AWM

ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 31, Number 4 NEWSLETTER July–August 2001

PRESIDENT'S REPORT

Hello to all AWM members!

I have some good news to report: recently the funding for our Travel Grants program was renewed by the NSF. This three-year grant includes our regular travel awards and continues our newer program of mentor awards.

Also, the Nominating Committee has recently produced an excellent slate of candidates for this December's election. Carolyn Gordon (Dartmouth), who has served ably in connection with our Workshop series, will be the candidate for President-Elect. Fern Hunt (NIST), Genevieve Knight (Coppin State), Krystyna Kuperberg (Auburn), Catherine Roberts (Holy Cross), and Judy Leavitt Walker (Nebraska) have agreed to run for the three Member-at-Large positions.

The Sonia Kovalevsky High School Mathematics Days program is a crucial part of AWM's outreach efforts. Paula Kemp (Southwest Missouri State University) has agreed to chair a task force to secure continued funding and to act as an advocacy group promoting our SK Days program. See the list on page seven of universities that are receiving funding for their SK Days workshops from our most recent award cycle. If you are interested in being on this Task Force or have suggestions or questions about this program, please contact me at lenhart@math.utk.edu.

As you think ahead about your plans for the fall, here is a suggestion for a way to get involved with your local middle school. Look into MATHCOUNTS, a competition for middle school students, sponsored by the CNA Foundation, the National Society of Professional Engineers, and the National Council of Teachers of Mathematics. I coached a MATHCOUNTS team last year, really enjoyed the experience and will be doing it again this fall. If you want to participate or just want to see some very interesting math problems, check out the website www.mathcounts.org. I know that there are many other types of outreach activities for middle

IN THIS ISSUE

AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

The Association was founded in 1971 at the Joint Meetings in Atlantic City. The purpose of the association is to encourage women to study and to have active careers in the mathematical sciences. Equal opportunity and the equal treatment of women in the mathematical sciences are promoted.

The *Newsletter* is published bi-monthly. The Editor welcomes articles, letters, and announcements.

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school students. If you would like to inform our members about your favorite such activity, contact me with the information and I will spread the word.

As you receive this newsletter, the AWM workshop for female graduate students and recent Ph.D.'s at the SIAM Annual Meeting in San Diego is about to happen, July 9–10. We look forward to the AWM-MAA lecture, given by Patricia Shure of the University of Michigan, at the MAA MathFest in Madison on August 4th. We will be hosting a reception at MathFest on Friday evening, August 3rd.

At the recent Conference Board of Mathematical Sciences (CBMS) meeting on May 5th, many interesting issues were discussed. To see the report of the CBMS Mathematical Education of Teachers Project, visit the web page www.maa.org/cbms/; long and short print versions will be available by the end of the summer through the AMS and MAA. This report will generate considerable interest and debate, given the current national interest in improving the preparation of teachers. From the preface:

> This report is designed to be a resource for mathematics faculty and other parties involved in the education of mathematics teachers. It is a distillation of current thinking on curriculum and policy issues affecting the mathematical education of teachers, with the goal of stimulating efforts on individual campuses to improve programs for prospective teachers. It is also intended to marshal the backing of the mathematical sciences community for important national initiatives, such as the use of mathematics specialists to teach mathematics starting in middle grades and expanded time for professional development in the schools.

John Kenelly (Professor Emeritus, Clemson University) presented to the CBMS Council an update on the International Mathematical Olympiad (IMO) in D.C. on July 4–13. There will be a reception honoring female Olympiad competitors on July 10th, and AWM is cooperating with the IMO on this event. Jean Taylor is leading our efforts there.

Philippe Tondeur and Judith Sunley of the National Science Foundation discussed the new NSF program to implement the President's Math and Science Partnership Initiative, for which states will join with institutions of higher education to strengthen math and science education in grades K–12. Details of this implementation and newly available opportunities will be available soon; a fact sheet is currently posted at http://www.nsf.gov/od/lpa/news/media/01/fs02initiative.htm. Tondeur reported on funding for multidisciplinary mathematics research to enhance America's preeminence in mathematical sciences and on methods for attracting the best students to pursue careers in mathematics.

Also at the CBMS meeting, Carol Lacampagne (RAND) and Deborah Ball (University of Michigan) reported that the Department of Education asked RAND, a nonprofit institution helping to improve policy and

decision making though research and analysis, to convene two expert panels, one in reading and one in mathematics education. The charge of the panels is to identify key problems areas in their domains and to set priorities for research and development in those areas. The mathematics education panel is seeking feedback on the first draft of their report, which should be available soon at www.rand.org/multi/achievementforall/math.

Remember that the application deadline for our workshop for women graduate students and recent Ph.D.'s at the January Joint Mathematics Meetings is September 1st. See the sidebar on page four for other important deadlines.

Contact me if you have any suggestions or comments about AWM activities.

Enjoy the rest of your summer!

Suzanne Lenhart

Suzanne Lenhart
University of Tennessee
and Oak Ridge
National Laboratory
Knoxville, TN
May 23, 2001

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

Individual: $50 Family (no newsletter): $30
Contributing: $100 Retired, part-time: $25
Student, unemployed, developing nations: $15
Friend: $1000 Benefactor: $2500
All foreign memberships: $8 additional for postage
Dues in excess of $15 and all contributions are deductible from federal taxable income.
Institutional Members:
Level 1: $250
Level 2a: $125
Level 2b: $125
See http://www.awm-math.org for details on free ads, free student memberships, and ad discounts.
Affiliate Members: $250
Institutional Sponsors:
Friend: $1000+ Patron: $2500+
Benefactor: $5000+ Program Sponsor: $10,000+
See the AWM website for details.

Subscriptions and back orders

All members except family members receive a subscription to the newsletter as a privilege of membership. Libraries, women's studies centers, non-mathematics departments, etc., may purchase a subscription for $50/year ($58 foreign). Back orders are $6/issue plus shipping/handling ($5 minimum).

Payment

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

Newsletter ad information

AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Director of Marketing, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $60 for a basic four-line ad. Additional lines are $6 each. See the AWM website for *Newsletter* display ad rates.

Newsletter deadlines

Editorial: 24th of January, March, May, July, September, November
Ad: 1st of February, April, June, August, October, December

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Math Dept., Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; email: leggett@math.luc.edu; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Murray, Math Dept., 460 McBryde Hall, Virginia Tech, Blacksburg, VA 24061-0123; email: murray@calvin.math.vt.edu and all **education column** material to Ginger Warfield, Math Dept., University of Washington, Seattle, WA 98195; email: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 CSS Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

AWM ONLINE

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Online Ads Info
Classified and job link ads may be placed at the AWM website. Detailed information may be found there.

Website
http://www.awm-math.org

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AWM-Net
Send mail to awm-net-request@cs.umd.edu and include your email address; AWM members only.

AWM DEADLINES

NSF-AWM Travel Grant: October 1, 2001 and February 1, 2002

AWM Workshop, January 2002: September 1, 2001

Alice T. Schafer Prize for Undergraduate Women: October 1, 2001

Louise Hay Award for Contributions to Mathematics Education: October 1, 2001

2003 Noether Lecturer Nominations: October 15, 2001

AWM Essay Contest: November 1, 2001

AWM CALENDAR

AWM Workshop, SIAM meetings, San Diego, July 8–10, 2001

AWM Reception, Mathfest: August 3, 2001

AWM-MAA Lecture, Mathfest, Madison, August 4, 2001, Patricia D. Shure

AWM CONTACT INFO

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AWM ESSAY CONTEST

Biographies of Contemporary Women in Mathematics

To increase awareness of women's ongoing contributions to the mathematical sciences, the Association for Women in Mathematics (AWM) is sponsoring an essay contest for biographies of contemporary women mathematicians and statisticians in academic, industrial, and government careers.

The essays will be based primarily on an interview with a woman currently working in a mathematical sciences career. This contest is open to students in the following categories: Middle School, High School, Undergraduate, and Graduate. At least one winning submission will be chosen from each category. Winners will receive a prize, and their essays will be published online at the AWM web site. Additionally, a grand prize winner will have his or her submission published in the AWM *Newsletter*.

