funding from AWM.

Next, Cheryl spoke about starting a chapter of the Noetherian Ring, based on her experience at the University of Wisconsin. She noted how Richard Brualdi, the University of Wisconsin mathematics department chair, supported the group both by earmarking some funds for the group to host speakers

Cheryl Grood, Swarthmore College

and also by encouraging the faculty to invite more women colloquium speakers to campus. While such groups at Wisconsin, Berkeley, and elsewhere have been successful, Cheryl cautioned that it can be difficult for graduate students to find the time and energy to organize such a group. In response, Sylvia suggested that the department itself could get involved by scheduling a time for the women faculty and graduate students to have lunch with visiting women colloquium speakers. Denise then spoke on the POWRE grants and illuminated some of the differences between these new grants and the former VPW grants. Sylvia was the panel's "clean-up hitter," speaking primarily about the mentoring of graduate students in her department (see the November–December 1998 *Newsletter*).

A lively conversation continued informally over lunch. Two topics of discussion showed the continued need for resources for women: the paucity of women department chairs (both at the conference and in general), and the fact that a recent NPR story about how math has become trendy (see http://www.npr.org/ programs/ atc/ archives/ 1998/ 981109. atc. html) made no mention of women in mathematics — it might have more properly been titled, "Math is Cool, if You're a Man."

NOTABLE AMERICAN WOMEN

Radcliffe College and the Harvard University Press announce the next volume of *Notable American Women: A Biographical Dictionary*, scheduled to appear in 2003. Volume V will include essays on approximately 500–600 women who will have died from 1976 through 1999. Selection criteria will be: the subject's influence on her times or field; ability; innovative or pioneering work; and relevance of her career for the history of women.

If you wish to nominate a subject, please supply a short synopsis of her career and its importance, as well as basic bibliographic sources, both secondary and archival (if known). Scholars who are interested in writing specific articles or serving as consultants for specialized fields are also sought. Please address all communication to: Susan Ware, Editor Notable American Women, The Schlesinger Library, Radcliffe College, 10 Garden Street, Cambridge MA 02138; 617-495-0564; notable@radcliffe.edu.

THE OLGA TAUSSKY TODD CELEBRATION OF CAREERS IN MATHEMATICS FOR WOMEN

supported by the National Security Agency (NSA),
the Office of Naval Research (ONR),
the Mathematical Sciences Research Institute (MSRI)
and the Association for Women in Mathematics (AWM)

The Celebration is scheduled for July 16–18, 1999, at the Mathematical Sciences Research Institute in Berkeley, California. The National Security Agency will provide base support; the Mathematical Sciences Research Institute, the Office of Naval Research, other agencies and companies, and the Association for Women in Mathematics will provide added support, *pending final funding approval*.

Featured lectures will showcase the research of outstanding women in mathematics. Talks and discussions by established mathematicians with careers in government, business, industry and academia will focus on contemporary issues of concern to young women. The primary goals of the celebration are to assist, encourage, and inspire the graduate student and recent Ph.D. participants, to provide a forum for networking between mathematicians at different career stages, and to promote the achievements of women in mathematics. Senior investigators will provide role models and offer mentoring for the beginning women mathematicians. The graduate students and recent Ph.D.'s who participate will find in the legacy of Olga Taussky a realistic model and worthy goals for their lives. The scientific community is invited to talks.

TRAVEL SUPPORT, pending funding, is available for selected women graduate students and recent Ph.D.'s in the mathematical sciences. The graduate student must have begun work on her dissertation problem. Recent Ph.D.'s should be within 7 years of the degree and, if academically employed, not tenured. Previous AWM Workshop participants who are eligible are invited to apply.

Applicants should include *five* copies each (collated and stapled) of a cover letter, an outline of their research (one to two pages), and a curriculum vita. Applications should also include at least one letter of recommendation; in particular, a graduate students should include a letter of recommendation from her thesis advisor. All non-U.S. citizen applicants must have a current U.S. address. Those funded will present their work in a poster or talk and will receive reimbursement for travel cost (up to $600) and 2.5 days subsistence for meals and lodging.

Send **five** complete copies of the application materials (including the cover letter) to:

Olga Taussky Todd Celebration 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

APPLICATION DEADLINE: Applications must be received by **February 18, 1999**.

Organizers: B. Case (Chair), C. Gordon, D. O'Leary, G. Ratcliff, J. Taylor, S. Wiegand.

MORGAN PRIZE

The 1998 Frank and Brennie Morgan Prize for outstanding research by an undergraduate has been awarded to Daniel Biss for his extension of a category which more closely binds the associations between combinatorial group theory and combinatorial topology. An honorable mention has been awarded to Aaron Archer for his work introducing new chromatic interpretations for a graph.

The work submitted by all of the Morgan Prize applicants demonstrates that undergraduate students represent our future and have consistently demonstrated that they can make significant contributions to the profession.

The Frank and Brennie Morgan Prize is given each year to reward outstanding research by an undergraduate student. The deadline for applications is **June 30, 1999**. Students who were undergraduates in December 1997 are eligible for the award. One award of $1,000 is given each year, although the committee may also give honorable mentions.

A nomination for the award should include at least one research paper and at least one letter of recommendation. The research paper(s) need not have been published, but the work must have been performed while the nominee was an undergraduate student. Applications should be submitted to: Morgan Prize Committee, c/o Robert M. Fossum, Secretary, American Mathematical Society, Department of Mathematics, University of Illinois, 1409 West Green Street, Urbana IL 61801-2975.

MINISYMPOSIUM FOR WOMEN POSTDOCTORAL MATHEMATICIANS

ICIAM 99, Edinburgh, Scotland, July 5–9, 1999

supported by the National Science Foundation (NSF), the Office of
Naval Research (ONR), the Association for Women in Mathematics (AWM)
and European Women in Mathematics (EWM)

The AWM, EWM and the Society for Industrial and Applied Mathematics (SIAM) are seeking four speakers for a minisymposium for women postdoctoral researchers at the Fourth International Congress on Industrial and Applied Mathematics (ICIAM 99), July 5–9, 1999, Edinburgh, Scotland. AWM, EWM, and SIAM are joint sponsors of the symposium. The speakers will be chosen from women mathematicians working in the U.S., in Europe and throughout the world. Each speaker selected will present a 30-minute talk on her research in applied mathematics.

All applicants (doctoral degree awarded no earlier than July, 1989) should provide a curriculum vitae, a concise description of research (one to three pages) and a letter of recommendation. Funds for travel support for up to two U.S. speakers will be awarded through an NSF/ONR grant to AWM. These AWM-funded U.S. speakers must be U.S. citizens or non-U.S. citizens who are working in the U.S. Limited funding for European speakers may be available from EWM.

Send **five** complete copies of the application materials (including the cover letter) to:

AWM/EWM/SIAM Minisymposium at ICIAM 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

APPLICATION DEADLINE: Applications must be received by **February 28, 1999**.

TWO VIDEOS

The video "Women and Mathematics across Cultures" is available from the EWM office in Helsinki. The video was shown at ICM–98 in Berlin after the panel on women and mathematics. The video explores the impact of cultural differences of the female condition, allowing four women mathematicians who have studied and worked in Europe and North and South America to tell their stories. Following a five-minute introduction to EWM, including some surprising statistics about women mathematicians in Europe, the four women recount their personal experiences.

The length of the video is 25 minutes, directed by Marjatta Naatanen in collaboration with Bodil Branner, Kari Hag and Caroline Series, 1996. The cassettes are in VHS and the prices are as follows: system PAL or SECAM/NTSC, in Europe 200 FIM or 250 FIM, outside Europe 220 FIM or 270 FIM. SECAM and NTSC cassettes are not subtitled, but the video is in English and a written text of the interviews is provided. Send an order via email to Riitta.Ulmanen@helsinki.fi, including the system you want. After we receive your payment, the cassette will be mailed to you. Please, pay to *Euroopan naismatemaatikot* to the account number 800017-702454141 with Leonia Bank plc, Helsinki Finland, with swift code PSPBFIHH via ECU Netting System, or via Eurogiro. The telex of Leonia Bank is 121 698. Personal checks and credit cards cannot be accepted. Mailing address: Riitta Ulmanen, Department of Mathematics, P.O.Box 4, FIN-00014 University of Helsinki, Finland.

Marjatta Naatanen, University of Helsinki

A documentary video/film, "Solving Hilbert's Tenth Problem," in part a biography of Julia Robinson, is in the works. The first sequences of the film, showing Constance Reid (Robinson's sister and biographer) attending Yuri Matiyasevich's 50th birthday celebration in St. Petersburg, Russia, are scheduled for January 2, 1999. The producer, George Paul Csicsery, who also produced a film about Erdös, needs financial assistance to continue.

AWM past-president Lenore Blum says about the film: "The JR film project is really worthwhile. 'N is a Number: A Portrait of Paul Erdös' is an excellent film [which] appeals to mathematicians and non-mathematicians and I imagine the JR film would have a similar if not wider appeal."

The project has been accepted for fiscal sponsorship by Film Arts Foundation (FAF), a 501 (c) 3, non-profit arts organization. Contributions are tax-deductible. Checks, payable to FAF and designated Hilbert's Tenth Problem, may be sent to: Film Arts Foundation, 346 Ninth Street, Second Floor, San Francisco, CA 94104; 415-552-8760. Also, your contribution or ideas for funding may be sent to the producer: George Csicery, POB 2833, Oakland, CA 94618; phone: 510-428-9284; fax: 510-428-9273; email: 75430.3310@compuserve.com.

OPPORTUNITIES

Nebraska Conference

The University of Nebraska – Lincoln is pleased to announce the 1999 Nebraska Conference for Undergraduate Women in Mathematics celebrating our 1998 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (see November–December *Newsletter*). The award recognizes our department's success with women graduate students, and this Conference is part of our ongoing effort to continue and extend these mentoring activities.

The Conference will be held March 5–7, 1999 in Lincoln, bringing together undergraduate women mathematicians from across the country and giving those who have already done research an opportunity to present their results. The Conference will also include lectures by prominent women mathematicians, including current AWM President Sylvia Wiegand. There will be ample opportunity for the undergraduate women to meet and talk with these mathematicians.

