AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

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PRESIDENT'S REPORT

Dear Friends,

For those of us who are academics, summer is a time to create, travel, relax. We hope you will find the time to attend the summer events described below.

July 12–14 SIAM Workshop in Toronto

Our workshop in conjunction with the SIAM meetings at the University of Toronto showcases talented advanced graduate students and new Ph.D.'s as well as established speakers with useful information for the young professionals. The formal presentations of the program begin on July 13 and are open to the public. Suzanne Lenhart of the University of Tennessee is the organizer of the workshop.

July 15–17 MAA Mathfest in Toronto

While we're in the neighborhood, AWM is joining the MAA Mathfest at Ryerson University. Asia Ivic Weiss of York University is the local organizer for AWM Mathfest activities. At 9:30 A.M. on Thursday, July 16, AWM President-Elect Jean Taylor of Rutgers will give the first of her three MAA Hedrick Lectures on "Geometric Variational Problems." At 2:50 P.M. Thursday, Margaret Wright of Bell Labs will give an invited MAA/AWM address. AWM and MAA will jointly hold a reception that evening at 9 P.M. (after the SIAM barbecue). Another event of interest is the program "She Does Math: Exemplary Women in Mathematics-Related Careers," presented by Carolyn Connell, Kathleen Sullivan and Virginia Knight, 4:10–6:00 P.M. on Saturday, July 18. The complete Mathfest schedule is available at http://www.maa.org/meetings/programtable.html. We especially look forward to meeting many Canadian supporters of women in mathematics at the Toronto events.

August 21–22, Berlin ICM

We invite all registrants for the International Congress of Mathematicians (ICM) in Berlin (August 18–27) to a program of special

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.
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events highlighting women in mathematics. Bhama Srinivasan (chair of the committee; University of Illinois at Chicago, U.S.), Bettye Anne Case (Florida State University, U.S.), and Christine Bessenrodt (University of Magdeburg, Germany), who together represent AWM, the European Women in Mathematics (EWM) and the Committee on Women and Mathematics of the European Mathematical Society, organized the panel discussion "Events and policies: Effects on women in mathematics" to be held at 7:30 P.M. Friday evening, August 21. In the same room at 9:15 P.M. the EWM-produced film "Women and Mathematics across Cultures" will be shown; it was directed by Marjatta Naatanen (Helsinki, Finland) in collaboration with Bodil Branner (Lyngby, Denmark), Kari Hag (Trondheim, Norway) and Caroline Series (Warwick, UK). Saturday, August 22, at 11:00 A.M., Cathleen Synge Morawetz, Courant Institute, New York University will deliver a special lecture, titled the Emmy Noether Lecture. Her topic is "Variations on Conservation Laws for the Wave Equation."

The complete schedule for the ICM is available at http://elib.zib.de:88/cgi98, and the portion of the Session on Special Events related to the above programs is described there in Circular Letter #24.

San Antonio Update

The Noether lecture, titled "Aperiodic Dynamical Systems," will be given by Krystyna Kuperberg of Auburn University. In conjunction with her lecture, Krystyna is organizing a joint AMS/AWM Special Session on Dynamical Systems.

Olga Taussky-Todd Update

The date for our celebration in honor of Olga Taussky-Todd has been set; it will be held July 16–18, 1999 (if funded) at the Mathematical Sciences Research Institute (MSRI) in Berkeley. In honor of the diversity in Taussky's career, we will be celebrating mathematical women in the full spectrum of possible careers. Participants will include established mathematicians, advanced graduate students and recent Ph.D.'s; local graduate students, college faculty, and secondary teachers will be invited to join some of the activities. We're in the process of applying for funding; the funding effort has been spearheaded by Bettye Anne Case (Florida State University). The other PI's are Dianne O'Leary (University of Maryland), Gail Ratcliff (University of Missouri at St. Louis), Jean Taylor (Rutgers University) and myself.

Treasurer Transition

We are sorry that Kay Smith of St. Olaf College will be resigning as treasurer due to other commitments. Thank you so much, Kay, for your dedication and wonderful contributions to AWM! We welcome Amy Cohen of Rutgers as our new treasurer.

Good News: Funding from Exxon

We are grateful to the Exxon Education Foundation for a recent grant of $5000 in unrestricted funds. As we have said before, grants which can be applied to our general operating funds are especially important to our health as an organization.

More Good News: Bill for Women in Science

A promising new bill has been supported in the House. The House Science Subcommittee on Technology passed H.R. 3007, the Advancement of Women in Science, Engineering, and Technology Development Act. Introduced by Rep. Connie Morella (R-MD), the bill would establish a commission to study the barriers that women face in science, engineering, and technology. For more details, see the article on page 23.

Even More Good News: An Interview with Melanie Wood, Olympiad Team Member

For the first time, the U.S. Mathematical Olympiad team includes a young woman, Melanie Wood from Indiana. She shared First Place Honors on the USAMO with Alexander Schwartz from Pennsylvania. Both had participated in the 1996 and 1997 Mathematical Olympiad Summer Programs; they will be outstanding representatives of the U.S. at the 1998 IMO, to be held in Taipei, Taiwan July 15 and 16.

SW: How do you feel about the Olympiad and being on the team?

MW: I'm tremendously excited about it and about getting to go to Taiwan.

SW: How did you get started with this?