Contest Rules

Who can enter? This essay contest is open to students in the following categories: Middle School, High School, Undergraduate, Graduate Student At least one winning submission will be chosen from each category.

What is the subject of the essay? Your essay should be based primarily on an interview with a woman currently working in a mathematical career. The submission must be in essay form, not just a transcript of your interview.

How long should the essay be? The essay should be approximately 500 to 1000 words in length.

Who can I write about? You may interview and write about any woman currently working in a mathematical sciences career. You are encouraged (but not required) to seek out an interviewee that you do not already personally know. If you would like to be put in contact with someone who has agreed to be interviewed for this contest, please contact Dr. Victoria Howle (contest organizer) at vehowle@sandia.gov.

What should I ask in my interview? Some suggested questions for the interview and essay are: What motivated you to pursue a career in the mathematical sciences? What is your educational background? What is your family and cultural background? What kind of work do you do? What advice would you offer students who are interested in pursuing careers in the mathematical sciences? What are some of your other interests or hobbies?

How will essays be judged? Essays will be judged by a panel of mathematicians on content, grammar, and presentation.

What do I need to submit? A valid submission will contain the following information: 1. A biographical essay, based primarily on an interview, of approximately 500–1000 words in length, on a woman currently working in a mathematical career. 2. A short (approximately 100 words) biographical sketch of the student contestant. This biographical sketch should include the student's name, grade level, school, and mathematical interests. 3. Information about the student: student's name, address of student (or parent), phone number or email address of student (or parent). 4. Information about the subject of the biography: name, phone number and/or email address. All information should be submitted in plain text format.

When is the deadline? All submissions must be received by **November 1, 2001**.

Where should I send my submission? All submissions should be sent to Dr. Victoria E. Howle (contest organizer) in plain text format either by email (vehowle@sandia.gov) or to the following address: Dr. Victoria E. Howle, Sandia National Labs MS 9217, PO Box 969, Livermore, CA 94551.

All submissions become the property of AWM.

Seeking Volunteers to be Interviewed

We are currently seeking women mathematicians to volunteer as the subjects of these essays. For more information or to sign up as a volunteer, contact Dr. Victoria Howle, the contest organizer, by email at vehowle@sandia.gov.

AWM SLATE ANNOUNCED!

We are pleased to announce the slate for this fall's AWM election. Carolyn Gordon (Dartmouth College) has been nominated to serve as President-Elect. Fern Hunt (NIST), Genevieve Knight (Coppin State College), Krystyna Kuperberg (Auburn University), Catherine Roberts (Holy Cross University), and Judy Leavitt Walker (University of Nebraska – Lincoln) have accepted nominations for Member-at-Large; three will be elected.

Nominations by petition signed by 15 members are due to our president by **September 1, 2001**.

Thanks to the Nominating Committee for their efforts in producing this fine slate of candidates.

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 twelfth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in San Diego, California, January 6–9, 2002.

The letter of nomination should include, but is not 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, recommendation 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, 2001**. If you have questions, phone 301-405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

EDUCATION COLUMN

Every now and then life offers an opportunity to feel great pride about something for which one can claim no credit whatever. This column represents my celebration of just such an occasion. I am a loyal 'Mawrter: graduate of Bryn Mawr College (a liberal arts college for women), class of '63. My class sent shock waves through the system because five of us majored in mathematics. As I recall, there had been no math majors at all since my sister, five years before. The gap didn't strike anyone as odd — it was the set of five that amazed them. That was Those Days.

Sometime in the intervening period it clearly struck somebody that those low numbers were not merely odd, but actively wrong. And that somebody, or by the sound of it, those somebodies, took action — lots of it. Last week, my summer *Alumnae Bulletin* turned up, with its feature topic Math at Bryn Mawr. I opened it eagerly and was greeted instantly by some numbers: 29 math majors this year, 36 next year (respectively 9 and 11 per cent of the graduating class.) These Days are definitely different from Those Days. So I dived into the *Bulletin* in quest of the answer to the obvious question: How did they do it?

Actually, not surprisingly, what I found was not the answer but a flock of answers. One bunch hit me before I even began article reading. The illustrations included women doing dance interpretations of, for instance, Schrödinger's Equation, and the margins were filled with variations on Shakespeare's sonnets that might have startled the bard, but definitely represented someone having a lot of fun with math. ("Let me not to the analysis of true concavity points/Admit impediment...")[1] This was not the math of my day! What leapt most instantly to my mind was Hans Magnus Enzensberger's plaint in his wonderful essay *Drawbridge Up*: "This only raises the conundrum of why the general public should value gothic cathedrals, Mozart's operas and Kafka's stories so highly, but not the Method of Infinite Descent or Fourier analysis."[2] I'd say that at Bryn Mawr that sort of appreciation was definitely being encouraged!

Searching deeper for the reasons for this success story, I discovered another aspect, represented by a faculty member's remark that "I believe that one of the biggest crimes against young women in this country has been to educate them without challenging them and without setting very high expectations.... I'm thrilled that at Bryn Mawr, my students thrive on the challenge!" Her sentiments are echoed in the remarks of an alumna who, after going on for a Harvard Ph.D., is now teaching mathematics at Mills College: "I have seen many cases of exceptionally bright young women who were indoctrinated with the idea that they would never be good in math. I am proud to say that I have turned a number of cases around and I am sure the same thing happens all the time at Bryn Mawr."

That still doesn't address the nuts and bolts. You can't challenge people unless they are within range. Why does the math department have so many women staying in their vicinity, ready to be challenged? That, I'd say from my *Bulletin* explorations, has two major components. One is a huge amount of thought and effort put into the introductory courses — what is offered, how it is taught, responding to student needs. "We have been attracting record numbers of majors because, we hope, what we do in our introductory courses and in our 200-level sophomore courses tempts them." This includes, for instance, offering a course in Probability and Statistics which is light on prerequisites but mathematically serious, and encouraging a lot of cooperative work in all courses, and offering study labs for elementary courses, run by more advanced students. The attitude of the department is that everyone's learning is great and important, whatever the ultimate level the student will reach. "One of the charming characteristics of our department is that we don't believe you have to be a superstar to make worthwhile contributions to the mathematics community — or to any field — after you graduate."

Another method of making mathematics attractive is that of making students conscious of the successes of earlier math majors, both within mathematics (like the AWM's own past president, Sylvia Wiegand) and in other fields from epidemiology to business. It's fun to see one's graduates turning up on mathematics faculties, but the department's firmly maintained mantra is "Absolutely anything you want to do, you're better off with math."

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

Those elements together seem to form the core of the matter. There are, of course, all manner of other entrancing details — like the Math Shakespeare Reading Group and the Distressing Math Collective (don't worry — the distressing aspect is paradoxality), not to mention the EDGE program for Enhancing Diversity in Graduate Education, done in conjunction with Spelman College — but the heart of the success lies in the total attitude of the faculty: "It is a well-oiled machine of nurturing. As individuals and as a department, we've given every part of the program a great deal of thought to best orchestrate giving the students the maximum benefits for their education in mathematics classes. We do nothing randomly or haphazardly."

The AWM and many other people and organizations spend a good deal of thought and time trying to fathom the reasons why so many young women turn their backs on mathematics, and to look for ways to change that trend. In the midst of the ups and downs of this massive effort, it feels good to have one piece of unambiguous evidence that it can be done.

In the words of Bryn Mawrters' favorite cheer: "Anassa Kata!" This translates roughly to "Yay!"

Notes

1. This and all subsequent uncited quotations are from the Bryn Mawr *Alumnae Bulletin* for Summer, 2001, which can be found on-line at www.brynmawr.edu/Alumnae/bulletin.
2. Enzenberger, *Drawbridge Up; Mathematics — A Cultural Anathema,* published by A K Peters under the sponsorship of the AMS and its German counterpart.