Some funding will be available for undergraduate women to attend this conference. For more information or to request a registration form, please send email to womenws@math.unl.edu or visit http://www.math.unl.edu/~womenws. If you know an undergraduate woman mathematician who would benefit from our Conference, please encourage her to register in addition to sending us her name and address so we may contact her directly.

Judy Walker, University of Nebraska – Lincoln

Tensor Grants

The Tensor Foundation, working through the Mathematical Association of America (MAA), awards grants for projects designed to encourage college and university women or high school and middle school girls to study mathematics. Ten grants of up to $5000 each will be made to the institution of the project director; institutions are expected to supply matching funds or in-kind support. Proposals must be received by **February 5, 1999**. Applicants will be notified by the end of February 1999. For more information, contact: Bernice Kastner, MAA, 1529 Eighteenth Street, NW, Washington, DC 20036; phone: 800-741-9415; url: www.maa.org/projects/solic_99.html; email: bkastner@maa.org.

Budapest Semester in Mathematics

Hungary is a country with a long tradition of excellence in mathematical research and education. Spend a semester of your junior or senior year experiencing this tradition in the Budapest Semester in Mathematics. All courses are taught in English by eminent Hungarian scholar-teachers; classes are small and creative problem-solving is emphasized. Applications are due **April 30** for the fall semester and **November 1** for spring; early applications are encouraged and will be processed promptly. For further information, contact: Professor Paul D. Humke, North American Director, Department of Mathematics, St. Olaf College, 1520 St. Olaf Avenue, Northfield MN 55057; phone: 800-277-0434; fax: 507-646-3549; email: budapest@stolaf.edu; url: www.stolaf.edu/depts/math/budapest.

Positions with Highly Able Youth

The Johns Hopkins University Institute for the Academic Advancement of Youth provides academically talented students the opportunity to take rigorous courses in mathematics, science, computer science, humanities, and writing through its Centers for Talented Youth and for Academic Advancement. Teaching assistants and instructors are needed for summer 1999. More information may be found at http://www.jhu.edu/gifted/acadprog/jobs.html. To request an application, email your name and mailing address to dbutler@jhu.edu or call 410-516-0053. The deadline for completed applications is **January 30, 1999**.

Luce Fellowships at Saint Louis University

$25,000 graduate fellowships for women in science are available through the Clare Boothe Luce Fund for qualified individuals interested in pursuing Ph.D. degrees in biology and mathematics at Saint Louis University. Applications must be received by **February 10, 1999**. For information or application materials, contact: Saint Louis University, The Graduate School, Attention: Clare Boothe Luce Fund, 3663 Lindell Boulevard, St. Louis, MO 63108; 314-977-2240; www.slu.edu.

NSF Faculty Enhancement Workshop

"Teaching Undergraduate Geometry," a workshop to be held June 1–7, 1999 at Cornell University, is intended for college and university faculty who teach (or soon will teach) an undergraduate geometry course, such as courses designed for future or in-service teachers. The leaders of the workshop will be David Henderson (Cornell University), Kelly Gaddis (Buffalo State College), Jane-Jane Lo (Ithaca College/Cornell), and Avery Solomon (Cornell). Also, two previous participants are expected to serve as mentors to share their recent geometry teaching experiences and to provide support. Enrollment is limited; the review of applications will begin **April 1, 1999**.

In the mornings, the learning and teaching environment will be innovative in terms of both content and teaching methods. The integration of geometries on plane, sphere and other surfaces will be presented through problems which emphasize experiencing the meanings in the geometry. Student investigations, small group learning, and writing assignments will be explored.

In the afternoons, there will be seminars and presentations on topics related to the workshop theme, including: "Using Writing in Mathematics," "Using Computer Technology in Geometry," "Non-test-based Assessments," "Including All Students by Encouraging Diverse Ideas," "Curriculum Developments in School Geometry," "Student Affects and Beliefs Surrounding Innovative Programs," and "The Eight Undergraduate Geometry Courses at Cornell." In addition, there will be ample free time for informal discussions and enjoyment of the geometry of nature in and around Ithaca.

Much of room and board will be covered by the NSF for all participants. There may also be very limited NSF funds available for travel costs for

participants from institutions with limited resources. NSF will also support follow-up activities, including local workshops, exchange of related classroom materials, and communication of experiences and ideas. The workshop will begin with an evening reception at 6:30 p.m. on Tuesday June 1 and end at 4:30 p.m. on Monday, June 7, with a free day on Saturday. Housing will be provided for participants wishing to stay through Tuesday, June 8.

Bernstein Fellowship

Each year, the Department of Mathematics of the University of Haifa in Haifa, Israel awards a special fellowship to a woman pursuing graduate work in pure or applied mathematics. The fellowship is named after Dr. Dorothy Bernstein, the first woman to be elected president of the MAA and one of the first American-trained female research mathematicians of international repute.

Information about the M.A. and Ph.D. programs in mathematics at the University of Haifa may be obtained by writing to the Graduate School Advisor, Department of Mathematics, University of Haifa, 31905 Haifa, Israel or through the department's web page at http://mathcs3.haifa.ac.il/math/.

Distributed Autonomous Systems

A conference on distributed autonomous systems will be held at Santa Fe Institute, July 11–16, 1999. Distributed autonomous systems are collections of interacting entities that function without a "leader." Three biological examples of such systems, respectively molecular, cellular and community-wide, are metabolism, the immune system, and ant colonies. Other examples are found in robotics and artificial intelligence. In our view, at the operational level distributed autonomous systems are best regarded not as striving toward an overall goal but rather as responding "appropriately" to continual overlapping challenges. The systems operate in a milieu that their actions alter. Agent activities are modified by numerous feedbacks that come from sensing both the milieu and messages from other agents.

The central purpose of the proposed meeting is to air and discuss (in a "workshop" atmosphere) suggestions for principles that guide the effective operation of distributed autonomous systems, with a strong but not exclusive emphasis on the immune system. In addition to the various senior experts we wish to invite some of the brightest young students

and investigators in immunology, physics, mathematics and computer science who are interested in systemic issues.

About two-thirds of the conference will be devoted to immunological questions. To provide essential background for those unfamiliar with immunology, a three hour pre-session is planned for Sunday during which basic immunological terminology and concepts will be presented. There will be a parallel "tutorial" for biologists in relevant mathematical concepts.

For more information, contact the organizer Lee Segel at lee@wisdom.weizmann.ac.il.

COBASE Program 1999–2000

The Office for Central Europe and Eurasia of the National Research Council, the operating arm of the National Academy of Sciences, National Academy of Engineering, and Institute of medicine, offers grants to individual American specialists who plan to establish *new* research partnerships with their colleagues from Central/Eastern Europe and the Newly Independent States. This program is designed primarily to prepare these new partnerships for competition in NSF programs. Both project development and long-term grants are available. Project deadlines are **April 5, 1999** and **August 16, 1999** for project development and **July 30, 1999** for long-term grants. Contact: Office of International Affairs, National Research Council, 2010 Constitution Avenue NW, Washington, DC 20418; phone: 202-334-3680; fax: 202-334-2614; email: ocee@nas.edu; url: www2.nas.edu/oia/22da.html.

Geophysical Fluid Dynamics Fellowships

Up to ten competitive fellowships are available to support graduate student participants in the 1999 Summer Program in Geophysical Fluid Dynamics (GFD) at the Woods Hole Oceanographic Institution, June 21 to August 27. The program brings together graduate students and researchers from a variety of fields who share a common interest in nonlinear fluid dynamics. The central theme of the 1999 program is the stirring and mixing of passive and active tracers in turbulent, stratified, rotating fluids. William R. Young of the Scripps Institution of Oceanography will give an initial set of lectures. Staff members and visitors will provide further lectures and seminars on the central topic and others in GFD. For the graduate student Fellows, the

centerpiece of the summer is a research project pursued under the guidance of the staff. At the end of the summer, Fellows will present both verbal and written reports on their projects. Successful applicants will receive stipends of $3,900 and travel expenses within the United States. The application deadline is **February 16, 1999**. Awards will be announced in April. Applications from women and members of underrepresented groups are particularly encouraged. Information and applications may be obtained from: The Fellowship Committee Education Office, Clark Laboratory, MS #31, Woods Hole Oceanographic Institution, 360 Woods Hole Road, Woods Hole MA 02543-1541; phone: 508-289-2219; fax: 508-457-2188; email: education@whoi.edu; url: http://www.whoi.edu/gfd/. The Program is funded by NSF and ONR.

AAUW

The American Association of University Women Educational Foundation awards fellowships for public school teachers for programs designed to advance girls' achievement in math, science, and/or technology. The application postmark deadline is **January 15, 1999**. Also, Community Action Grants to support innovative programs to promote education and equity for women and girls are available; the deadline is **February 1, 1999**. For applications, call 319-337-1716 or visit www.aauw.org.

2000 AAAS Annual Meeting

The American Association for the Advancement of Science (AAAS) invites proposals for symposia and nominations for topical lectures for the 2000 AAAS Annual Meeting and Science Innovation Exposition to be held February 17–21, 2000 in Washington, DC. Deadlines for receipt are **March 22, 1999**. Online copies of the form are available at www.aaas.org/meetings/scope/proposal.htm.

Celebration of Women in Engineering

The National Academy of Engineering (NAE) has launched a new web site (www.nae.edu/cwe) as part of a major effort to encourage young girls and women to choose engineering as a profession. The Celebration of Women in Engineering project will conclude with a national summit on recruiting and retaining women engineers to be held May 17–18, 1999 in Washington, DC.

CONGRATULATIONS!!