MW: I've participated in the Math Olympiad summer camp for two summers, after grades 9 and 10. I loved the camp and set the goal to make the team. I knew there had been no female before. I worked hard to learn the mathematics involved and prepare for the test; when it came I was ready. At first I worried about the pressure there might be to perform well in Taiwan if I made the team, but now I think it will be okay.

SW: Do you notice a difference between girls and boys in their attitudes towards competitions? That girls don't like competition?

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Dues in excess of $10 and all contributions are deductible from federal taxable income.

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Level 2 (one free basic job ad and up to three student memberships): $80 ($105 foreign)
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Subscriptions and back orders

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

Payment

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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.* A basic ad is four lines of type. Institutional members receive one free basic job ad as a privilege of membership. For non-members, the rate is $60 for a basic ad. Additional lines are $6 each.

Deadlines

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

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Department of Mathematical and Computer Sciences, 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, Department of Mathematics, 460 McBryde Hall, Virginia Tech, Blacksburg, VA 24061-0123; email: murray@calvin.math.vt.edu and all **education column** material to Ginger Warfield, Department of Mathematics, University of Washington, Seattle, WA 98195; email: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461; phone: (301) 405-7892; email: awm@math.umd.edu.

MW: I've known so few females interested in math, I couldn't say. For me, I hated the idea of winning and competing. This is something I've had to work at and get over. That seems to be a difference between me and the boys, but I don't know if it's a gender thing. There's so small a sample.

SW: Did you know there is an Association for Women in Mathematics and there are a lot of women interested in mathematics? At a lot of universities, fifty percent of the undergraduate math majors are female. But still there aren't many women involved in math competitions.

MW: No, I didn't know that.

SW: We'll send you some materials. What math do you like?

MW: I like algebraic number theory!

SW: When you were at the summer camp, were there other girls there?

MW: The last two summers there were two girls, and last year there were 23 boys. Usually there are about 30 boys and one or no girls.

SW: Do you think that makes it hard for the girls?

MW: I've been in on discussions of whether girls should be given some preference so that there would be at least three or four. That seems to me to be a bad idea. If you jump down [in standards] to get girls, the girls would have trouble, especially in this camp.

Bad News: Science Research Support Fizzled

In the last newsletter we reported on the Congressional funding for scientific research. Recently a gloomy email message arrived from a member of the House Committee on Science who has been involved in the national efforts for science (see page 21). It is no longer likely that the National Science Foundation budget will be increased much; this has been confirmed by others knowledgeable about the situation. While we were rejoicing about the good effects of our lobbying, we slacked off, but other constituencies kept pushing for support. Since funds are limited, their gain is a loss for science. The message is clear: we need to push harder for science support.

APPEAL TO AWM MEMBERS: Please contact your legislators to resurrect the Doubling bill and the support for science! The AMS has prepared an action item on their web page (http://www.ams.org/government/news.html), complete with telephone numbers, addresses and a sample letter to use. Don't make it easy for them to forget us!

Web Page Now Open!

New AWM web editor Tammy Kolda has now officially opened the new AWM Web Page at http://www.awm-math.edu. Check it out regularly and watch it develop! Submit ideas to Tammy at kolda@msr.epm.ornl.gov, and we'll run them through our approval process.

Thoughts Inspired by Mother's Day

My mother, Elizabeth Dunnett Young, was a gentle, kind, Englishwoman, a little lacking in self-confidence, but sincere and demonstrative in her appreciation of others. She always looked for and found reasons to admire everyone she met. She loved her family and friends and had a deep respect for all living things. She captivated little children. Her empathy was not limited to humans: she "rescued" sickly plants she found in retail outlets and was a dedicated bird and waterfowl advocate.

Her mother, Agnes Mecklenberg Dunnett, was a brilliant pioneering woman doctor: Agnes' practice even supported her large family when my grandfather's business folded. Elizabeth, who was Agnes' driver and a nursing assistant for a time, stopped her education after attending an elite English public school. She felt inferior about her lack of higher education in our highly educated family, yet she outclassed the rest of the family in people skills, and she constantly sought learning and involvement in literature, singing and languages, which she loved all her life. When Mother was old and very frail, we arranged for a young Chinese woman to help her each noon for a brief time; it turned out Mother was much more interested in learning Mandarin than in having lunch!

Although Elizabeth was a selfless modest homemaker, many of her friends were high achievers; she encouraged them, was impressed by them and appreciated them. I cannot begin to enumerate the many ways I benefitted from her encouragement and support. Now, too late, I regret not giving her more encouragement herself. I owe her a great deal.

At the start of my AWM Presidency, I was ambitious to accomplish a lot in my term for

women in the mathematical sciences. Now, I see that an important part of the job requires my mother's gentle talents: to enable a successor to lead, to allow others to contribute their talents and visions, to ensure the organization will thrive. And it is a relief that everything is not the task of one person alone!

And so I am grateful to all the wonderful supporters and helpers who do the work and provide the funds for AWM!! Thank you! You are credits to the organization — and to your mothers!

Happy Summer!