SKHS DAYS

The following universities were selected to receive funding for hosting a Sonia Kovalevsky High School Mathematics Day before September 30, 2001: California State University, Stanislaus, September 29; Central Missouri State University, September 25; East Central University, September 29; East Tennessee State University, September 14–15; Elizabeth City State University, September 28; Norfolk State University, September 29; Northern Arizona University, September 15; South Dakota State University, September 21; and University of Minnesota, September 25. We gratefully acknowledge the support of the National Security Agency, Coppin State College, and Sandia/Lockheed Martin Foundation for these awards. We are seeking additional funding for awards for SK Days to be held later in 2001 and in 2002.

SLOAN RESEARCH FELLOWSHIPS

Nominations for candidates for Sloan Research Fellowships are due by **September 15, 2001**. Candidates must be members of the regular faculty at a college or university in the United States or Canada and must be at an early stage of their research careers. For information contact: Sloan Research Fellowships, Alfred P. Sloan Foundation, 630 Fifth Avenue – Suite 2550, New York, NY 10111; email: gassman@sloan.org; url: http://www.sloan.org.

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 in 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.

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. Nominations must be received by **October 1, 2001.** For more information, phone (301) 405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

BOOK REVIEW

National Academy of Sciences, Committee on Women in Science and Engineering. **Who Will Do the Science of the Future? A Symposium on Careers of Women in Science**, National Academy Press, Washington, DC, 2000. 87+xiii. ISBN 0-309-07185-2 (paper), $25.25 list price, available at the web-discounted price of $20.20 by ordering from http://lab.nap.edu/catalog/10008.html; available for free on the web at http://www.nap.edu/books/0309071852/html/.

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

The National Academy of Sciences (NAS) was chartered by Congress in 1863 as "a private, non-profit, self-perpetuating society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare." Among other rights and responsibilities, NAS "has a mandate that requires it to advise the federal government on scientific and technical matters" ([1]). In keeping with this mandate, the Committee on Women in Science and Engineering (CWSE) "was established in 1991 ... in order to coordinate, monitor, and advocate action to increase the participation of women in science and engineering" ([2]). The centerpiece of the 1999 national meeting of NAS — for the first time, ever — was a Symposium organized by the CWSE for the purpose of discussing the climate for women in science and engineering. The book under review is the written record of that symposium.

The NAS, like many honorary societies, is a conservative organization, and as such it has come under fire for its recalcitrance when it comes to electing women and minorities to its ranks ([3]). For example, a quick perusal of the online membership directory of the NAS reveals that, of the 112 living members of the Mathematics section, only four are women; of the 51 living members of the Applied Mathematics section, only three are women; and nary a one of the 26 living members of the Computer and Information Sciences section of NAS is female ([4]). At the height of the women's movement in the early 1970s, committees on the status of women were established by nearly every major scientific society in the United States ([5]). Given the glacial pace of change at NAS, the belated establishment of CWSE, though discouraging and perhaps even a little embarrassing, hardly comes as a surprise.

The good news, however, is that the CWSE — under the leadership of its co-chairs, physicist Howard Georgi of Harvard and applied mathematician Lilian Wu of IBM — seems intent upon doing constructive work on behalf of women in the sciences. In their preface, Georgi and Wu emphasize the "need to bring in many viewpoints to science and ... to increase the variety of viewpoints by recruiting and retaining women in science" (p. viii). Indeed, the proceedings of the 1999 symposium reveal a concern for the nurturance of women's scientific talent at every stage of the "pipeline," from elementary school through retirement.

Unfortunately, the proceedings of this first Symposium suggest that CWSE isn't entirely sure how the problem of recruitment, retention, and promotion of women in science should be addressed. Many of the papers seem superficial, relying on anecdotal evidence and hearsay, and offering few, if any, references to specific research findings which document claims of success. This seems a startling omission, given the historical commitment of NAS to rigorous scientific research. Taken as a whole, the papers in this volume lack coherence, and produce a rather muddy picture of what our next steps might be in addressing the problems of women in science.

Both book and symposium are divided into four main sections. Part I, "The Next Generation: Science for All Students," consists of three papers, ostensibly addressing issues of women's access to science education. The first two papers, by physicist Leon Lederman and educator Marcia Linn, describe innovative programs in science education which seem likely to have the unintended (but pleasing) consequence of increasing the retention of girls and women in pre-college science curricula. In both cases, the advantages for female students are not described explicitly; indeed, they seem to come as part of a package of positive educational outcomes which benefit students of every race, class, ethnicity, and gender more or less equally. In the third paper in Part I, Richard Tapia, an applied mathematician at Rice University, addresses the special needs of minority women students of science. Again, Tapia's comments are anecdotal, but much more clearly relevant to the topic of the symposium. His main point seems to be that the success of minority women in mathematics and the

sciences depends upon an understanding of and sensitivity to their needs, not merely as women, but as members of a *specific* ethnic minority group.

Part II of the Symposium is devoted to problems specific to the discipline of computer science. In the first paper of Part II, William Wulf, President of the National Academy of Engineering, presents clear and alarming statistics on the declining participation of women in academic computer science. He then ventures several possible explanations for the decline. Here, Wulf seems to be engaging in speculation — interesting, informed speculation, but speculation all the same. In particular, he argues that "[m]en seem to be interested in computers *per se*. They are fascinated by the device, the programming, and by the mathematics involved" (p. 35). By contrast, women are apparently interested in the computer only inasmuch as it can be used as a tool for achieving other ends. These assertions stand unsupported, and as such they constitute a dangerous generalization that can easily be used to shunt women away from areas of "pure" computer science to which they are not "naturally" suited. In the question-and-answer session for Part II of the Symposium, at least one member of the audience voiced serious concern about these generalizations, and Lilian Wu's response to this concern seemed to evade the issue rather than address it directly (p. 83). It is manifestly clear that the declining participation of women in computer science is a matter of pressing concern, as well as a fruitful field for future research.

Part III of the Symposium addresses "Strategies and Policies to Recruit, Retain, and Advance Women Scientists." Perhaps the most interesting and provocative paper in this section is that of Howard Georgi, who raises several questions and puts forward "A Tentative Theory of Unconscious Discrimination Against Women in Science." Specifically, he argues that the scientific community "unconsciously" selects for people who exhibit traits of "assertiveness and single-mindedness," while at the same time neglecting many other traits which could be of value to the enterprise of science (pp. 46–47). The questions Georgi raises are insightful and provocative, and could easily constitute a framework for future research. Also in this section of the Symposium, Karen Uhlenbeck offers a description of the Women's Mentoring Program connected with the Institute for Advanced Study and the Park City Mathematics Institute, and physicist Mildred Dresselhaus offers an entirely too brief description of the situation for women at her home institution, MIT. While Dr. Dresselhaus reports heartening statistics, a member of the audience was quick to point out that "MIT ... has zero tenured women in mathematics, and that has been the case for a long time" (p. 87). Indeed, despite good intentions, the Symposium did a rather poor job of addressing the persistent "glass ceiling" for women in science and engineering.

Part IV of the Symposium, "Advancing Women into Science Leadership," is devoted to a single paper by M.R.C. Greenwood, Chancellor of the University of California at Santa Cruz. In her paper she traces the increasing participation of women in science at every level — from bachelor's degree, to Ph.D., through the faculty ranks, on up into membership in the NAS — from the mid-1960s to the present day. She is clearly quite concerned about the various points at which the "pipeline" leaks and women abandon the pursuit of science. Her focus, naturally enough, is upon her own discipline — the biological sciences — where women's participation has been consistently greater than in the other sciences and engineering.

Interestingly, Greenwood makes the argument that "the proportion of current NAS members who are women is quite similar to the percentage of science Ph.D.'s awarded to women about 30 or more years ago, a time when many current members were receiving their doctorates" (p. 69). But upon close examination of the data, it is clear that this is not the comparison Greenwood is actually making. In fact, she finds a rough parity between the percentage of women scientists who earned their Ph.D.'s prior to 1969 and who are "currently employed in Research I and II Institutions" and the "percentage of current female NAS membership by section" (p. 70). On the basis of this comparison, one could just as easily argue that the pattern of discrimination against women in election to NAS membership has essentially kept pace with the same pattern of discrimination in hiring and promotion at Research I and II institutions!