Exciting late-breaking news: Cathleen Morawetz has just been awarded a National Medal for Science! See our website at www.awm-math.org for more info.
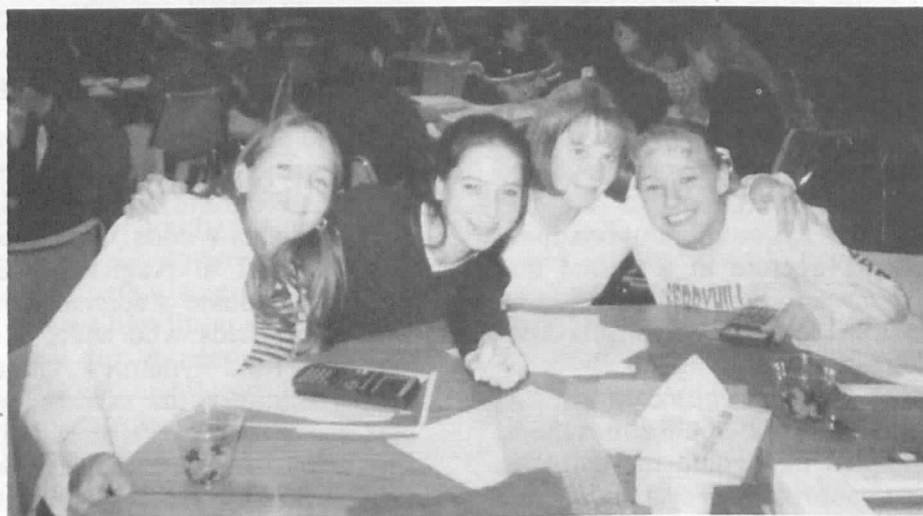
Sonia Kovalevsky High School Day at University of Tulsa

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Travel Awards — Association for Symbolic Logic
1998–99 Annual Meeting and 1999 European Summer Meeting
and the 1999 International Congress of LMPS

Travel Awards for the Annual Meeting and European Summer Meeting. The ASL will make available modest travel awards to graduate students in logic and (for the European Summer Meeting only) to recent PhDs, so that they may attend the 1998–99 ASL Annual Meeting in San Diego, California, or the 1999 ASL European Summer Meeting in Utrecht, The Netherlands; see below for information about these meetings. To be considered for a Travel award, please (1) send a letter of application, and (2) ask your thesis supervisor to send a brief recommendation letter. The application letter should be brief (one page) and should include (1) your name, (2) your home institution, (3) your thesis supervisor's name, (4) a one-paragraph description of your studies and work in logic, (5) your estimate of the travel expenses you will incur, (6) (for citizens or residents of the USA) citizenship or visa status, and (7) (voluntary) indication of your gender and minority status. Only modest awards will be possible, partially covering travel costs and perhaps some of the living expenses during the meeting. Women and members of minority groups are strongly encouraged to apply. In addition to funds provided by the ASL, this program of travel awards is supported by a grant from the US National Science Foundation; NSF funds may be awarded only to students who are either citizens or permanent residents of the USA or are at USA universities. For the 1998–99 ASL Annual Meeting, applications should be sent by the deadline of January 29, 1999 (deadline extended), to the Program Chair: Sam Buss, Department of Mathematics, University of California at San Diego, La Jolla, California 92093-0112; email: sbuss@ucsd.edu. For the 1999 ASL European Summer Meeting, applications should be sent by the deadline of April 2, 1999, to the Program Chair: Wilfrid Hodges, School of Mathematical Sciences, Queen Mary and Westfield College, Mile End Rd., London E1 4NS, England; email: w.hodges@qmw.ac.uk. For both meetings, application by email is allowed, in fact encouraged.

Travel Awards for the Eleventh International Congress of Logic, Methodology and Philosophy of Science; August 20–26, 1999; Krakow, Poland. NSF funding for these travel awards is pending. Only logicians who are contributing a paper to the Congress or are otherwise official participants are eligible. Funds may be awarded only to individuals who are either citizens or permanent residents of the USA or are at USA universities. Recent PhD recipients, women, and members of minority groups are especially encouraged to apply. Air travel must be on US flag carriers. Application must be made on a special form, which may be obtained from the ASL office; the form may also be printed out from the ASL website. Applications must be received at the ASL office by the deadline of February 1, 1999. For meeting information see the Congress web page: http://www.uj.edu.pl/Phils/congress.

The 1998–99 ASL Annual Meeting. *March 20-23, 1999, San Diego, California.* The meeting program will include the Tenth Gödel Lecture. Former ASL President M. Magidor will give a Retiring Presidential Address. There will be a Symposium on Mathematical Intuition with speakers including M. Friedman and C. Parsons. Other invited speakers include S. Friedman, J. Knight, S. Lempp, T. Pitassi, H. Schoutens, W. Tait, S. Thomas, V. Vianu, and J. Zapletal. A series of two tutorial lectures in finite model theory will be given by R. Fagin. There will also be a number of special sessions, including (with the organizers in parentheses): computability theory (C. G. Jockusch, Jr.), finite model theory and stability theory (J. Baldwin), philosophical logic (V. McGee and G. Sher), proof theory and complexity (S. Buss), and set theory (G. Hjorth). See http://math.ucsd.edu/~asl99 and the ASL website for more information.

The 1999 ASL European Summer Meeting (Logic Colloquium '99). *August 1-6, 1999, Utrecht, The Netherlands.* The program will represent logic from a wide perspective. A featured topic will be computational logic, broadly conceived. Tutorials will be offered by G. Hjorth, J. Klop, and I. Moerdijk. Invited speakers include S. Abramsky, L. Beklemishev, D. Haskell, D. Miller, J. Rutten, P. Speissegger, and A. Weiermann. Abstracts of contributed talks must be submitted by the deadline of April 2, 1999, to the Program Chair: Wilfrid Hodges, School of Mathematical Sciences, Queen Mary and Westfield College, Mile End Rd., London E1 4NS, England; email: w.hodges@qmw.ac.uk.

Further information may also be obtained from the business office of the Association for Symbolic Logic: ASL, 1409 West Green Street, Urbana, Illinois 61801; email: asl@math.uiuc.edu; Fax: 217-333-9576. Also visit the ASL website: http://www.aslonline.org.

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ARIZONA STATE UNIVERSITY - DEPARTMENTS OF MATHEMATICS AND CHEMICAL, BIO AND MATERIALS ENGINEERING - Arizona State University invites applications for a joint senior tenure track position in the Departments of Mathematics and of Chemical, Bio and Materials Engineering commencing Fall 1999. All candidates must have a Ph.D. in mathematics, materials science or engineering, or a related area. Candidates must have an outstanding research record and a proven commitment to excellence and innovation in teaching, appropriate to rank. Candidates must have expertise in modeling and computation encompassing research in materials science or materials engineering. Candidates should expect to participate fully in cross-disciplinary programs, research, teaching and professional service, and should have an established record of research funding. The main campus of Arizona State University has approximately 49,000 students and is located in the rapidly growing metropolitan Phoenix area, which provides a wide variety of recreational and cultural opportunities. The Department of Mathematics has 57 full time faculty and the Department of Chemical, Bio and Materials Engineering has 26 full-time faculty. Outstanding computing and visualization facilities are available. Further information about the Departments of Mathematics and of Chemical, Bio and Materials Engineering can be found on the World Wide Web at http://math.la.asu.edu and http://www.eas.asu.edu/~cbme/. Applicants must send i) their resume which also identifies three people who will write letters of recommendation for them if contacted by the committee, ii) a letter stating they wish to be considered for the position and addressing their research agenda, and iii) a statement of teaching philosophy, to: **Chair, Math/CBME Search Committee, P.O. Box 871804, Arizona State University, Tempe, AZ 85287-1804.** Review of the applications will begin December 15, 1998, and will continue weekly until the position is filled. AA/EOE.

ARIZONA STATE UNIVERSITY - DEPARTMENTS OF MATHEMATICS AND ELECTRICAL ENGINEERING -. Arizona State University invites applications for a joint senior position in the Departments of Mathematics and of Electrical Engineering commencing Fall 1999. All candidates must have a Ph.D. in mathematics, electrical engineering, or a related area. Candidates must have an outstanding research record and a proven commitment to excellence and innovation in teaching, appropriate to rank. Candidates must have expertise in the modeling and computation of complex dynamical systems encompassing applications from industry or the life sciences. Preferred research areas are in control and nonlinear dynamics, (for example, neurodynamics; spatial and temporal signal processing and data analysis; complex systems). Candidates should expect to participate fully in cross-disciplinary programs, research, teaching and professional service, and should have an established record of research funding. The main campus of Arizona State University has approximately 49,000 students and is located in the rapidly growing metropolitan Phoenix area, which provides a wide variety of recreational and cultural opportunities. The Department of Mathematics has 57 full time faculty and the Department of Electrical Engineering has 40 full-time faculty. Faculty from the Departments of Electrical Engineering and Mathematics are also members of the Systems Science and Engineering Research Center (SSERC). This center has associated with it approximately 100 faculty from various engineering, science and mathematics disciplines. It sponsors many active collaborations with semiconductor, aerospace, biotechnology and chemical industries. Outstanding computing and visualization facilities are available. Further information about the Departments of Mathematics and of Electrical Engineering, and the SSERC can be found on the World Wide Web at http://math.la.asu.edu, http://www.eas.asu.edu/~eee/, and http://www.asu.edu/~sserc. Applicants must send i) their resume which also identifies three people who will write letters of recommendation for them if contacted by the committee, ii) a letter stating they wish to be considered for the position and addressing their research agenda, and iii) a statement of teaching philosophy, to: **Chair, Math/EE Search Committee, P.O. Box 871804, Arizona State University, Tempe, AZ 85287-1804.** Review of the applications will begin December 15, 1998, and will continue weekly until the position is filled. AA/EOE.