Sylvia

Sylvia Wiegand
June 1, 1998
on sabbatical at Purdue
West Lafayette, Indiana

PRESIDENT'S TRAVEL

Purdue

I am still relishing the last months of my stay at Purdue. Tami Worner has written an article for us about programs for women in science here (see pages 19–20). At a recent lunch meeting held by the Dean of the School of Science for women faculty in the School, the Strategic Plan for Purdue was discussed: its first goal is to increase the number of women. ("Try to get enough so that we don't all fit in this conference room!" exclaimed one woman.) Purdue has taken some steps to accomplish such an increase; one is a spousal program to help attract couples to the faculty. If the university has a primary interest in one half of a couple, the Provost and the Dean may be able to contribute funds for up to three years to support 2/3 of the salary of the spouse, so that the department where he/she is hired gets a faculty member for just 1/3 the usual cost.

AMS Science Policy

In early April the Committee on Science Policy of the American Mathematical Society met to discuss the efforts of the scientific community to encourage greater support for research. Sarah Horrigan of the U.S. Office of Management and Budget gave a comprehensive analysis of the national budget process. Jim Turner from the House Science Committee discussed the proposals in support of scientific research. Two speakers representing Senator Frist's Science Committee and his office explained that although Frist supports scientific research, he does not feel the Doubling in a Decade Bill is "fiscally responsible." As a father, he is "disappointed" by the performance of the U.S. on international math exams. His solution is that states and districts should allocate their funds creatively; we asked if there might be national standards even if the states work separately to meet them. Cathleen Morawetz mentioned two pessimistic reports related to the future of education: (1) There is rapid teacher turnover: on average a teacher lasts three years; and (2) whereas formerly the U.S. could count on dedicated outstanding women to teach, now women are leaving teaching for better careers. Teaching needs to be better rewarded as it is in other countries. According to National Academy of Sciences representative Deborah Stine, the U.S. still leads in mathematical research, but its position is fragile because of the lack of support and the poor outlook for the future of research (especially with the bad news about mathematics education).

A science writer from the *Washington Post*, Curt Suplee, gave an amusing and cogent, but depressing, view of his business, which "is not the news media but the ad media." Everything in the newspaper is targeted for selling ads; news is piggybacked on. (Ads typically fill 60% of a newspaper.) As far as news stories about mathematics go, we can expect at most one or two per year, such as when Fermat's last theorem was solved. In order to get mathematics into the news, we should capitalize on major events by describing the mathematics involved, for example in landing a jeep on Mars. He suggests we follow the lead of The American Physical Society, which has an on-line service for the media giving simplified explanations and sources of further information about articles to appear in its main journal. One problem, according to the mathematicians present, is that "mathematicians won't lie; simplified explanations are lies."

In Don Lewis' discussion of the NSF, he first mentioned next year's NSF Graduate Fellowship Awards; in each discipline the awards were given to 1/7 of the applicants — thus if mathematics had had more applicants, it probably would have received more awards. He asked that we encourage applications for the good of the discipline as a whole. The rules now allow even third-year students to apply, so that students at lesser institutions with poorer backgrounds initially might get an award later.

In 1999 the NSF budget for research awards will be increased, but the number of awards will go down. The Mathematics Division has been asked to give bigger awards, with funding for grad students to be included in most grants. I said this would discourage people: it is advantageous for the NSF and the profession to have a lot of applications, but if fewer awards are given, the difficulty of the application procedure will deter people from applying. He answered that for regular awards, it was less apparent that the number of awards was tied to numbers of applications; he encouraged applying for EPSCOR grants.

Highlights of Lincoln Centennial

In 1896 Albert Candy earned the first Ph.D. in mathematics at the University of Nebraska in Lincoln, but due to a technicality the Ph.D. was not officially awarded until 1898. The Department of Mathematics and Statistics celebrated the centennial anniversary of the first Ph.D. with a big bash in May of this year, attended by about 300 people.

The Chancellor of the University opened the ceremonies; he mentioned the outstanding record of the department in encouraging women. The Dean said that he had never heard a word of complaint about instruction in the department.

To punctuate the Dean's remarks, a tornado warning sounded; we all rushed to the basement and stayed there for forty-five minutes. This interlude didn't seem to dampen spirits; the enthusiastic participants soon became caught up in small conversations.

The celebration included several lively informative plenary lectures about the directions of the department in various research fields and in public policy and education. Department Chair Jim Lewis gave an inspiring keynote address at the banquet, highlighting the department's success in research and graduate education and documenting the great strides taken by our department in recruitment and retention of women in our graduate program. Judy Walker led a discussion of the All Girls, All Math high school camp sponsored by the department last summer for the first time (see the November–December 1997 *Newsletter*) which will be held again twice this summer.

The first woman Ph.D. at Nebraska was Mildred Gross in 1963 — she nearly quit, but her advisor, Walter Mientka, persuaded her and her husband that it was all right for a woman to receive a Ph.D. even if her husband didn't — she was preceded by 14 male Ph.D.'s. From 1963 to 1993, 97 men received Ph.D.'s and seven women did so. The participation of women has increased spectacularly since then;

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 and should be received by **October 1, 1998**. For more information, phone (301) 405-7892 or email awm@math.umd.edu. Nominations via email or fax will not be accepted.

from 1994 to 1997 there were 21 men and 13 women — in 1997, Ph.D.'s were awarded to seven men and six women!

How did the department increase the percentage of women Ph.D.'s to almost 50 percent? Jim Lewis credits the excellence of female undergraduate and graduate students in recent years. Also, the department has worked hard to encourage and recruit women and has paid special attention to mentoring them, especially just before graduate school. Apparently recruiting makes a real difference.