On the whole, the NAS is to be commended for its willingness to come to grips with the problems of women in science and engineering. It is my sincere hope that future Symposia will deal much more systematically with these issues. It would be lovely to see the considerable research skills of the NAS brought to bear on the problem of shattering the glass ceiling. I look forward to seeing an NAS Symposium on the Glass Ceiling for Women in Science and Engineering in the not-too-distant future.

References

1. From the NAS website, http://www4.nationalacademies.org/nas/nashome.nsf/WebLink/AboutNAS.
2. From the CWSE website, http://www4.nationalacademies.org/osep/cwse.nsf.
3. The elitism of the NAS is the subject of a recent, high-profile article in the academic press; see Jeffrey Brainard, "Elitism, Excellence, or Both at the National Academy of Sciences?" *Chronicle of Higher Education*, Volume 47, Number 35, May 11, 2001.
4. From the NAS online membership directory, http://www4.nationalacademies.org/nas/nashome.nsf/WebLink/members.
5. See Margaret Rossiter, *Women Scientists in America: Before Affirmative Action 1940-1972*, Johns Hopkins University Press, Baltimore, 1995, Chapter 16.

CONFERENCE IN MEMORY OF RUTH MICHLER

The 2001 Annapolis Algebraic Geometry Conference: In Memory of Ruth Michler will be held October 25–28, 2001, at the U.S. Naval Academy, Annapolis, Maryland. The topics of the conference are Singularities, Commutative Algebra, and Computational Methods and Applications.

The conference organizers are Caroline Grant Melles, U.S. Naval Academy, 410-293-6708 (fax 410-293-4883), cgg@usna.edu; Lee J. McEwan, The Ohio State University, mcewan@math.ohio-state.edu; Gary Kennedy, Ohio State, 419-755-4291, kennedy@math.ohio-state.edu; and Kristin Lauter, Microsoft Research, 425-703-8335, klauter@microsoft.com.

Confirmed speakers include: S. Abhyankar (Purdue), E. Bierstone (Toronto), A. Brudnyi (Calgary), E. Hironaka (Florida State), G. Kennedy (Ohio State), K. Lauter (Microsoft), D. Massey (Northeastern), A. Nemethi (Ohio State), H. Schenck (Harvard), M. Seppala (Florida State), A. Silverberg (MSRI/Ohio State), K. Smith (Michigan), H. Stark (UC San Diego), H. Srinivasan (Missouri), A. Szilard (Barnard), M. Vitulli (Oregon), and J.F. Voloch (Texas).

There is still room for more contributed talks. If you are interested in giving one, please contact Caroline Melles by **August 24, 2001**.

Registration is $25 for mathematicians with full-time employment; $15 for graduate students and others.

For further information, see http://mathweb.mathsci.usna.edu/Faculty/Conferences/AlgGeom2001/aagc.html.

AWM-MAA MATHFEST LECTURE

Patricia D. Shure, University of Michigan, will deliver the AWM-MAA Mathfest Lecture on August 4th in Madison. Her title is "The Scholarship of Learning and Teaching: A Look Back and a Look Ahead."

Abstract

I came to the University from a background in elementary and high schools, so I spent my early years listening to children as they explained their ideas, listening to fellow teachers talk about their teaching, and sharing my own teaching experiences with anyone who would listen. Those discussions could usually have been distilled down to a few questions. "What actually makes learning happen?" "What should we be teaching our students?" "How should a teacher act?" Today, I still hear the same questions from graduate students and post-docs, from Math Education researchers, and from our senior faculty.

Where should we turn for answers to our teaching questions? I would like to see us pursue a scholarship of collegiate teaching based on analyzing our own students and informed by the work of our colleagues in K–12 research. The search for answers is rewarding, and the answers can be surprising in their simplicity.

Biographical Information

Pat Shure began her career as a mathematics specialist in elementary and high schools. In 1982, she was hired by the University of Michigan as the mathematics and science director of a program whose purpose was to support underrepresented minority students. Gradually she shifted her efforts to the Mathematics Department where she oversees the Introductory Program. Although Pat had always been associated with the precalculus and calculus programs, her involvement became much more

intense with the advent of calculus reform. She was a co-investigator for a five-year NSF grant to implement a program that made Michigan nearly unique among large research universities in operating the entire mainstream first-year calculus sequence with small classes and cooperative learning both inside and outside of the classroom.

Many new college instructors nationwide get little preparation for teaching. However, at Michigan, Pat runs an intensive Professional Development Program which trains and supervises nearly 50 newly-hired faculty and teaching assistants each year. The materials she developed for this program are used by many other universities in this country and abroad.

Over the years, in both schools and colleges, Pat has worked to attract girls and young women into mathematics. In the early 1990s she was an active co-investigator of a study financed by the Sloan Foundation which attempted to identify some of the reasons that lead women to pursue or reject careers in mathematics and physics.

Pat regularly makes presentations on topics in mathematics education at all levels from community school boards to national meetings. She currently works on issues surrounding the transition from high school to college and is co-author of a new precalculus text.

AWARDS AND HONORS

CONGRATULATIONS to all listed below for their meritorious achievements!

Alfred P. Sloan Research Fellows for 2001 include several women in mathematics and computer science. ELIZABETH D. MYNATT, Computer Science, Georgia Tech University, is the Director of the Everyday Computing Lab in the College of Computing. Her research centers around human-computer interaction, ubiquitous computing, augmented reality, auditory interfaces, assistive technology and everyday computing. DANA RANDALL, also a computer scientist at Georgia Tech, in her thesis used Monte Carlo simulations of Markov chains on two classical combinatorial problems arising in statistical mechanics: counting matchings and self-avoiding walks in lattice graphs. In recent work, she has investigated tilings in two and three dimensions. Her fields of interest include randomized algorithms, combinatorics, stochastic processes, statistical mechanics, and simulations of physical systems. KONSTANTINA TRIVISA, Mathematics, University of Maryland, College Park, works in the area of nonlinear partial differential equations and their applications. Particular research interests include: Hyperbolic Systems of Conservation Laws — Viscous Conservation Laws, Variational Problems — Phase Transitions, and Applications to Materials Science and Fluid Dynamics. CATHERINE HUAFEI YAN, Mathematics, Texas A & M University, spent academic year 2000–01 at the Institute for Advanced Studies. Her research interests are in Algebraic Combinatorics, Ordered Algebraic Structures and Probabilistic Methods. ANNA GÁL, Computer Science, University of Texas, has the following research interests: computational complexity, lower bounds for complexity of Boolean functions, fault tolerance, randomness and computation, algorithms, and combinatorics.

Year 2001 Public Service Awards were given to Congressman VERNON EHLERS (R-MI) and Dr. NEAL LANE, former Assistant to the President for Science and Technology, in May. The awards, given jointly by the American Astronomical Society, the American Mathematical Society, and the American Physical Society, are made for committed and sustained efforts in support of science.

Congressman Ehlers, one of two physicists in Congress, has been a champion for science research and education throughout his congressional career. Recently he has concentrated on K–12 science and mathematics education, introducing several bills to facilitate improvement in science and mathematics learning and teaching. Congressman Ehlers is a member of the House Committee on Education and the Workforce, as well as the House Committee on Science, and Chair of its Subcommittee on Environment, Technology and Standards.

Dr. Lane is a former Director of the NSF. He was instrumental in raising science research and education to a high priority in the Clinton Administration. The FY 2001 Federal budget, in which science agency budgets received much larger increases than in recent years, reflected Lane's efforts. Currently, Lane is University Professor and Senior Fellow at the James A. Baker III Institute for Public Policy, Rice University.