BOWLING GREEN STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND STATISTICS - Assistant Professorships in Statistics, Applied Mathematics, Algebra - The Department of Mathematics and Statistics at Bowling Green State University invites applications for three tenure-track positions at the Assistant Professor rank in the areas of Statistics, Applied Mathematics and Algebra starting August 1999. Preference will be given to those candidates who can contribute to our doctoral and masters programs. Usual duties: teach two courses each semester, conduct research and participate in service activities. A candidate for these positions will have a doctorate in mathematics or statistics, be committed to outstanding teaching and interaction with students at all levels of undergraduate and graduate study, and be able to demonstrate an exceptional potential for research. See http://www.bgsu.edu/departments/math/ BGSU is an AA/EEO employer and strongly encourages applications from women, minorities, veterans, and persons with disabilities. To apply send a *cover sheet* (*AMS* preferred), curriculum vitae, three current letters of reference (one addressing teaching), and a transcript showing the highest degree to: **Search Committee, Department of Mathematics & Statistics, Bowling Green State University, Bowling Green, Ohio 43403-0221.** Deadline for applications is January 15, 1999.

BROCK UNIVERSITY - DEPARTMENT OF MATHEMATICS - Assistant Professor in Analysis - The Department of Mathematics at Brock University invites applications for a three-year limited term appointment at the Assistant Professor level, pending final budgetary approval. The starting date is July 1, 1999. The appointment is in Analysis. Applicants should have the Ph.D. in some area of Analysis, with demonstrated research potential and a strong teaching record. The appointee will be expected to apply for research grant funding and to teach a full range of undergraduate analysis courses, including differential equations and possibly numerical analysis. In accordance with Canadian immigration requirements, this advertisement is directed in the first instance to Canadian citizens and permanent residents. Applications including a curriculum vitae and names of three referees should be sent to: **Professor H.E. Bell, Chair, Department of Mathematics, Brock University, St. Catharines, Ontario, Canada L2S 3A1,** for receipt by March 8, 1999. Brock University is committed to a positive action policy aimed at reducing gender imbalance in faculty; qualified women candidates are especially encouraged to apply.

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CALIFORNIA POLYTECHNIC UNIVERSITY, POMONA - DEPARTMENT OF MATHEMATICS - Assistant Professor - Math teach. position (expected at Assist. Prof. level) with emphasis in math education. Ph.D. in math with K-12 teaching or teacher education experience or Ph.D. in math education with master's in math or equivalent. Expected to teach wide variety of undergraduate math service courses, advise elementary and secondary teacher education students, be interested in grant writing and application of technology, serve as dept. liaison with Teacher Educ.; may advise master's candidates. Evidence of teaching excellence, ability to supervise secondary credential candidates, knowledge of current math standards, potential for conducting scholarly activities. Require application form, vitae, transcripts, min. of 3 references letters. Initial review of application begins 2/15/99 and will continue until filled. Apply: **Math Department CSU, Pomona, 3801 W. Temple Avenue, Pomona, CA 91768-4007.** 909-869-3467; Fax: 909-869-4904; e-mail: ngutierrez@csupomona.edu. AA/EEO. See http://www.csupomona.edu/~math

CALIFORNIA STATE UNIVERSITY, FULLERTON - DEPARTMENT OF MATHEMATICS - Tenure-track assistant professorship, statistics, beginning September 1999. Teaches computer-based statistics/core mathematics curriculum. Prefer interests/experience in applications, industrial outreach. Potential in undergraduate teaching/research, excellent communication skills, familiar with statistical computing. Send letter summarizing background; Curriculum Vita, three letters of reference; transcripts may be requested later. Send to: **Department of Mathematics, California State University, Fullerton, Fullerton, CA 92834-6850.** For complete ad: jsheridan@fullerton.edu. Due: January 25, 1999.

CALIFORNIA STATE UNIVERSITY, FULLERTON - DEPARTMENT OF MATHEMATICS - Tenure-track assistant professorship in applied mathematics beginning Fall 1999. Appointment at the rank of associate professor may be considered. Teaching responsibilities will include math modeling, simulation courses, and courses in the core mathematics curriculum. Computing facilities are modern and adequate. Applicants should have high potential in undergraduate teaching and research, and possess excellent communication skills. A complete application will include the following: A summary of the candidate's teaching experience and current and future research plans; a current Curriculum Vita; at least 3 letters of reference addressing the candidate's background and potential in both teaching and research; transcripts of graduate and undergraduate work. Applications should be sent to: **Chair, Applied Search Committee, Department of Mathematics, California State University, Fullerton, Fullerton, CA 92834-6850** by January 25, 1999.

CALIFORNIA STATE UNIVERSITY, LONG BEACH - DEPARTMENT OF MATHEMATICS - Tenure Track Assistant Professor in NUMERICAL ANALYSIS **(Applied Mathematics)** starting August 25, 1999. Must have Ph.D. in Mathematics or Applied Mathematics with specialization in Numerical Analysis. Duties include teaching graduate and undergraduate courses in Numerical Analysis and Applied Mathematics, research in NA/AM leading to publication, committee service including possible curriculum development. Salary $39,756-$47,844/academic year. For more information, visit www.csulb.edu/~math. Review of applications begins January 19, 1999. To apply, send curriculum vitae, three letters of recommendation, transcript from Ph.D. awarding university to: **Dr. Sam Councilman, Chair, Mathematics Department, CSULB, 1250 Bellflower Blvd., Long Beach, CA 90840-1001.** CSULB is an Equal Opportunity Employer committed to excellence through diversity and takes pride in its multicultural environment. An EEO/AA/Title IX/ADA Employer.

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for a tenure-track appointment at the assistant professor level effective Fall 1999. California State University Northridge is a comprehensive university located in the greater Los Angeles area and is in close proximity to major research universities. The Department of Mathematics has 33 full-time faculty members and offers B.A., B.S. and M.S. degrees. Candidates should have a Ph.D. in the mathematical sciences, a strong commitment to excellence in teaching both at the undergraduate and graduate level, and potential for continuing research. Since the Department has recently instituted a graduate option in applied mathematics, candidates with specialty in applied mathematics will be given particular consideration. Please send a vita, the *AMS standard cover sheet* and three letters of recommendations, one of which addresses the candidate's teaching abilities, to: **Hiring Committee, Department of Mathematics, CSUN, Northridge, CA 91330-8313** by January 22, 1999. Email (inquires only) math.hiring1@csun.edu. California State University is an Equal Opportunity, Title IX, section 503 and 504 employer.

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications from mathematicians with a focus on teacher preparation for a tenure-track appointment at the assistant or associate professor level effective Fall 1999. The candidate should have a Ph.D. in one of the mathematical sciences, experience in teacher training in a math department, experience in working with public schools, interest in mathematics teaching methodology or strong interest in the area of teacher preparation and potential for success in the training of math teachers. The duties will include, but are not limited to, developing liaisons with teachers and schools in the Los Angeles area, development of standards and curricula for the Secondary Teaching Option in our major and building professional relationships with other departments at CSUN and other universities. In addition the candidate should have a strong commitment to excellence in teaching both at the undergraduate and graduate level, and potential for continuing research. California State University Northridge is a comprehensive university located in the greater Los Angeles area and is in close proximity to major research universities. The Department of Mathematics has 33 full-time faculty members and offers B.A., B.S. and M.S. degrees. About fifty percent of our undergraduate majors choose the Secondary Teaching Option. Please send a vita, the *AMS standard cover sheet* and three letters of recommendations, one of which addresses the candidate's teaching abilities, to: **Magnhild Lien, Chair, Department of Mathematics, CSUN, Northridge, CA 91330-8313** by January 22, 1999. Email (inquires only) math.hiring2@csun.edu. California State University is an Equal Opportunity, Title IX, section 503 and 504 employer.

CALVIN COLLEGE - DEPARTMENT OF MATHEMATICS AND STATISTICS - Possible tenure-track opening in statistics beginning Fall 1999. Requires Ph.D in statistics and excellence in teaching and scholarship. Calvin College is a Christian liberal arts college, and faculty are expected to demonstrate a Reformed and Christian perspective in their professional work. Send CV, teaching statement, research program and 3 letters of recommendation to: **Chair, Department of Mathematics & Statistics, Calvin College, Grand Rapids, MI 49546** by December 31, 1998. See http://www.calvin.edu/academic/math/ for more information. EOE.

CARNEGIE MELLON UNIVERSITY - DEPARTMENT OF MATHEMATICAL SCIENCES - The Department of Mathematical Sciences expects to appoint a post-doctoral fellow beginning in September 1999. Applicants should have a strong record of accomplishment in probability research and a serious interest in the applications of probability to finance. This will be a two-year appointment, with the possibility of a third-year extension. Recipients will teach at most two courses per year. Applicants should send a vita, list of publications, a statement describing current and planned research, and arrange to have at least three letters of recommendation sent to the appointments committee. The deadline for applications is January 18, 1999. All communications should be addressed to: **Probability Post-Doctoral Committee, Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213.** Carnegie Mellon University is an Affirmative Action/Equal Opportunity Employer.

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CENTRAL COLLEGE - DEPARTMENT OF MATHEMATICS - Two Assistant Professor of Mathematics positions - Tenure-track appointment beginning August 15, 1999. Qualifications: Ph.D. in mathematics; statistics or math education considered; commitment to excellence in teaching required. Responsibilities: teach a variety of undergraduate mathematics courses at all levels of the curriculum; ongoing scholarly activity, advising, and college service are expected. For complete position description and application process, contact: **Dr. Thomas Iverson, Central College, Pella, IA 50219**, or by e-mail (inquiries only) FACSEARCH@CENTRAL.EDU. Review of materials begins December 15. 1998. AA/EOE.

COLORADO COLLEGE - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for one or more one year non- tenure track positions to begin in September 1999. The department will hire one person in applied mathematics. Applications from all fields are encouraged for any additional positions. Ph.D. in Applied Mathematics or Mathematics required for all positions. In keeping with departmental tradition, all applicants are expected to be able to teach courses across the mathematics curriculum. Review of completed applicant files will begin on 12 February 1999 and continue until all positions are filled. We encourage applications from all ranks for the position in applied mathematics, and at the assistant professor level for any additional positions. Colorado College, a leading national liberal arts college, is dedicated to greater diversity among its faculty and in its curriculum. The College welcomes members of all minority groups and reaffirms its commitment not to discriminate on the basis of race, color, age, religion, sex, national origin, sexual orientation, or disability in its educational programs, activities, and employment practices. The Department of Mathematics values both excellence in teaching and vigorous mathematical scholarship. Candidates should send a letter of application describing both their commitment to teaching and mathematical interests, a curriculum vita, and three letters of recommendation (at least one of which should address abilities as a teacher) to: **Mike Siddoway, Department of Mathematics, The Colorado College 14 E. Cache La Poudre, Colorado Springs, CO 80903.** Please indicate whether you will be available to meet with representatives of the college at the Joint Mathematics Meetings in San Antonio in January 1999. EOE (Equal Opportunity Employer).