For 16 years I was the only woman on the faculty of the department, but prior to my arrival at Nebraska, Lulu Runge had taught for 44 years (1909–1953), and she was the only woman for 24 of them. This academic year the department has three women faculty members out of about 34 (not counting people on leave). Susan Hermiller and Lisa Orlandi-Korner will join the department next year.

Other trips

In addition we made brief but enjoyable visits to the University of Cincinnati, Florida State University and the University of New Orleans; I gave talks on my research and a "road show" talk on women in mathematics. At Cincinnati, a young woman mentioned that her peers hear that "it is not cool to be in math." A male graduate student observed that among the math majors in his classes, the guys were going to grad school, the women were going to be teachers. Faculty member Tara Smith feels there is more discouragement for women at each successive stage; women were encouraged in high school, but less in college, still less in grad school.

We have appreciated talking with all of you supporters of women in mathematics; together we'll make things better.

AWM DEADLINES

Put these important dates on your calendar! We welcome applications and nominations for our various awards and grant programs. For information on the programs, see pages 6, 7, 24 and 25. Note that we are currently inviting applications for *two* workshops.

- AWM Workshop (Joint Meetings, San Antonio, 1/99): September 1, 1998
- AWM Workshop (SIAM Meeting, Atlanta, 5/99): January 4, 1999
- Alice T. Schafer Prize: September 15, 1998
- Louise Hay Award: October 1, 1998

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 ninth annual Schafer Prize will be awarded at the Joint Prize Session at the Joint Mathematics Meetings in San Antonio, TX, January 1999.

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. Supporting materials (e.g., reports from summer work using math, copies of talks given by members of student chapters, transcripts) should be enclosed with the nomination. *Five* complete copies of nomination materials for this award should be sent 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 and should be received by **September 15, 1998**. Early submissions are encouraged.

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

AWARDS AND HONORS

Ron Lancaster, mathematics teacher at St. Mildred's-Lightbourn School in Oakville, Ontario, has won his third Hilroy Award. Given by the Hilroy Foundation to recognize innovative and creative teaching, the Awards are similar to the Presidential Awards for U.S. teachers. St. Mildred's is an all-girls school where Lancaster has been on staff for seven years as a middle school and high school mathematics teacher.

Over the past two years, Ron has developed several Math Trails in the downtown area of Toronto, including walks in the financial district and in the Eaton Centre; his most recent award was for this work. The Math Trails, designed primarily for his grade 7 mathematics classes, have been very popular with students and parents at St. Mildred's. These projects have given his students an opportunity to connect their mathematical learning to other subjects such as art, architecture, public art, public spaces, science and many other topics.

Ron Lancaster

An article entitled "A measure of success" by Janice Mawhinney in the Toronto *Star* describes a January 1997 trip down a Math Trail taken by one of his classes:

> The students spent several hours walking around a variety of buildings and sites with a list of 56 questions prepared by Lancaster.
>
> They measured certain sites with tape measures. They described sculptures in mathematical terms and counted the number of shapes they could see in them. They compared the cost of parking at a meter on the street to paying the $40 daily maximum in the underground parking lot at 95 Wellington St. W.

Senior students accompany the younger ones and serve as mentors for them.

Lancaster has given over 400 talks to teachers, all over North America and in Indonesia and the Philippines as well. He has been involved with two major television series for TVOntario, one of which won a Gold Medal at the 1990 International Film and TV Festival of New York; he has also been a guest on CBC Radio where he discussed mathematical ideas for the general public. Recently he has been involved with the revision of the U.S. National Standards for School Mathematics.

Lee Lorch, B.A. '36 and M.A. '41, was given a Distinguished Alumni Award by the McMicken College of Arts & Science, University of Cincinnati, May 7, 1998. His citation reads:

> Professor Emeritus and Senior Scholar at York University in Toronto, Professor Lorch is a world-renowned leader in hard analysis and has made contributions to the theory of trigonometric series, summability theory and special functions. His many publications in top journals span six decades. Professor Lorch is also known for his contributions to the education of minorities and for his courageous actions in support of civil rights. His first full-time academic position was at City College of New York in 1946. He was dropped several years later without explanation after he and his wife participated in an attempt to desegregate an apartment complex in New York. Persisting in this effort also cost his next job at Penn State, in 1950.

When the United States Supreme Court ruled against school segregation in 1954, Professor Lorch was chair of the mathematics department at Fisk University at that time. He attempted to enroll his daughter in a black school, the school nearest their home. He was thereupon summoned before the House Committee on Un-American Activities and was subsequently dropped from the faculty by the Board of Trustees, over the opposition of his colleagues.

In 1955, Professor Lorch moved to Arkansas to take a position at Philander-Smith College in Little Rock. Continued participation in civil rights activities made the family unwelcome there as well. By 1959, Lorch was blacklisted, and it was impossible for the family to find employment in the United States, so they moved to Canada. He then taught at the University of Alberta from 1959–1968 and went to York University in 1968.

Professor Lorch has been awarded honorary degrees from City University of New York, Fisk University and York University. In 1976, he received a special award from Howard University for his contributions to civil rights and to the education of black mathematicians. He received a similar award from the U.S. National Academy of Sciences in 1990. Professor Lorch is a Fellow of the Royal Society of Canada and of the American Association for the Advancement of Science.

CONGRATULATIONS to Ron and Lee!