GLENDA LAPPAN of Michigan State University was elected Chair-Elect of the Executive Committee of the Conference Board of Mathematical Sciences. JEAN TAYLOR continues to serve for another year as a Member-at-Large on this Executive Committee. JOYCE MCLAUGHLIN of Rensselaer Polytechnic Institute was nominated by the Conference Board of Mathematical Sciences for the United States National Committee for Mathematics, the liaison committee for the International Mathematical Union, which is responsible for the International Congresses of Mathematicians.

GRACE WAHBA of the University of Wisconsin received a Distinguished Alumni Award from the University of Maryland, College Park.

GENEVIEVE KNIGHT of Coppin State College was a candidate for MAA First Vice-President and SUSANNA EPP of DePaul University was a candidate for MAA Second Vice-President.

CYNTHIA YOUNG HOPEN, University of Central Florida, received a 2001 ONR Young Investigator Program award. Hopen will do research in optimal signal processing methodologies for laser sensors.

FACULTY INFO 2000–2001

I. Full-Time Women Faculty in the Professoriate

Women account for 36 percent of faculty overall.

Women are most well represented at institutions without rank and least well represented at doctoral-level institutions. Women make up 50 percent of faculty at institutions without rank, 48 percent at two-year colleges with rank, 40 percent at general baccalaureate institutions, 38 percent at comprehensive institutions, and 31 percent at doctoral-level institutions.

Women are most well represented at church-related institutions and least well represented at private-independent (non-church-related) institutions. Women account for 38 percent of faculty at church-related institutions, 36 percent at public institutions, and 34 percent at private-independent institutions.

Among tenured or tenure-eligible faculty, women are most well represented among assistant professors and least well represented among full professors. Women make up 46 percent of assistant professors, 36 percent of associate professors, and 21 percent of full professors.

Women are disproportionately represented among instructors and lecturers and in unranked positions, holding 58 percent of instructorships, 55 percent of lectureships, and 48 percent of unranked positions.

Male full professors make up 28 percent of all faculty (men and women combined); female full professors account for 7 percent. Male associate professors make up 18 percent of all faculty; female associate professors account for 10 percent. Male assistant professors make up 14 percent of all faculty; female assistant professors account for 12 percent. Men who are instructors, lecturers, or in unranked positions make up 5 percent of all faculty; woman who are instructors, lecturers, or in unranked positions account for 6 percent of all faculty.

II. The Salaries of Full-Time Men and Women Professors

The salary advantage held by male faculty over female faculty holds across all ranks and all institutional types. On average, women earn 91 percent of what men earn.

The earnings gap between men and women is largest at the rank of full professor and smallest at the rank of instructor. For all institutional types combined, women earn on average 90 percent of what men earn at the ranks of assistant and associate professor, and 88 percent of what men earn at the rank of full professor.

The earnings gap between female and male faculty is largest at private-independent institutions and smallest at church-related institutions. For all ranks combined, women earn on average 93 percent of what men earn at church-related institutions, 92 percent at public institutions, and 91 percent at private-independent institutions.

The earnings gap between male and female faculty is largest at doctoral-level institutions and smallest at two-year colleges without rank. For all ranks combined, women earn on average 96 percent of what men earn at

This Faculty Salary and Faculty Distribution Fact Sheet was prepared by Marcia Bellas (University of Cincinnati) for the American Association of University Professors' Committee on the Status of Women in the Academic Profession.

two-year colleges without rank; 95 percent of what men earn at comprehensive, general baccalaureate institutions and two-year colleges with rank; and 92 percent of what men earn at doctoral-level institutions.

Among the ten highest-paying public institutions, only one (College of William and Mary) reports higher average salaries for female full professors (an advantage of 2 percent).[1] The salary advantage for men at these ten institutions averages 10 percent.

Among the ten highest-paying private institutions, only one (Rockefeller University) reports higher average salaries for female full professors (an advantage of 2 percent).[2] The salary advantage for men at these ten institutions averages 10 percent.

The data in this fact sheet are based on the 2000–2001 edition of the *Annual Report on the Economic Status of the Profession* published by the American Association of University Professors. To order a copy of the report ($68.50, including postage), visit the AAUP website www.aaup.org/Pubs.htm or call (202) 737-5900.

Notes

1. The College of William and Mary reports 29 women who are full professors and 123 men who are full professors. The ten highest -paying public institutions are, in order of rank, Rutgers (Newark); University of California, Berkeley; University of California, Los Angeles; College of William and Mary; University of Michigan, Ann Arbor; University of Virginia; Georgia Institute of Technology; Georgia State University; Rutgers (New Brunswick); and University of North Carolina, Chapel Hill.
2. Rockefeller University reports three women who are full professors and 29 men who are full professors. The ten highest-paying private institutions are, in order of rank, Rockefeller University; Harvard University; Stanford University; Princeton University; Yale University; University of Chicago; University of Pennsylvania; Babson College; Columbia University; and New York University.

NSF HONORED

Members of the congressional Science Committee commemorated the completion of 50 years of service of the National Science Foundation (NSF) in May. A presentation was made to NSF Director Rita Colwell. President Truman signed the National Science Foundation Act of 1950 into law on May 10, creating the federal government's only agency dedicated to the support of education and fundamental research in all scientific and engineering disciplines. During its 50 years, NSF has supported the research of more than half of the U.S. Nobel laureates in physics, chemistry and economics. In addition, NSF funding has contributed to such breakthroughs as the Internet, fiber optics, Doppler radar, the discovery of new planets and black holes, and artificial skin that can help burn victims.

Research Subcommittee Chair Nick Smith introduced a resolution, H.Con.Res. 108, commemorating the NSF, which passed the House and the Senate in May, 2001.

CALL FOR NOMINATIONS: THE 2003 NOETHER LECTURE

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

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

The letter of nomination should include a one page outline of the nominee's contribution to mathematics, giving four of her most important papers and other relevant information. *Five* copies of nominations should be sent by **October 15, 2001** to: The Noether Lecture Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

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

supported by the Air Force Office of Scientific Research and the Office of Naval Research, and the Association for Women in Mathematics

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

WHEN: The next AWM Workshop to be held in conjunction with the annual Joint Mathematics Meetings will be in San Diego, California, January 6–9, 2002. The Workshop is scheduled for Wednesday, January 9, 2002 with an introductory dinner and discussion group on Tuesday evening, January 8.

FORMAT: Twenty women will be selected in advance of the workshop to present their work; the selected graduate students will present posters and the recent Ph.D.'s will give 20-minute talks. AWM will offer funding for travel and two days subsistence for the selected participants. The workshop will also include a panel discussion on issues of career development, a luncheon and a dinner with a discussion period. Participants will have the opportunity to meet with other women mathematicians at all stages of their careers. All mathematicians (female and male) are invited to attend the program. Departments are urged to help graduate students and recent Ph.D.'s who do not receive funding to obtain some institutional support to attend the workshop presentations and the associated meetings.

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

ELIGIBILITY: Applications are welcome from graduate students who have made substantial progress towards their theses and from women who have received their Ph.D.'s within approximately the last five years (whether or not they currently hold a postdoctoral or other academic position.) Women with grants or other sources of support are welcome to apply. All non-U.S. citizens must have a current U.S. address. All applications should include a cover letter, a curriculum vitae, a concise description of research (2–3 pages), and a title of the proposed talk/poster. All applications should also include at least one letter of recommendation; in particular, graduate students should include a letter of recommendation from their thesis advisors. Nominations by other mathematicians (along with the information described above) are also welcome. For some advice on the application process from some of the conference organizers, see the AWM website.

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

Workshop Selection Committee
Association for Women in Mathematics
4114 Computer & Space Sciences Building
University of Maryland
College Park, Maryland 20742-2461

Phone: 301-405-7892
Email: awm@math.umd.edu URL: www.awm-math.org

APPLICATION DEADLINE: Applications must be received by **September 1, 2001**.
Applications via email or fax will not be accepted.