COLORADO SCHOOL OF MINES - DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES - Assistant Professor in Math Education - Applications are invited for a position in Mathematics Education at the Professor level for Fall 1999. The successful candidate must possess a doctorate in Mathematics or Mathematics Education, show exceptional promise in the teaching of mathematics in an applied science and engineering environment and research in mathematics education, and demonstrate a commitment to support mathematics education activities both locally and at the national level. Evidence of interest or successful involvement in interdisciplinary collaborative research projects in engineering or physical science is desirable. To apply, send (a) a curriculum vitae, (b) four letters of reference, at least one of which addresses teaching ability, and (c) a statement describing teaching experience and philosophy of education to: **Colorado School of Mines, Office of Human Resources, Mathematics Education Search #98-081440, 1500 Illinois Street, Golden, Colorado 80401-1887**; fax (303) 384-2025. To guarantee full consideration, applications should be submitted by February 1, 1999. Colorado School of Mines (http://www.mines.edu) is an EEO/AA employer. Women and minorities are encouraged to apply.

COLORADO SCHOOL OF MINES - DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES - Applied Mathematics - Applications are invited for an anticipated position in Applied Mathematics at the Assistant, Associate, or Full Professor level for fall 1999. Preference will be given to candidates with expertise in areas of applied mathematics compatible with the research interest of the department. A doctorate in Mathematics or a related field is required. Applicants at the assistant professor level should have one or more years of postdoctoral experience, and show exceptional promise in teaching and research. Evidence of interest or successful involvement in interdisciplinary collaborative research projects in engineering or physical science is desirable. To apply, send (a) a curriculum vitae, (b) four letters of reference, at least one of which addresses teaching ability, and (c) a statement describing teaching experience and philosophy, and research interests and aspirations to: **Colorado School of Mines, Office of Human Resources, Applied Math Search #98-081420, 1500 Illinois Street, Golden, Colorado 80401-1887**; fax (303) 384-2025. To guarantee full consideration, applications should be submitted by February 1, 1999. Colorado School of Mines (http://www.mines.edu) is an EEO/AA employer. Women and minorities are encouraged to apply.

COLORADO SCHOOL OF MINES - DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES - Applied Mathematics - Applications are invited for a position in Applied Mathematics at the Assistant, Associate or Full Professor level for Fall 1999. A doctorate in Mathematics or a related field is required. Preference will be given to applicants with expertise in areas wave propagation, scattering and inversion compatible with the research interests of the department. It is expected that the successful applicant will play an active role in the research activities of the School's Center for Wave Phenomena. Applicants at the assistant professor level should have one or more years of postdoctoral experience, and show exceptional promise in teaching and research. Evidence of interest or successful involvement in interdisciplinary collaborative research projects in engineering or physical science is desirable. To apply, send (a) a curriculum vitae, (b) four letters of reference; at least one of which addresses teaching ability, and (c) a statement describing teaching experience and philosophy, and research interests and aspirations to: **Colorado School of Mines, Office of Human Resources, Applied Math Search #98-081410, 1500 Illinois Street, Golden Colorado 80401-1887**; fax (303) 384-2025. To guarantee full consideration, applications should be submitted by February 1, 1999. Colorado School of Mines (http://www.mines.edu) is an EEO/AA employer. Women and minorities are encouraged to apply.

COLORADO SCHOOL OF MINES - DEPARTMENT OF MATHEMATICAL AND COMPUTER SCIENCES - Applied Statistics - Applications are invited for a position in Applied Statistics at the Assistant or Associate Professor level for Fall 1999. Applicants should have a Ph.D. in Statistics ar a related field, and show exceptional promise, or, for a senior level appointment, established excellence, in teaching and research. Evidence of interest or successful involvement in interdisciplinary collaborative research projects in engineering or physical science is desirable. To apply, send (a) a curriculum vitae, (b) four letters of reference; at least one of which addresses teaching ability, and (c) a statement describing teaching experience and philosophy, and research interests and aspirations to: **Colorado School of Mines, Office of Human Resources, Applied Statistics Search #98-081430, 1500 Illinois Street, Golden, Colorado 80401-1887**; fax: (303) 384-2025. To guarantee full consideration, applications should be submitted by February 1, 1999. Colorado School of Mines (http://www.mines.edu) is an EEO/AA employer. Women and minorities are encouraged to apply.

FROSTBURG STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Frostburg State University seeks a full-time, tenure-track Assistant Professor of Mathematics to begin Fall 1999. Salary commensurate with experience and qualifications. RESPONSIBILITIES: Teach 12 credits of undergraduate mathematics per semester and share departmental responsibilities; teach mathematics content courses to elementary education majors as part of the normal course load. MINIMUM QUALIFICATIONS: Doctorate in mathematics or mathematics education; background in modeling and/or technology is welcome. Teaching experience and quality of teaching is of prime concern. Direct questions to Dr. Richard Weimer (301) 687-4384 or rweimer@frostburg.edu. Send letter of interest; resume; transcripts; and three letter of recommendation not later than February 1, 1999 to: **Frostburg State University, Office of Human Resources, ATTN: Assistant Professor of Mathematics (Position #99-1023), Frostburg, MD 21532.** FSU Is An AA/EOE. Appropriate Auxiliary Aids & Services For Qualified Individuals w/disability will be provided upon request. Please Notify In Advance. <www.fsu.umd.edu>

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GEORGIA STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Tenure-track position for assistant professor - The Department of Mathematics and Computer Sciences of Georgia State University invites applications for anticipated tenure-track positions for assistant professor beginning August 1999. Earned Ph.D. in Mathematics, or a closely related discipline, and an excellent record in publications in mathematics are required with preference for extramural funding. Preference is for individual with specialty in abstract algebra, differential equations, mathematics education, number theory, topology. Applications should send a letter of application, vita, without birthdate, but with citizenship status, and three letters of reference and transcripts of all graduate and undergraduate work to: **Chair, Department of Mathematics and Computer Science, Georgia State University, University Plaza, Atlanta, GA 30303-3083** or e-mail to: mfraser@cs.gsu.edu). Applications must be postmarked no later than February 12, 1999. Georgia State University is an EEO/AA employer.

HARVEY MUDD COLLEGE - DEPARTMENT OF MATHEMATICS - Professor of Mathematics - Harvey Mudd College invites applications for a permanent position in mathematics at the full professor level. Demonstrated excellence in teaching is absolutely essential for all candidates as is an established research program. Preference will be given to applicants in applied fields of mathematics; experience in the application of mathematics to industrial or technological problems is highly desired. The successful candidate will play a central role in the continued development and leadership of the Mathematics Clinic Program at HMC. An educational innovation of Harvey Mudd College, the Clinic programs brings together teams of students to work for an academic year on research projects sponsored by business, industry or government. Candidates should also be willing to supervise undergraduate research and work with others in the development of the undergraduate curriculum and other departmental initiatives. Harvey Mudd College is a highly selective undergraduate institution of science, engineering and mathematics; the average SAT score of entering students is over 1450. More than one-third of the student body are National Merit Scholarship finalists. Each year there are over 20 graduates in mathematics, with approximately half going on to graduate school. Over 40% of mathematics alumni from HMC have obtained a Ph.D. The college enrolls about 650 students and is associated with four other undergraduate colleges, the Claremont Graduate University, and the Keck Graduate Institute of the Applied Life Sciences, forming together an academic community of about 5,000 students. There are over 50 mathematicians in Claremont. Applicants should send a curriculum vita, a description of their teaching philosophy and accomplishments, a description of their current research program, and names and addresses of at least three persons as references. Only references of finalists for the position will be contacted. Preference will be given to applications received before February 1, 1999. Harvey Mudd College is an equal opportunity employer and is committed to the recruitment of candidates historically underrepresented on college faculties. Address for applications: **Professor Robert Borrelli, Chairman, Mathematics Search Committee, Department of Mathematics, Harvey Mudd College, Claremont, CA 91711-5990.** Email: borrelli@hmc.edu; url: http://www.math.hmc.edu

IOWA STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - The department seeks applicants, pending funding, for two tenure track positions to begin in the fall of 1999. The positions are expected to be at the assistant professor level, but exceptional applicants for a higher rank may be considered. An excellent record in research and teaching is required, and experience beyond the Ph.D. is desirable. One position is targeted at control theory and practice. We are interested in a mathematician who can interact with current faculty in the department as well as with the numerous faculty in other departments interested in control problems. The second position is targeted at areas of applied mathematics that are complementary to the existing strengths in the department. These include partial differential equations, numerical analysis, control theory, computational and mathematical biology, stochastic analysis, and discrete mathematics applied to computer science and other problems. An applicant must indicate which position(s) they are applying for and submit a vita and a brief statement describing their research accomplishments and plans. They must also arrange for the submission of their graduate transcripts and four letters of recommendation, one of which must address the applicant's teaching ability and experience. All application materials should be sent to: **Max Gunzburger, Department of Mathematics, Iowa State University, Ames IA 50011-2064.** Applicants whose completed applications are received by February 15, 1999 are assured of receiving full consideration. Iowa State University strongly encourages women and members of underrepresented groups to apply.