IAS MENTORING PROGRAM

Thirty-five women gathered in May at the Institute for Advanced Study for an intensive ten-day residential program designed to encourage women to further their mathematics education. The program brought an international group of women mathematics students in contact with postdoctoral scholars and active professional mathematicians and also prepared the women to attend a special three-week long mathematics program sponsored by the Institute for Advanced Study later this summer on representation theory of Lie groups. The Mentoring Program is funded by the National Science Foundation and consists of lectures, seminars, working problem groups, and mentoring and networking sessions. In preparation for the summer program, the Institute for Advanced Study/Park City Mathematics Institute, the women in the mentoring program explored various aspects of representation theory, working in small groups and in close coordination with outstanding mathematical mentors. Students and mentors took part in the life of the Institute for Advanced Study and had the opportunity to meet with mathematicians in residence at the Institute.

The program is intended to help participants overcome some of the obstacles which have for many years kept low the number of women mathematicians. In addition to intensive courses on mathematics, an additional offering was titled "The Women-in-Science Seminar." Readings and class discussions in this seminar explored many issues related to women developing careers in science and mathematics. In addition, guest speakers such as Joan Feigenbaum and Anna Gilbert, both working at AT&T, spoke to the group about their experiences as mathematicians.

The mentoring program is under the direction of mathematics professors Chuu-Lian Terng of Northeastern University and Karen Uhlenbeck of the University of Texas at Austin, both visiting scholars at the Institute for Advanced Study this year. Local residents Ingrid Daubechies and Nancy Hingston, mathematicians at Princeton University and the College of New Jersey respectively, served on the Organizing Committee.

The summer program, the Institute for Advanced Study/Park City Mathematics Institute, is a flagship national program run by the Institute with major funding from the National Science Foundation. Now in its eighth year of operation, the program brings together high school teachers, undergraduate and graduate students, undergraduate faculty, and researchers in both mathematics and mathematics education, allowing them to come together as equal partners in a supportive setting where education at all levels is the primary concern.

A follow-up project is part of the program, with partnerships between universities and local school districts across the country providing sites that offer ongoing support for the continuation of the summer session work. The goal is to bring together high school teachers, university mathematicians and students of mathematics in support of secondary teachers and schools. Rider University is in its second year as a site for this continuing outreach program.

Georgia Whidden, IAS

EDUCATION COLUMN

In the May–June issue of this *Newsletter* I gave a few personal ruminations on the implications of the TIMSS reports. One was that some (emphatically not all) of the distressing comparative scores result from elements of our culture which are inextricably entwined with some of our fundamental strengths. I still hold to that opinion, but in my efforts to state it compactly I was guilty of both oversimplification and inaccuracy. This issue's column is devoted to the thoughtful and interesting response I received from Cathy Kessel at UC Berkeley.

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

More comments on TIMSS

In discussing TIMSS, Ginger Warfield wrote in the Education Column of the May–June issue, "[O]ur students will never approach tests with the heartfelt sincerity of those facing examinations whose outcomes will determine irrevocably which doors in life will be open and which slammed shut and locked. The art of studying for tests will never rise to the heights here that it does in countries which have such examinations — but neither, it is to be hoped, will the rate of student suicide." I think this statement needs elaboration and modification.

Japan did have a very high rate of youth suicide in the 1950's, but things have changed. As reported by Catherine Lewis in her very interesting book *Educating Hearts and Minds*, 1991 and 1992 statistics show that youth suicide rates are lower in Japan than in the United States. (The number of suicides per 100,000 for 15- to 19-year-olds was 3.8 in Japan and 11.1 in the United States. For 20- to 24-year-olds, it was 10.4 in Japan and 15.1 in the United States.[1]) Thomas Rohlen, an anthropologist who studies Japanese education, points out that since 1959 the youth suicide rate has been decreasing and the proportion of students applying to universities has been increasing.[2] He says there is no evidence that exams cause a large proportion of suicides.

I think it quite likely that students in the United States will never approach tests with the "heartfelt sincerity" of students in other countries — at least given our current practices. Students in the United States are the most heavily tested in the world — and many become bored, cynical, or depressed about taking standardized tests.[3] Standardized tests are often not aligned with curricula and test results are often misused or misinterpreted. Studies reveal that as students take more of these tests their disillusionment about tests grows, their motivation to give genuine effort decreases, and their use of inappropriate strategies increases. In 1990, the National Council on Testing and Public Policy estimated that the cost to taxpayers of purchasing and scoring standardized tests was over $100 million. This estimate does not include the 10 to 20 school days spent preparing for these tests each year — time that might be better spent on other forms of instruction.[4] Not surprisingly, teachers find this situation alienating.[5]

Cross-national comparisons might lead us to question our testing practices. For instance, there is no tracking, ability grouping, retaining in grade, or skipping grades in Japan.[6] The Japanese apparently see no need to give students standardized tests at the end of Grades 2 through 12 as is commonly done in the United States to determine student placement, student promotion to the next grade, teacher merit pay, school funding, and real estate prices.[7] Instead, most Japanese students take their first high-stakes examination in 9th grade at the end of lower secondary school. High school (upper secondary school) is not compulsory in Japan. In 1996, however, 97 percent of the 9th grade age cohort went on to high school. Students must apply to high school and take entrance exams (which are not standardized but developed by each prefecture). High school admissions decisions are based on course grades and exam performance. At the end of high school Japanese students take their second high-stakes examination — for university admissions. They get a second chance — and many others — to retake this exam. "Reapplying and retaking the exams is not frowned upon. In fact, it is encouraged in many ways, and a large number of students do it."[8]