WOMEN, MINORITIES, AND PERSONS WITH DISABILITIES IN SCIENCE AND ENGINEERING: 2000

Frequently we at AWM receive questions about various statistics related to the participation of women in the areas of science and engineering. The report with title identical to that of this article is an excellent source for statistics about undergraduate education, graduate education, and employment in the S&E sector. The most recent issue of this report is available at http://www.nsf.gov/sbe/srs/nsf00327/, in both html format for online use and pdf format for printing things out. Below you will find the Executive Summary of this edition of the report.

EXECUTIVE SUMMARY

This report is the 10th in a series of Congressionally mandated biennial reports on the status of women and minorities in science and engineering. Its primary purpose is as an information source on the participation of women, minorities, and persons with disabilities in science and engineering.[1]

Changes since the first NSF report on women and minorities in 1982

Some of the findings in the first report of this series (NSF 1982) — the relatively small percentages of women and minorities earning science and engineering degrees and in science and engineering employment, the concentration of women and minorities in specific fields, the higher rates of part-time employment of women, the lower salaries of women and minorities, and the lower percentages of women in full professorships — still apply today. There has been progress, however, in several areas.

As did the 1982 report, the current report found that at all levels of education and in employment, women are less likely than men to choose science and engineering fields. Also, within science and engineering, women are more prevalent in some fields — psychology, social sciences, and biological sciences — than others. Data in the 1982 and this 2000 report both indicate that men and women differ little in labor force participation, but that women were more likely than men to be employed part time and to be unemployed; that women doctoral scientists and engineers employed in educational institutions were less likely than men to be tenured or have the rank of full professor — even after adjusting for age or years since doctorate; and that women scientists and engineers received lower salaries than men.

The current report also finds numerous similarities to the 1982 report's findings on participation of minorities in science and engineering. As in 1982, little difference exists among racial/ethnic groups in the proportion reporting management as their primary or secondary work activity, with the exception of Asians. A lower percentage of Asian scientists and engineers than of those from other racial/ethnic groups reported management as a primary or secondary work activity. Also, as in the 1982 report, black and Hispanic faculty were less likely than white faculty to be full professors, even after adjusting for differences in age; and blacks and Hispanics earned lower salaries than white and Asian scientists and engineers within fields and within broad age categories.

The current report found a number of areas in which progress has been made for women since the 1982 report was published. In education, both the numbers and percentages of women completing high school; enrolling in college; and completing bachelor's, master's, and doctoral degrees in science and engineering have increased over time. Women are more likely than men to graduate from high school and to enroll in college, and are as likely as men to graduate from college. In 1996, women received close to half (47 percent) of all science and engineering bachelor's degrees awarded, 39 percent of the master's degrees, and 33 percent of the doctorates. Women have accounted for an increasing percentage of the bachelor's degree recipients in all major science and engineering fields except mathematics and computer science. In science and engineering employment, women — especially younger women — are as likely as men to report management as their primary or secondary work activity. Among older age groups, however, women are

National Science Foundation, Women, Minorities and Persons with Disabilities in Science and Engineering: 2000, *Arlington, VA, 2000. (NSF 00-327)*

less likely than men to report management as their primary or secondary work activity.

Progress is also evident in the educational attainment of minorities. Both numbers and percentages of blacks, Hispanics, and American Indians completing high school; enrolling in college; and completing bachelor's, master's, and doctoral degrees in science and engineering have increased over time. On the other hand, blacks, Hispanics, and American Indians remain less likely than whites and Asians to graduate from high school, enroll in college, and graduate from college. Field choice among bachelor's and master's degree recipients is now similar among racial/ethnic groups except for Asians. Blacks, Hispanics, and American Indians earn roughly the same percentage of all science and engineering degrees as they do of non-science and -engineering bachelor's degrees.

The first Women and Minorities in Science and Engineering report in 1982 did not present data on persons with disabilities. Each report in the series since then has included some data on this population. The current report found little difference between persons with and without disabilities in undergraduate major and science and engineering occupation and relatively few differences between scientists and engineers with and without disabilities in terms of salaries, percentages in management, percentages who are full professors, and field distribution. Differences do exist, however, in educational attainment and in science and engineering labor force participation rates. Students with disabilities were less likely than those without to graduate from high school, to enroll in college, and to graduate from college. Among scientists and engineers, one-third of those with disabilities were out of the labor force in 1997, compared with 11 percent of those without disabilities. Scientists and engineers with disabilities also had higher unemployment rates than those without.

Specific concerns

In addition to examining changes in participation since the 1982 report, the current report examines some specific concerns raised in the last few years: the declining numbers and percentages of women in computer science, the declining numbers and percentages of minorities in engineering, the effects of challenges to affirmative action on the undergraduate and graduate enrollment of minorities in science and engineering, the higher attrition rates of minorities in undergraduate education, and the paucity of data on persons with disabilities in science and engineering education.

The declining numbers and percentages of women in computer science

In computer science, the numbers and percentages of bachelor's degrees to women have decreased in the last decade. Women earned 37 percent of the bachelor's degrees in computer science in 1984 and 28 percent in 1996. The number of bachelor's degrees in computer science declined from 1984 to 1996 for both men and women, but the number of degrees awarded to women dropped faster than the number of degrees to men. Women earned a slightly lower percentage of the master's degrees in computer science in 1996 than they did in 1984 (27 and 29 percent, respectively) but a higher percentage of the doctoral degrees in computer science in 1996 than in 1984 (15 and 12 percent, respectively).

The declining numbers and percentages of minorities in engineering

Minority[2] full-time first-year undergraduate enrollment in engineering decreased five percent from 1992 to 1996. Black students accounted for most of the drop: Black full-time first-time undergraduate enrollment dropped 16 percent from 1992 to 1996, and blacks were the only racial/ethnic group in which undergraduate engineering enrollment went down between 1996 and 1997. However, recently released data from the Engineering Workforce Commission show that black full-time first-time engineering enrollment increased between 1997 and 1998.

The effects of challenges to affirmative action on the graduate enrollment of minorities in science and engineering

Changes in legislation or admissions policies took place in California and Texas in 1997 that barred the use of race in graduate admissions decisions. Data from the National Science Foundation's Survey of Graduate Students and Postdoctorates in Science and Engineering show no changes in patterns of total graduate science and engineering enrollment of blacks and Hispanics in these states between 1996 and 1997.

Higher attrition rates of minorities in undergraduate education

Black and Hispanic students are less likely than white and Asian students to complete a bachelor's degree in any field within five years. Forty-eight percent of whites, 47 percent of Asians, 34 percent of blacks, and 32 percent of Hispanics who entered a bachelor's degree program in 1989 had earned their degree by spring 1994. Thirty-seven percent of both black and Hispanic students, compared with 27 percent of white students and 26 percent of Asian students, had earned no degree and were no longer enrolled toward a bachelor's after five years.

The paucity of data on persons with disabilities in science and engineering education

Two National Center for Education Statistics surveys, the National Postsecondary Student Aid Survey and the 1990 Beginning Postsecondary Students Longitudinal Study, provide some information on students with disabilities who are enrolled in undergraduate and graduate science and engineering programs, including demographic characteristics, receipt of financial aid, type of school attended, and undergraduate persistence and attainment patterns. These surveys are sample surveys of individuals.

No data on the numbers of science and engineering bachelor's and master's degrees awarded to persons with disabilities are available. Data on disabilities do not tend to be included in comprehensive academic institutional records; and, if they are, such information is likely to be kept confidential as a means of providing special services to students. To the extent that such information is collected and kept, institutions maintain these data only on those students who identify themselves to the institution as having a disability. The majority of academic institutions do not maintain records of students with disabilities in their general student record system.

Reference

National Science Foundation (NSF). 1982. *Women and Minorities in Science and Engineering: 1982*. NSF 82-302. Washington, DC.