LEHMAN COLLEGE, CUNY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Positions are available starting September 1, 1999 for an Assistant/Associate/Full Professor in Mathematics and an Instructor/Assistant/Associate/Full Professor in Computer Science. Professorial positions require an earned doctorate, outstanding research record or potential and commitment to excellence in teaching and departmental and college-wide service. Instructor position requires a Masters' Degree and commitment to excellence in teaching and departmental and college-wide service. Appointment rank and salary commensurate with qualifications and experience. Application deadline is February 5, 1999. Application Procedure: send curriculum vitae with a cover letter (indicate position you are applying for) and arrange for at least three letters of recommendation to be sent to: **Professor Robert Feinerman, Chair, Department of Mathematics and Computer Science, Lehman College, 250 Bedford Park Blvd, West Bronx, NY 10468.** Use of the *AMS Cover Sheet for Academic Employment* is encouraged. Additional information at http://www.lehman.cuny.edu. EEO/AA/ADA Employer.

LORAS COLLEGE - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Assistant/Associate Professor of Mathematics - Full-time tenure track position in the Department of Mathematics and Computer Science. A Ph.D. in Mathematics and a strong commitment to teaching excellence are required. Duties include teaching an average of 12 credits per semester in an undergraduate Mathematics program. Scholarly activity is encouraged, recognized and rewarded; college support for it includes sabbatical and faculty exchange programs, release time, and summer research and instructional improvement grants. Candidates will be expected to support mission of the College and to respect the College's Catholic tradition. Send letter of application, curriculum vitae and three letters of recommendation addressing teaching and other qualifications to: **Chair, Mathematics Search Committee, c/o Department of Human Resources, Loras College, 1450 Alta Vista, Dubuque, IA 52004-0178.** AA/EOE. Women and minorities encouraged to apply. Position dependent on final budgetary approval. Decision anticipated in early February. For more information see http://www.loras.edu/~zettel/math_hiring.html or contact Dr. Larry Zettell, Chair, Mathematics Search Committee, zettel@loras.edu or (319) 588-7794.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - Applied Mathematics - Applications are invited for a limited number of positions in applied mathematics starting fall 1999. Available positions include instructorships, lectureships, assistant professorships, and possibly higher levels. Appointments will be made mainly on the basis of demonstrated research accomplishment and potential. Complete applications must be received by January 8, 1999. To apply, please send a vita with a description of your recent research and research plans, and arrange to have three letters of reference sent. Address: **Committee on Applied Mathematics, Room 2-345, Department of Mathematics, Massachusetts Institute of Technology, Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - The Department of Mathematics may make a few appointments at the lecturer and at the assistant professor or higher levels in **pure mathematics** for the year 1999 - 2000. The teaching load will be six hours per week in one semester and three hours per week in the other, or other combinations totaling nine hours. Open to mathematicians with doctorates who show definite promise in research. Applications should be completed by January 15, 1999. Applicants please arrange to have sent (a) a vita; (b) three letters of reference; (c) a description of your most recent research; and (d) the research that you plan for the next few years to: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer.

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UNIVERSITY OF CALIFORNIA, LOS ANGELES - DEPARTMENT OF MATHEMATICS - **Temporary Positions** - Subject to availability of resources and administrative approval: **(1)** Three E.R. Hedrick Assistant Professorships. Applicants must show very strong promise in research and teaching. Salary $47,100. Three year appointment. Teaching load: four quarter courses per year, which may include one advanced course in the candidate's field. Preference will be given to applications completed by January 6, 1999. **(2)** One or two Research Assistant Professorships in Computational and Applied Mathematics (CAM). Applicants must show very strong promise in research and teaching. Salary $47,100. 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. Preference will be given to applications completed by January 6, 1999. **(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 $50,400. 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 $41,472 or more, depending on experience. Preference will be given to applications completed by February 6, 1999. **(4)** An Adjunct Assistant Professorship. One year appointment, probably renewable once. Strong research and teaching background required. Salary $43,600-$45,900. Teaching load: five quarter courses per year. Preference will be given to applications completed by January 6, 1999. **(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.

UNIVERSITY OF CONNECTICUT - DEPARTMENT OF MATHEMATICS - Applications accepted for two tenure-track Assistant/Associate Professorships, one with responsibilities to the Actuarial Science Program. Ph.D., outstanding research credentials, and evidence of teaching competence required. Review of applications will begin December 15, 1998. More information: www.math.uconn.edu. Send materials to: **Hiring Committee, University of Connecticut, Department of Mathematics, U-9, Storrs, CT 06269.** UConn is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF MICHIGAN, DEARBORN - DEPARTMENT OF MATHEMATICS AND STATISTICS - The University of Michigan-Dearborn, plans to fill a tenure-track position in mathematics education, starting in September 1999. The position is at the Assistant or Associate Professor level and requires a doctorate in mathematics education. Demonstrated capability in teaching courses in mathematics education at the university level is desirable. The teaching load is 18 credit hours per academic year. Assistant professors receive one course released time per year for each of the first three years. To apply, send vita, transcripts, and have 3 letters of recommendation sent to: **Prof. R. Dahlke, Chair of Mathematics Education Search Committee, Department of Mathematics and Statistics, University of Michigan-Dearborn, Dearborn, MI 48128-1491.** To ensure full consideration, all application materials must be received by January 20, 1999. The committee will continue to accept application materials until the position is filled. The University of Michigan-Dearborn is dedicated to the goal of building a culturally diverse and pluralistic faculty committed to teaching and working in a multicultural environment, and strongly encourages applications from minorities and women. The University of Michigan-Dearborn is an equal opportunity/affirmative action employer.

UNIVERSITY OF MINNESOTA, DULUTH - DEPARTMENT OF MATHEMATICS AND STATISTICS - Tenure-track assistant or associate professor in the applied mathematical sciences starting 8/30/99. Preferred expertise in environment-related uses of applied and/or computational mathematics, or statistics. Teach two courses per term at graduate and undergraduate level; assist in master's program; direct student research; conduct active research program; perform usual service responsibilities. Ph.D. in mathematics, statistics or related field required by 8/30/99. Competitive salary. For more information, contact: **Dr. Bruce Peckham, Search Committee Chair, Department of Mathematics and Statistics, University of Minnesota-Duluth, Duluth, MN 55812.** Review of completed applications starts 2/1/99 and continues until position filled. Full position description and application procedures at http://www.d.umn.edu/math or email: math@d.umn.edu. The University of Minnesota is an equal opportunity educator and employer.

UNIVERSITY OF MISSOURI, COLUMBIA - DEPARTMENT OF MATHEMATICS - **Tenure-track positions** - Applications are invited to fill several tenure, tenure-track and postdoctoral positions to start in fall 1999. These positions will be in the three areas if Modern Analysis/Harmonic Analysis, Algebra/Algebraic Geometry, and Mathematical Physics. The positions require a Ph.D. in Mathematics and a proven record and experience to warrant the hiring at a given rank. Send a curriculum vitae along with a letter of application, a completed *AMS Standard Cover Sheet*, and arrange for three letters of recommendation to be sent to: **Elias Saab, Chair, University of Missouri-Columbia, Department of Mathematics, 202 Math Sciences Building, Columbia, MO 65211.** The application deadline is January 15, 1999, or until the positions are filled thereafter. For more information about our department, please visit our homepage at http://www.math.missouri.edu. AA/EEO.

UNIVERSITY OF MONTANA - DEPARTMENT OF MATHEMATICAL SCIENCES - The Department of Mathematical Sciences of The University of Montana invites applications for two tenure-track assistant professorships in algebra and statistics, starting in Fall 1999. A Ph.D. in Mathematics or Statistics, and excellence in research and teaching are required. The Department offers B.A., M.A., M.A.T. and Ph.D. degrees. More information may be obtained from http://www.umt.edu/math/, (406) 243-5311, michelj@selway.umt.edu. Applications (resume, graduate transcripts, teaching and research statements, three recommendation letters) should be sent to: **Department of Mathematical Sciences, The University of Montana, Missoula, MT 59812-1032.** To ensure full consideration, application materials should be received by January 15, 1999. The University of Montana is an equal opportunity/affirmative action employer and encourages applications from women, minorities, Vietnam era veterans, and persons with disabilities. This position announcement can be made available in alternative formats upon request.

THE UNIVERSITY OF OKLAHOMA - DEPARTMENT OF MATHEMATICS - Applications are invited for one full-time, tenured track position beginning 16 August 1999. The position is initially budgeted at the assistant professor level, but an appointment at the associate professor level may be possible for an exceptional candidate with qualifications and experience appropriate to that rank. Normal duties consist of teaching two courses per semester, conducting research, and rendering service to the Department, University, and profession at a level appropriate to the faculty member's experience. The position requires an earned doctorate and research interests that are compatible with those of the existing faculty; preference will be given to applicants with potential or demonstrated excellence in research and prior successful undergraduate teaching experience. Salary and benefits are competitive. For full consideration, applicants should send a completed *AMS cover sheet*, curriculum vitae, a description of current and planned research, and have three letters of recommendation (at least one of which must address the applicant's teaching experience and proficiency) sent to: **Search Committee, Department of Mathematics, University of Oklahoma, 601 Elm, Phsc 423, Norman, OK 73019,** Telephone: 405-325-6711, FAX: 405-325-7484, Email: search@math.ou.edu. Screening of applications will begin on December 15, 1998 and will continue until the position is filled. The University of Oklahoma is an Equal Opportunity/Affirmative Action Employer. Women and Minorities are Encouraged to Apply. OU has a policy of being responsive to the needs of dual-career couples.

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UNIVERSITY OF RHODE ISLAND - DEPARTMENT OF MATHEMATICS - Assistant Professors - Required: Applicants must have Ph.D. in Mathematics by August 15, 1999. Position one (log #021354) requires substantial expertise in different equations/discrete dynamical systems. Position two (Log #021355) requires substantial expertise in numerical methods for partial differential equations. For both positions, applicants must show the potential to teach successfully both graduate and undergraduate courses in mathematics, and for position two they must also show special potential to teach applied mathematics. Applicants for both positions must also demonstrate the potential for a quality research program in mathematics. Preferred: Applicants are preferred who are prepared to address problems of interest to the focus areas of the University; Enterprise & Technology; Health; Children, Family & Communities; and Marine & Coastal Environments. These are tenure-track appointments commencing on July 1, 1999. Submit resume, three letters of recommendation, and other relevant information by 1/25/99 to: **Betty Liu, Search Committee Chair, University of Rhode Island, Box G, Kingston, RI 02881.** The University of Rhode Island is an AA/EEO employer and is committed to increasing the diversity of its faculty, staff and students. Persons from under-represented groups are encouraged to apply.