Cross-national comparisons might also lead us to question our teacher-preparation practices. Mathematics education researchers have found that one's knowledge of mathematics affects what and how one teaches.[9] It is fairly well-known among mathematics education researchers that preservice elementary teachers' knowledge of elementary mathematics tends to be shaky.[10] This is hardly the fault of the teachers — they are the recipients of the education that our society thinks is adequate for their work. Our society may change its opinion after

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discovering that Chinese elementary teachers, who receive only nine years of schooling and two to three years of teacher training, have a deeper understanding of elementary mathematics than a group of "better than average" beginning and experienced U.S. elementary teachers.[11] Even more interesting is what the Chinese teachers know and how their working conditions support the growth of their mathematical knowledge and its organization for teaching.

Statistical results from TIMSS and other cross-national comparisons suggest there may be something rotten in the state of our educational system. Qualitative descriptions of the mathematical knowledge and educational practices of other countries may help us to understand what is strange about our familiar educational practices and clean up our act.

Footnotes

1. C. Lewis, *Educating Hearts and Minds: Reflections on Japanese Preschool and Elementary Education*, New York: Cambridge University Press, 1995.
2. T. Rohlen, *Japan's High Schools*, University of California Press, 1983.
3. G. Madaus, The effects of important tests on students: Implications for a national examination system, *Phi Delta Kappan 73*, 226–31, 1991.
4. S. Paris, T. Lawton, J. Turner, & J. Roth, A developmental perspective on standardized achievement testing, *Educational Researcher 20*(5), 12–20, 1991.
5. M. Smith, Put to the test: The effects of external testing on teachers, *Educational Researcher 20*(5), 8–11, 1991.
6. See p. 15 of Lewis. Ironically, this may be a legacy of the U.S. occupation after World War II (see *Japan's High Schools*).
7. Paris, Lawton, Turner, & Roth.
8. American Federation of Teachers, *What Students Abroad Are Expected To Know About Mathematics*, 1997.
9. See for example, R. Heaton, Who is minding the mathematics content?: A case study of a fifth grade teacher, *Elementary School Journal 93*(2), 153–162, 1992; A. Thompson, Teachers' beliefs and conceptions: A synthesis of the research, in D. Grouws (Ed.), *Handbook of Research in Mathematics Teaching and Learning*, 127–146, Macmillan, 1992.
10. See for example, D. Ball, Prospective elementary and secondary teachers' understanding of division, *Journal for Research in Mathematics Education, 21*(2), 132–144; M. Simon, Prospective elementary teachers' knowledge of division, *Journal for Research in Mathematics Education, 24*(3), 233–254, 1993.
11. L. Ma, in preparation, *Knowledge and Teaching Competence: Exploring Mathematics Teaching Superiority from a Cross-national Perspective*, Lawrence Erlbaum Associates.

AWM WEB SITE

The Association for Women in Mathematics (AWM) is pleased to announce the creation of its new website at http://www.awm-math.org.

This site contains information about the organization and its history, downloadable membership applications, contact information for all the officers, AWM *Newsletter* editorial and advertisement guidelines, and information about ordering two popular brochures: "Profiles of Women in Mathematics: The Emmy Noether Lectures" (online version available) and "Careers That Count."

Further, the site has information about the many programs and awards AWM sponsors for female mathematicians at all stages of development such as the NSF-AWM Travel Grants for Women, NSF-ONR-AWM Workshops for Women Graduate Students and Postdoctoral Mathematicians, AWM Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate Woman, AWM Louise Hay Award for Contributions to Mathematics Education, Sonia Kovalevsky High School Mathematics Days, and Emmy Noether Lecture Series.

Last but not least, the AWM has gathered an extensive collection of links to online resources for and about women in mathematics, mathematics in general, women in science, and women in general.

We encourage you to visit our site and add a link to the AWM at http://www.awm-math.org on your site today. Send any comments or questions to awm-webmaster@awm-math.org.

Happy surfing, Tamara Kolda, AWM Web Editor

SLOAN FELLOWSHIPS

Nominations for candidates for Sloan Research Fellowships are dues by **September 15, 1998**. Candidates must be members of the regular faculty at a college or university in the United States or Canada and must be at an early stage of their research careers. For information write: Sloan Research Fellowships, Alfred P. Sloan Foundation, 630 Fifth Avenue - Suite 2550, New York, NY 10111; email: gassman@sloan.org; www: http://www.sloan.org.

AWIS CAREER IN SCIENCE SYMPOSIUM

On the fourth of April, a cold and rainy Saturday, AWIS, the Association for Women in Science, held its first "Career in Science Symposium and Workshops" at the National Science Foundation in Arlington, Virginia.

The audience consisted of 110 women and (as far as I could tell) one man from a variety of technical and scientific fields, ranging from college students and young Ph.D.'s to those re-entering the work force or seeking to change careers. This diversity was especially interesting to me because I usually associate with mathematicians in an academic setting.

The morning session began with a warm welcome followed by the keynote address delivered by Dr. Vera Rubin, a distinguished astronomer from the Carnegie Institute and recipient of the National Medal of Science. Besides her extremely impressive research record — for example, she discovered the existence of dark matter in the universe — I was most inspired by her enormous enthusiasm for her work, her delicious sense of humor and her personal courage. The message I took home was "follow your heart and do not give up."