NSF-AWM TRAVEL GRANTS FOR WOMEN

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

Travel Grants. These grants provide full or partial support for travel and subsistence for a meeting or conference in the applicant's field of specialization. A maximum of $1000 for domestic travel and of $2000 for foreign travel will be applied. For foreign travel, U.S. air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

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

Target dates. There are three award periods per year. An applicant should send *five* copies of 1) a cover letter, including the conference name, conference dates and conference location (city/state/country), 2) a description of her current research and of how the proposed travel would benefit her research program, 3) her curriculum vitae, 4) a budget for the proposed travel, and 5) information about all other sources of travel funding available to the applicant to: Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The next deadline for receipt of applications is **October 1, 2001**.

Footnotes

1. Generally, the definition of scientists or engineers used in this report includes those who hold at least a bachelor's degree in or are employed in the physical sciences: earth, atmospheric, and ocean sciences; agricultural sciences; biological sciences; mathematical sciences; computer sciences; social sciences; psychology; or engineering.
2. Minorities include Asian, black, Hispanic, and American Indian students.

OPPORTUNITIES

Travel Grants for ICM 2002, Beijing, China

The American Mathematical Society has applied to the National Science Foundation for funds to permit partial travel support for U.S. mathematicians attending the 2002 International Congress of Mathematicians (ICM 02), August 20–28, 2002, in Beijing, China. In anticipation of the availability of funds, the Society is preparing to administer the selection process, which would be similar to previous programs funded in 1990, 1994 and 1998.

Applications for support will be printed in the September issue of the *Notices*, and forms will be posted August 1 on the AMS website at http://www.ams.org/careers-edu/icmappp.html. All completed application forms must be mailed to the AMS by **October 31, 2001**. This travel grants program, if funded, will be administered by the Professional Services Department, AMS, PO Box 6248, Providence, RI 02940. You may contact us at ICM02@ams.org; 800-321-4267, ext. 4105; or 401-455-4105.

This program is open to U.S. mathematicians (those currently affiliated with U.S. institutions). Early career mathematicians (those within six years of their doctorate), women, and members of U.S. groups underrepresented in mathematics are especially encouraged to apply. ICM-02 Invited Speakers from U.S. institutions should submit applications, if funding is desired.

Applications will be evaluated by a panel of mathematical scientists under the terms of a proposal submitted to the NSF by the Society.

Should the proposal to the NSF be funded, the following conditions will apply: mathematicians accepting grants for partial support of the travel to ICM 02 may not supplement them with any other NSF funds. Currently, NSF's Division of Mathematical Sciences intends to provide no additional funds on its other regular research grants for travel to ICM in 2002. However, an individual mathematician who does not receive a travel grant may use regular NSF grant funds, subject to the usual restrictions and prior approval requirements.

All information currently available about the ICM 02 program, organization, and registration procedure is located on the ICM 02 website, www.icm2002.org.cn/.

Texas Conference for Women

The Second Annual Conference Texas Conference for Women will be held on Tuesday, November 13, 2001, at the Austin Convention Center. The keynote speakers for this educational and networking conference are Mae Jemison, Astronaut, first African-American woman to enter space; Geraldine Laybourne, CEO, Oxygen Media; and Ann Richards, former Governor of Texas. For further information, see their website www.txconferenceforwomen.org or call 512-432-1785.

CAREER and PECASE Programs

The guidelines for the NSF Faculty Early Career Development Program are now available at www.nsf.gov/cgi-bin/getpub?nsf0184. The deadline date is **July 26, 2001** for proposals submitted to the Mathematical and Physical Sciences (MPS) Directorate. Proposals must be submitted electronically.

The CAREER program is intended for the support of excellent proposals from junior faculty who combine strong research activity with a genuine and substantive involvement in education. Proposals will be evaluated on the basis of *both* research and education. For the FY 2002 competition, the minimum award is $300,000 in total for a period of five years.

NSF will select from the most meritorious awardees supported by the CAREER program the nominees for Presidential Early Career Awards for Scientists and Engineers (PECASE). PECASE awards recognize outstanding scientists and engineers who, early in their careers, show exceptional potential for leadership at the frontiers of knowledge. This Presidential Award is the highest honor bestowed by the United States government on scientists and engineers beginning their independent careers. Beginning with the FY 2001 competition, the

PECASE award is an entirely honorary award for all NSF recipients and does not provide additional funds.

Last year the Division of Mathematical Sciences responded to the high quality of the proposals in the competition by increasing the number of its Career awards to about twelve (a significant increase from prior years). In this next year, the Division plans to continue to increase funding available for the very high quality proposals received.

PUBLICATIONS OF INTEREST

The AMS announces *Mathematical Moments*, a new series of illustrated "snapshots" designed to promote appreciation and understanding of the role mathematics plays in science, nature, technology and human culture. These introductory snapshots provide a handy, eye-catching, and concise way to reach such audiences as elected officials, pre-college students, and school teachers and administrators.

The initial topics for *Mathematical Moments* are: Describing the Oceans, Designing Aircraft, Deciphering DNA, Storing Fingerprints, Investing in Markets, Creating Crystals, Seeing the World through Fractals, Experimenting with the Heart, Securing Internet Connections, Making Movies Come Alive, Listening to Music, Routing Traffic through the Internet, Tracking Products, and Forecasting Weather. *Mathematical Moments* pdf files may be freely downloaded at www.ams.org/ams/mathmoments.html. The Public Awareness Office welcomes topic suggestions and feedback on the program, which may be sent to pa-office@ams.org.

The September–October 2000 issue of *Academe*, Bulletin of the American Association of University Professors, was entitled Diversity on Campus. Although issues related to the proportion of women on faculties were raised to some degree, the main focus of the magazine was racial and ethnic diversity, with arguments both for and against affirmative action. The AAUP joined the American Council on Education in sponsoring a research project on the impact of diversity in higher education. The report produced was *Does Diversity Make a Difference? Three Research Studies on Diversity in College Classrooms*. The paragraph which follows lists some of the findings that are outlined in the Executive Summary of the first of these studies.

Upwards of two-thirds of faculty members surveyed believe that their universities value racial and ethnic diversity. More than 90 percent of faculty members indicated that neither the quality of students nor the intellectual substance of class discussion suffers from diversity. Faculty members said that diversity helps all students achieve the essential goals of a college education, that positive benefits accrue from diversity in the classroom, and that white students experience no adverse effects from classroom diversity. The vast majority of faculty members reported that student diversity did not lead them to make significant changes in their classroom practices. Faculty members reported being well-prepared to teach diverse classes and feeling comfortable doing so, yet only about one-third of them raise issues of diversity or create diverse work groups. Women faculty members, more politically liberal faculty members, and faculty members of color have more positive views of the benefits of diversity than survey respondents as a whole, while full professors and faculty with more years of teaching have less positive views of the benefits of diversity than respondents generally. Each of America's top liberal arts colleges has as its core mission a range of developmental outcomes that focus on intellectual purposes in the service of social, personal, and ethical goals. Tolerance and diversity are central to the missions of well over half of these colleges.

"Bitten by the Tech Bug" by Jackie Zakrewsky appeared in the Fall 2000 *Outlook*, the publication of the American Association of University Women. The article profiles five young women who are definitely tech-savvy. "Female computer jockeys typically cite strong support from teachers, parents, or mentors as key in surviving the 'boys only' mentality that often pervades the technology," says Zakrewsky. 11-year-old Miyo Saito described the situation at her elementary school in Los Angeles, where the so-called computer teacher clearly had difficulty performing rather simple tasks.

> While other students may have snickered, Saito took a more generous view. "We're young. We remember it," she says. "She's really old. She may have forgotten things or not have learned it."

Saito doesn't see much of a gender gap when it comes to interest in or facility with computers. "Girls

have different feelings than boys. Girls think differently than boys," she says. "Girls like computers as much as boys. Girls could make something the boys couldn't to help the world, and boys could make something the girls couldn't to help the world."