THE UNIVERSITY OF TEXAS AT AUSTIN, DEPARTMENT OF MATHEMATICS - Openings for Fall 1999 include: **(A) Instructorships, some of which have R.H. Bing Faculty Fellowships attached to them,** and **(B) two or more positions at the tenure-track/tenure level. (A)** Instructorships at The University of Texas at Austin are post-doctoral appointments, renewable for two additional years. It is assumed that applicants for Instructorships will have completed all Ph.D. requirements by August 31, 1999. Other factors being equal, preference will be given to those whose doctorates were conferred in 1998 or 1999. Candidates should show superior research ability and have a strong commitment to teaching. Consideration will be given only to persons whose research interests have some overlap with those of the permanent faculty. Duties consist of teaching undergraduate or graduate courses and conducting independent research. The projected salary is $35,000 for the nine-month academic year. Each R.H. Bing Fellow holds an Instructorship in the Mathematics Department, with a teaching load of two courses in one semester and one course in the other. The combined Instructorship-Fellowship stipend for nine-months is $38,500, which is supplemented by a travel allowance of $1,000. Pending satisfactory performance of teaching duties, the Fellowship can be renewed for two additional years. Applicants must show outstanding promise in research. Bing Fellowship applicants will automatically be considered for other departmental openings at the post-doctoral level, so a separate application for such a position is unnecessary. Those wishing to apply for Instructor positions are asked to send a vita and a brief research summary to: **Instructor Committee, Department of Mathematics, The University of Texas at Austin, Austin, Texas 78712.** Transmission of the preceding items via email (address: **instructor@math.utexas.edu**) is encouraged. **(B)** An applicant for a tenure-track or tenured position must present a record of exceptional achievement in her or his research area and must demonstrate a proficiency at teaching. In addition to the duties indicated above for Instructors, such an appointment will typically entail the supervision of M.A. or Ph.D. students. The salary will he commensurate with the level at which the position is filled and the qualifications of the person who fills it. Those wishing to apply for tenure-track/ tenure positions are asked to send a vita and a brief research summary to: **Recruiting Committee, Department of Mathematics, The University of Texas at Austin, Austin, Texas 78712.** Transmission of the preceding items via email (address: **recruit@math.utexas.edu**) is encouraged. All applications must be supported by three or more letters of recommendation, at least one of which speaks to the applicant's teaching credentials. The screening of applications will begin on December 1, 1998. The University of Texas at Austin is an equal opportunity employer.

UNIVERSITY OF VIRGINIA - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for two tenured/tenure-track faculty positions to begin in the Fall semester 1999. Exceptional credentials/promise in both research and teaching is required. The Department will consider all areas of mathematics, but is especially interested in those fields which fit well with the strengths and interests of its current faculty (see http://www.math.virginia.edu). To apply, please send a letter of application, curriculum vitae, and at least four letter of recommendation to: **Hiring Committee, Department of Mathematics, Kerchof Hall, Cabell Drive, University of Virginia, Charlottesville, VA 22903-3199.** For fullest consideration all materials should be received by February 1, 1999. However, applications will be accepted past that time, until the positions are filled. In addition to a written application, candidates are requested to complete the electronic information form at Faculty Hiring 1999 on the Department's homepage cited above. The University of Virginia is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF VIRGINIA - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for one or more Whyburn Research Instructorships beginning in the Fall 1999. The position carries a 3-year appointment, with a reduced teaching load. In the absence of external funding, the Department can provide some summer support. Preference will be given to applicants who have received their Ph.D. within the last two years. Applicants must present strong research and teaching credentials. Research should be in an area represented by a senior member of the faculty. To apply, please send a letter of application, a curriculum vitae, and at least three letters of recommendation to: **Hiring Committee, Department of Mathematics, Kerchof Hall, Cabell Drive, University of Virginia, Charlottesville, VA 22903-3199.** The deadline for receipt are requested to complete the electronic information form located on the Department's homepage (http://www.math.virginia.edu). Click on Faculty Hiring 1999, and follow instructions. The University of Virginia is an Equal Opportunity/Affirmative Action Employer.

UNIVERSITY OF VIRGINIA - DEPARTMENT OF MATHEMATICS - Lower Division Mathematics Coordinator and Assistant Dean - Applications are invited for Lower Division Mathematics Coordinator in the Department of Mathematics and Assistant Dean in the College of Arts and Sciences at the University of Virginia. This will be 12-month appointment with 2/3-responsibilities in the Department of Mathematics and 1/3-responsibilities in the College of Arts and Sciences. The appointment will begin as early as June 1, 1999. Duties in mathematics include teaching/developing lower division courses, pedagogical training and supervision of graduate teaching assistants, and management of the Mathematics Tutoring Center. Duties as Assistant Dean included coordination of faculty advisors for a group of approximately 400 lower division students, monitoring the academic progress of approximately 800 students, and providing help and advice to those students when necessary. Preference will be given to candidates holding a Ph.D. in mathematics (or in mathematics education with a masters degree in mathematics). Candidates must demonstrate substantial excellence, experience, and commitment as teachers. Interest in educational technology, scholarly accomplishments, and other educational experience may also be considered. This position will be filled at the assistant/associate professor level in the general faculty. To apply, please send a letter of application, a curriculum vitae, and arrange for at least three letters of recommendation to: **Course Coordinator/Dean Position Committee, Department of Mathematics, Kerchof Hall, University of Virginia, Charlottesville, VA 22903-3199.** Screening of applications will begin on February 15, 1999. In addition to a written application, candidates are encouraged to complete the electronic information form located on the Department's homepage. Go to http://www.math.virginia.edu, click on Faculty Hiring, and go to the Course Coordinator/Assistant Dean Position link. The University of Virginia is an Equal Opportunity/Affirmative Action employer.

DO YOU HAVE A NEW ADDRESS? Please inform us of any changes, so we can keep our database up-to-date. Just fill out the changes using the **form on the BACK COVER** or drop us an **email**. THANKS. EMAIL: awm@math.umd.edu

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ADVERTISEMENTS

UNIVERSITY OF WISCONSIN, MILWAUKEE - THE DEPARTMENT OF MATHEMATICAL SCIENCES - Statistics Positions - The Department of Mathematical Sciences at the University of Wisconsin-Milwaukee anticipates a tenure track Assistant Professorship in applied statistics, effective September 1999. Responsibilities include: supervision of M.S. projects in Industrial Mathematics and Ph.D. theses, campus consulting, developing contacts with industry, assisting in developing the undergraduate actuarial program, and new courses, as needed (e.g. data mining). Strong research potential, extramural funding, consulting experience preferred. Send vita, research plan, teaching philosophy, and 3 letters of recommendation to: **David Schultz, Chairman, Department of Mathematical Sciences, P.O. Box 413, UWM, Milwaukee, WI 53201,** postmarked by 01/20/99. http://www.math.uwm.edu. An equal opportunity affirmative action employer, UWM encourages applications from minority and women candidates.

UNIVERSITY OF WISCONSIN, PLATTEVILLE - DEPARTMENT OF MATHEMATICS - Three tenure track position, one each in mathematics, mathematics education (elementary level) and statistics - A commitment to teaching excellence is required, as well as involvement in the activities of the Department, the University and the profession. Experience and Ph.D. in area preferred. Send application, vitae, a summary of teaching philosophy, transcripts, and three letters of recommendations, at least one of which addresses teaching to: **Frederic Tufte, Chair, Department of Mathematics, UW Platteville, Platteville, WI, 53818.** Review will begin December 1, 1998. Additional information is available at WWW site:http://vms.www.uwplatt.edu/~math/. UW-Platteville is an affirmative action, equal opportunity employer. Minorities and women are especially encouraged to apply. The names of nominees and applicants who have not requested in writing that their identities be kept confidential, and of all finalists, will be released upon request.

UNIVERSITY OF WYOMING - DEPARTMENT OF MATHEMATICS - Tenure-Track Position in Algebra/Combinatorics - The University of Wyoming Mathematics Department (Web site: http://math.uwyo.edu) invites applications for a tenure-track Assistant Professorship in Algebra/Combinatorics, to start August 1999. Applicants must demonstrate strong ability in research, breadth of mathematical knowledge, strong commitment to undergraduate and graduate teaching, and willingness to supervise masters and doctoral students. Candidates in all areas of algebra and/or combinatorics will be considered. Complete applications consist of curriculum vitae including publication list, a summary of research interests, a statement of teaching qualifications, and three letters of recommendation, sent directly to: **Dr. Benito Chen, Head, Department of Mathematics, University of Wyoming, Laramie, WY 82071-3036.** Applications received by 30 January 1999 will receive first consideration. The University of Wyoming is an affirmative action/equal opportunity employer, and we encourage women and underrepresented minorities to apply.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY - DEPARTMENT OF MATHEMATICS - Applications are solicited for an anticipated postdoctoral position for the 1999-00 academic year (with a possibility for a one year renewal if funding permits). Candidates must have received their Ph.D. in mathematics or equivalent AFTER May 1993 and are expected to have a strong record or demonstrated potential in research and teaching. Preference will be given to those who can work closely with a faculty member in her/his research area. The teaching load for the first year will be 2 courses in the first semester and 1 course in the second semester. Please send a letter of application, curriculum vitae, summary of research plans, together with four letters of recommendation (one of which addresses teaching skills), to: **John Rossi, Chair, Postdoctoral Search Committee, Department of Mathematics, Virginia Tech, Blacksburg, VA 24061-0123.** Review of applications will begin on January 25, 1999 and will continue until the position is filled. Virginia Tech has a strong commitment to the principle of diversity and in that spirit seeks a broad spectrum of candidates including women, minorities, and people with disabilities. Individuals with disabilities desiring accommodations in the application process should contact John Rossi, Department of Mathematics, 540-231-8272 (TDD/PC 1-800-828 1120--Voice 1-800-828-1140).