The rest of the morning session was devoted to a panel discussion, where women from different science backgrounds discussed various choices of careers in science. Joy Bryant, who holds a graduate degree in polymer science, talked about what is involved in being a patent agent — unfortunately not an option for mathematicians and computer scientists. Elia Ben-Ari, a Ph.D. in pharmacology, told us about her transition to science writing after holding a two year post-doc position at the National Cancer Institute. She now is the features editor at *BioScience*, a monthly journal. Toby Horn, a Ph.D. in molecular biology, shared her experience of becoming a teacher and curriculum manager at a magnet high school after many active years in research. Julia Moore, Director of Legislative and Public Affairs at the National Science Foundation, spoke about a career in science politics. Cynthia McIntyre, an assistant professor in physics at George Mason University, told us about the frustrations (such as grant writing) and pleasures of academia. Mary Clutter described her journey in science from a Ph.D. in biology to becoming the Assistant Director of Biological Sciences of the National Science Foundation.

What was most interesting about these presentations was the uniformly high level of dedication and effort these women brought to their work in comparison to the wide range of salaries and personal and professional satisfaction they received. For example, one could say that a career in politics pays better than teaching or writing by a factor of five, but the real question to ask oneself is, is it as personally rewarding?

The afternoon session consisted of workshops on resume writing, networking, skills assessment, interviewing skills and interpersonal communication. Lots of material was handed out and all in all, the workshop was extremely interesting, informative, illuminating and yes, useful.

I certainly hope that the symposium will become a regular event, and I appreciate the enormous effort the organizers put into it. It paid off.

Ruth Pfeiffer, Department of Mathematics, University of Maryland

NMSU HOLIDAY SYMPOSIUM

The Twenty-Third Holiday Symposium: Algebraic Structures For Logic will be held at New Mexico State University, Las Cruces, NM, January 8–12, 1999. The centerpiece of the program will be five one-hour lectures given by each of W. Blok (University of Illinois at Chicago) and B. Jonsson (Vanderbilt University). The lecture series will give a comprehensive view of the current state of algebraic logic and its universal algebraic counterparts in a manner accessible to graduate students and researchers from logic, universal algebra, and the information sciences. The purpose is to strengthen the cross-fertilization between research in logic and universal algebra and to make accessible powerful recent techniques to potential users. Research papers on related topics will be presented as well.

Call for Papers: Abstracts should be sent to the organizers by **November 7, 1998.**

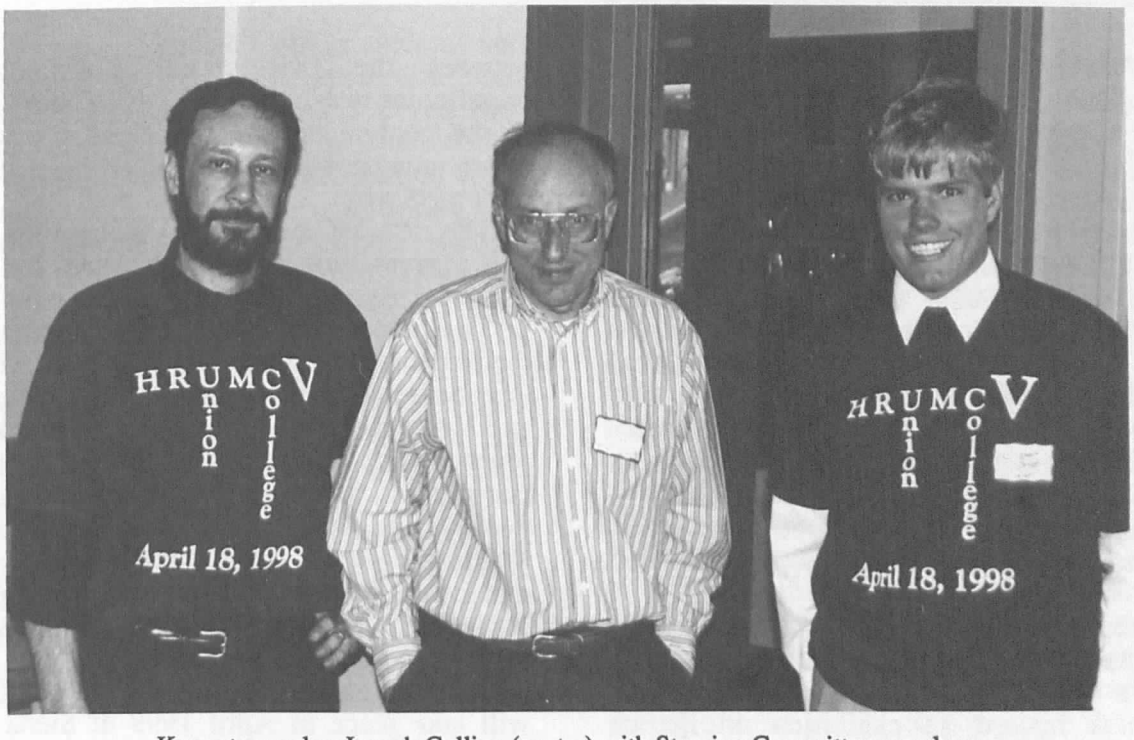
The organizers are M. Gehrke and J. Harding (New Mexico State University). For further information, see the web site at math.nmsu.edu/~holsymp, email holiday@nmsu.edu, or fax (505) 646-1064.