AWM was sent a copy of the February 2001 issue of *Reason: Free Minds and Free Markets*, the publication of the Reason Foundation, most likely because it contained an article entitled "Where the Boys Are" by Cathy Young. It contrasts the viewpoints of the AAUW in its reports on how society shortchanges girls and the position espoused by Christina Hoff Sommers in her controversial book *The War Against Boys: How Misguided Feminism Is Harming Our Young Men*. I was prepared to find myself incensed by the article, or at the least highly annoyed. Instead, I found it to be an interesting discussion of the varying points of view, although written from a perspective far different from my own. From the article:

> Judith Kleinfeld ... credits Sommers with drawing attention to an often-ignored problem but wishes her argument had been more nuanced. "We used to think that the schools shortchanged girls; now the news is that schools are waging a war against boys, that girls are on top and boys have become the second sex," says Kleinfeld. "Neither view is right. We should be sending a dual message: one, boys and girls do have characteristic problems, and we need to be aware of what they are; two, boys and girls are also individuals. Unfortunately, there's a lot of exaggeration going on, and a lot of destructive stereotyping by both sides."

Another point Young makes is that in 1997, 64 percent of the male high school graduates went on to college, while 70 percent of the females did. Does this mean that schools discriminate against boys? that the programs developed to help girls have succeeded too well? Perhaps the answers are instead rooted in class values — much of the current edge for young women's higher college enrollment may be explained by the proportions of women vs. men from working-class and poor families.

> Early "school turnoff" may cause many boys to develop an anti-learning mindset the British have labeled "laddism" — a mirror image of the pre-feminist notion that it isn't cool for a girl to be too bright. "The boys become oppositional and band together in the belief that manly culture doesn't include grade grubbing," observes ... Kleinfeld.

Beyond the "Gender Wars": A Conversation about Girls, Boys, and Education was published by the AAUW Educational Foundation in February 2001. The report is based on a symposium held in September 2000. In it, participants "share their visions of what would constitute a truly equitable and effective education for girls and boys, their understanding of how gender interacts with other aspects of students' identities, their responses to and revisions of the gender wars debate, and their recommended priorities for achieving better education for boys and girls." From the conclusion of the report:

> Toward the end of their conversation, participants shared some priority issues for both boys and girls in the 21st century. The discussion began with the premise that although individuals will always be different (and thankfully so) in their preferences, abilities, and needs, differences between boys and girls as groups in how they perceive schooling, perform in certain areas, and experience school life are more a creation of how adults socialize children toward particular gender identities and less a natural crystallization of fixed biological differences between the sexes. The breathtaking and exciting pace of change in boys' and girls' — and men's and women's — identities over the last four decades alone attests to the profound influence of social and cultural factors in shaping individuals' preferences and sense of their potential. Participants agreed that we do not need to fix the boys or fix the girls; instead, we need to fix the institutions, communities, schools, practices, and expectations that limit both girls' and boys' sense of themselves, their options, or their ability to express themselves as full human beings across a variety of social roles.

"Strength in Numbers" by Deanna Haunsperger and Stephen Kennedy appeared in a recent issue of the MAA *Focus*. The article describes the value to young women of participating in the Carleton and St. Olaf Colleges' Summer Mathematics Program, which is regularly advertised in these pages. From the article:

> The students return to their home institutions eager to plunge into their studies. They have a clearer idea of what mathematics is and how to organize their future plans. Their increased awareness of various topics within mathematics have led many to give talks in their home departments on the mathematics that they have learned

> in the summer program.... Perhaps more important than the knowledge and renewed excitement for mathematics, each of the students has gained confidence in her ability to do mathematics.

Sharing the Burden: Women in Cryptology during World War II is a short booklet written by Jennifer Wilcox in 1998 for the Center for Cryptologic History, National Security Agency. It begins with the story of how Genevieve Grotjan made a crucial correlation which, along with the efforts of others, enabled a machine for decoding Japanese diplomatic messages to be decoded. It ends:

> Thousands of women helped to win World War II through their cryptologic efforts. Few will know the significance of their contribution or of the lives they helped save. Although women have long been a part of cryptologic history, even before the Second World War, the presence of servicewomen in cryptology allowed others to follow. Their dedication and abilities proved, to more than one doubting male commander, that women could more than adequately do this exacting, detailed, and important work. They left behind a strong legacy, allowing thousands of women to follow in their footsteps. These women played vital roles throughout the Cold War era and will continue to bring their talents, skills, and abilities to cryptology, one of the nation's most secret sciences.

"Engaging Girls with Computers through Software Games" by Cecilia M. Gorriz and Claudina Medina appeared in the January 2000 issue of the *Communications of the ACM*. The authors focus on the experiences of girls with computer games, as a way to explore the "growing concern ... that girls are losing interest in computers, and thus, computer science, very early in the pipeline."

Mattel's "Barbie Fashion Designer," which appeared in November 1996, sold very well in 1996 and 1997. This success indicates that there is a market for software and games targeted at girls. However, only 12% of multimedia games are bought by females, perhaps reflecting the emphasis on fighting and combat in many of these games, as in general women and girls prefer adventures or games with narrative structure.

Among younger girls, there is near parity in use of online services with boys in that age range. By the early teen years, online use by girls drops significantly in comparison with boys. The authors believe this is due to the lack of compelling content for young girl teens.

Purple Moon, a software company marketing games, interviewed 2000 girls between the ages of 8 and 12 to see what appealed to them. They found that girls prefer collaboration to competition, puzzle-solving skills to tests of their eye-hand reflexes, complex social interactions to fighting and killing. "Girls enjoy identifying with real-life characters ... and, like to act out characters, as if they were in a story...."

The conclusion reads:

> Growing up learning and playing with computers may enable girls to be at ease with software products and become familiar with computers and their use. Moreover, playing computer games may encourage girls to pursue computer courses at early stages, and entice them to regard computer science as an attractive career choice. To succeed in this enterprise of engaging girls to play with computer games, companies are focusing on those activities that girls like the most. Research and already successful games show that girls may enjoy computer games if they provide compelling content and appropriate software design. Furthermore, the girls' market could represent a beachhead toward a home software market for a new generation of females. Women who do not work in business or computer-related jobs represent a difficult market to enter. Future generations of females will become savvy users and buyers of hardware and software.

My Dance Is Mathematics is a booklet of poems published by the author, JoAnne Growney (147 West 4th Street, Bloomsbury, PA 17815; growney@sunlink.net). Many of these poems have appeared in *Mathematics Magazine*, the *American Mathematical Monthly*, and other publications.

The Winter 2001 issue of *AWIS Magazine* contained the fascinating article "The Cholera Lesson: Improving the quality of life with low-cost water filtering systems" by Catherine Dodd. Rita Colwell, until recently the Director of the NSF, has spent much of the past 25 years "convincing the scientific world that *V. cholerae* might not behave as everyone had assumed." She has devised a simple sari-cloth filter for removing cholera bacteria from drinking water, which is now being tested by 4000 families in Bangladesh.

ADVERTISEMENTS

AWM EVENTS at the MATHFEST 2001

August 2 - 4, 2001, University of Wisconsin, Madison, Wisconsin

AWM Reception — **Friday, August 3, 2001, 9:00 p.m. - 11:00 p.m.**

The reception follows the Frame Lecture. All supporters of women in mathematics are encouraged to attend.

AWM-MAA Invited Address — **Saturday, August 4, 2001, 8:30 a.m.-9:20 a.m.**

"The Scholarship of Learning and Teaching: A Look Back and a Look Ahead" presented by Patricia D. Shure, University of Michigan

For further details on the **Mathfest 2001** meeting see:

<http://www.maa.org/meetings/mathfest01_frontpage.html>

AWM is also pleased to announce that Professor Ingrid Daubechies, Princeton University will be presenting the Hedrick Lecture Series (Wavelets in Action) at Mathfest 2001.

Lecture 1:	***Wavelets in Approximation Theory***	**Thursday, August 2, 2001**	**9:30 a.m. - 10:20 am**
Lecture 2:	***Wavelets and Signal Compression***	**Friday, August 3, 2001**	**9:30 a.m. - 10:20 a.m.**
Lecture 3:	***Wavelets and Subdivision***	**Saturday, August 4, 2001**	**9:30 a.m. - 10:20 a.m.**

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A W M

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Volume 31, Number 4, July–August 2001

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