WAKE FOREST UNIVERSITY - DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCES - Tenure Track Assistant Professor position - Applications are invited for a tenure track position at the assistant professor level beginning August 1999. Duties include teaching statistics, operations research, and modeling at the undergraduate level, teaching in one of these areas at the graduate level, and continuing research. A Ph.D. in statistics, mathematics, or operations research is required. Leadership and participation in the departmental major in mathematical business is required; this is a joint major with the School of Business and Accountancy. Research areas of interest include optimizations, mathematical statistics, regression and time series analysis, categorical data analysis, game theory, modeling, and other areas of operations research, statistics, or applicable mathematics. Women and minorities are encouraged to apply. The department has 25 members and offers a B.S. and M.A. in mathematics, a B.S. and M.S. in computer science, and B.S. in each of mathematical business and mathematical economics. Send a letter of application and resume to: **Richard D. Carmichael, Chair, Department of Mathematics and Computer Science, Wake Forest University, Box 7388, Winston-Salem, NC 27109-7388.** AA/EEO Employer.

WESLEYAN UNIVERSITY - DEPARTMENT OF MATHEMATICS - invites applications for positions in Mathematics to begin July 1, 1999. Candidates for all of these positions must have a Ph.D. in Mathematics and are expected to have strong records in both research and teaching. **1)** Two tenure-track assistant professorships, one in the area of analysis and the other in algebra. These positions are most suitable for candidates with an established research program, typically with some postdoctoral experience. Outstanding candidates in any area of mathematics are encouraged to apply. **2)** One two-year, non-renewable position in any area of mathematics consistent with the research interests and current instructional needs of the department. Teaching duties for all positions are two courses per semester. Applications are due by February 1, 1999. Four letters of recommendation, including one which evaluates teaching, should be sent to the address below. All correspondence and applications, including *AMS Cover Sheets*, should be submitted to: **mathjobs@mail.wesleyan.edu**, or to: **Mathematics Search Committee, Department of Mathematics, Wesleyan University, Middletown, CT 06459.** Wesleyan University is committed to increasing the diversity of its faculty and is an equal opportunity/affirmative action employer.

WILLIAMS COLLEGE - DEPARTMENT OF MATHEMATICS - Tenure-eligible position in statistics, beginning Fall 1999, probably at the rank of assistant professor. In exceptional cases, however, more advanced appointments may be considered. Excellence in teaching and statistics, including scholarship and consulting, and Ph.D. required. Applicants with emphasis in operations research will also be considered. Please have a vita and three letters of recommendation on teaching and research sent to: **Hiring Committee, Department of Mathematics, Williams College, Williamstown, MA 01267.** Evaluation of applications will begin November 15, 1998 and continue until the position is filled. An an EEO/AA employee, Williams especially welcomes applications from women and minority candidates.

AWM GIFT MEMBERSHIPS: If you would like to give a gift membership to a friend or colleague, please fill out the membership form on PAGE 38 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.

ASSOCIATION FOR WOMEN IN MATHEMATICS

1998/1999 MEMBERSHIP FORM

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

LAST NAME _____ FIRST NAME _____ M.I. _____

ADDRESS_____

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Home Phone:_____ Work Phone:_____ Email:_____

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

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ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO)....**FOR ADDITIONAL POSTAGE ADD** $ 8 _____
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☐ I am enclosing a DONATION to the **"AWM GENERAL FUND"**.................. $ _____
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☐ I am also enclosing a DONATION to the **"AWM ANNIVERSARY ENDOWMENT FUND"**.................. $ _____
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INSTITUTIONAL DUES SCHEDULE

J/F99

	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]

FROM _____ (if a GIFT membership)   **TOTAL ENCLOSED** $ _____

AWM Events

AWM would like to invite you to our events to be held in conjunction with the Joint Mathematics Meetings at the Henry B. Gonzales Convention Center, the Marriott Rivercenter and Marriott Riverwalk
San Antonio, Texas, January 13-16, 1999

Preliminary Schedule as of December 15, 1998

Wednesday, January 13th

8 - 9 a.m. and 2 - 3 p.m. **MER-AWM Joint Session at the Joint Meetings** (see page 16 of this issue for more details)

3:20 p.m.- 4:20 p.m. **Panel Discussion:** *"The Education of Women in Mathematics: An International Perspective"*
Panelists: **[see program at meeting]**. At conclusion of panel, AWM will recognize the **9th Annual Alice T. Schafer Prize honorees.**

4:20 p.m. - 4:50 p.m. **Business Meeting**

6:00 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. This has been a popular, well attended event in the past.

Thursday, January 14th

9:00 a.m. - 9:50 a.m. **20th Annual Emmy Noether Lecture:** *"Aperiodic Dynamical Systems"* presented by **Krystyna Kuperberg**, Auburn Univ.
(In conjunction with Kuperberg's Noether Lecture she will organize a four part **Special Session on Geometry in Dynamics** to be held Friday, 8:00 - 10:00 a.m. (I), 1:00- 6:00 p.m. (II) and Saturday, 8:00 - 10:00 a.m. (III), 1:00- 5:00 p.m. (IV)

4:25 p.m. - 6:30 p.m. **Presentation** to the winners of the **9th Annual Louise Hay Award** for Contributions to Mathematics Education and the **9th 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 15th

8 - 11 a.m. and 1 - 6 p.m. **AMS-AWM Special Session: Geometry in Dynamics I & III** (organized in conjunction with the Noether Lecture by K. Kuperberg)

Saturday, January 16th

8 - 11 a.m. and 1 - 6 p.m. **AMS-AWM Special Session: Geometry in Dynamics III & IV** (organized in conjunction with the Noether Lecture by K. Kuperberg)

8:20 a.m. - 4:10 p.m. **AWM WORKSHOP featuring presentations by Women Graduate Students and Recent Ph.D.'s**
The entire math community is invited to attend all Workshop presentations. The AWM Workshop is supported by ONR & NSF. Organizer: Carolyn Gordon, Dartmouth College. Co-organizers: Gail Ratcliff, Univ. of Missouri, Catherine Roberts, Northern Arizona Univ.

8:30 a.m. - 10:30 a.m. **AWM sponsored research talks by recent women Ph.D.'s I**

8:30 a.m. - 8:50 a.m.	Ilene H. Morgan, University of Missouri-Rolla	*"Complete Sets of Orthogonal Frequency Hypercubes and Connections to Affine Resolvable Designs"*
9:00 a.m. - 9:20 a.m	Evelyn Sander, George Mason University	*"Unexpectedly Linear Behavior for the Cahn-Hilliard Equation"*
9:30 a.m. - 9:50 a.m.	Bina Bhattacharyya, Univ. of Ottawa/Univ. of Rome	*"Subfactors and an Algebra of Paths on Trees"*
10:00 a.m. - 10:20 a.m.	Elizabeth S. Allman, Univ. of North Carolina, Asheville	*"Subgroup Separability: a Blending of Number Theory, Geometry, & Topology"*

10:30 a.m. - 12:00 p.m. **AWM sponsored Poster Session featuring Graduate Students** (light refreshments will be available)

Julie L. Benson, Brown University	*"The Gain of Regularity for the KP-II Equation"*
Holly E. Bernstein, Washington University in St. Louis	*"Isothermic Tori with Planar Lines of Curvature"*
Maria G. Fung, Cornell University	*"Twisted Torsion on Compact Hyperbolic Spaces"*
Theresa Girardi, Rutgers University	*"On Artin's Conjecture for Icosahedral Representations"*
Rachel W. Hall, Pennsylvania State University	*"Hecke C*-Algebras"*
Natalia A. Humphreys, Ohio State University	*"Norms of powers and a central limit theorem for complex-valued probabilities"*
Edna W. James, Iowa State University	*"Stochastic Models of Physical Systems"*
(Miriam) Ruth Kantoravitz, U. of Illinois, Urbana-Champaign	*"Adams operations and the Dennis trace map"*
Colleen Margarita Kirk, Northwestern University	*"The Influence of Two Moving Heat Sources on Blow-up in a Reactive-Diffusive Medium"*
Elena Kosygina, Courant Inst. of Mathematical Sciences	*"The Behavior of Relative Entropy in the Hydrodynamic Scaling Limit"*
Amy E. Ksir, University of Pennsylvania	*"Another Reason Why Exceptional Weyl Groups are Exceptional"*
Regan E. Murray, University of Arizona	*"The Relaxation Limit in a Biodegradation Model"*
Guergana Petrova, University of South Carolina	*"Transport equations and velocity averages"*
Liya Zhornitskaya, Duke University	*"Positivity preserving numerical schemes for lubrication type equations"*

12:00 noon - 1:30 p.m. **AWM Workshop Lunch** (for participants & pre-registered attendees. For more information, contact AWM)

12:30 p.m. - 2:00 p.m. **Panel Discussion:** *"Launching a Career in Mathematics"* Panelists: **[see program at meeting]**

2:00 p.m. - 4:00 p.m. **AWM sponsored research talks by recent women Ph.D.'s II**

2:00 p.m. - 2:20 p.m.	Sharon M. Frechette, Wellesley College	*"Hecke Structure of Spaces of Modular Forms"*
2:30 p.m. - 2:50 p.m.	Kristin Lauter, University of Michigan	*"Curves over Finite Fields and Applications in Modern Technology"*
3:00 p.m. - 3:20 p.m.	Moira McDermott, Gustavus Adolphus College	*"Test ideals and computations in tight closure"*
3:30 p.m. - 3:50 p.m.	Helen Moore, Stanford University/Bowdoin College	*"Gauss Maps of Minimal Hypersurfaces with Finite Total Scalar Curvature"*

4:00 p.m. - 4:10 p.m. **AWM Workshop: Closing Remarks**

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**.

ADDRESS CORRECTION FORM

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

MAIL TO:

Database Corrections
AWM
4114 Computer & Space
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Maryland 20742-2461

or E-MAIL:

awm@math.umd.edu

AWM

ASSOCIATION
FOR WOMEN IN
MATHEMATICS

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