HUDSON RIVER UNDERGRAD MATH CONFERENCE, 1998

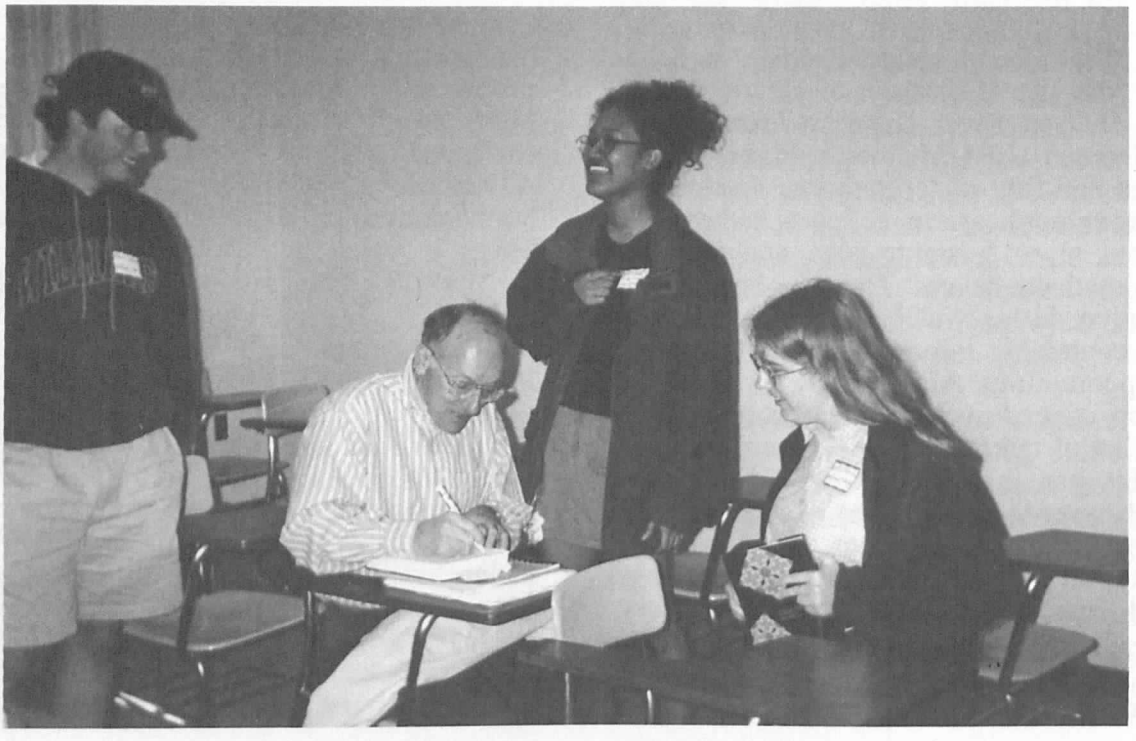
April 18, 1998 found Union College in Schenectady, NY the site of a bustle of activity as the fifth annual Hudson River Undergraduate Mathematics Conference (HRUMC) took place. Nearly three hundred and fifty undergraduate students and professors from northeastern colleges gathered to attend lectures, give 15-minute talks, and socialize with fellow mathematicians. The day began well with registration during which students could pick up booklets containing information about research and career opportunities. After registration, students and professors chatted over breakfast while looking through the list of talks. Since there were over ten different talks per time slot, it was difficult to decide which ones to go to. Over a hundred talks covered a variety of subjects, not only traditional areas such as algebra, analysis, topology and applied mathematics, but also topics like mathematics and music, history of mathematics, mathematics education, and computer science. Many talks had creative titles designed to attract audiences, such as "Zeck and Lekk's Excellent Adventure," "The Rook Polynomial and Drunken Mathematicians," and "Bouncing Balls and Techno Music."

After the first session of talks, students and professors gathered to hear the keynote speaker, Professor Joseph Gallian of the University of Minnesota-Duluth, speak on topology and graph theory in his talk "Touring a Torus." His lecture introduced students to the opportunities in math using his summer research program and his students' results as an example. His talk was a success; many students expressed their newfound enthusiasm for math, especially first-time HRUMC attendees. Patty Hines, a Williams College undergraduate and one of these first-time attendees, said, "The whole conference was inspiring and motivating. It made me realize that mathematics is what I

Davina Kunvipusilkul, Williams College, Class of 1999 and Leila Zelnick, Williams College, Class of 2000



Keynote speaker Joseph Gallian (center) with Steering Committee members William Zwicker (left) and Graham Bryce (right)



Joseph Gallian autographing copies of his book for Williams College students
Patty Hines (center), Leila Zelnick (right), and Chris White (left)

want to do." After the talk and throughout the conference, students asked Professor Gallian to autograph their copy of his book, *Contemporary Abstract Algebra*.

The conference then adjourned to a delicious lunch provided free to all registered conference attendees. While waiting in line, HRUMC participants could vote for their favorite math pun. A sample: "What kind of car does Joe Gallian drive? A Taurus." They were also treated to the musical offering of Helen Moore of Bowdoin College, who sang a tribute to calculus entitled "Closer to Sine." Lunch provided a time for students and faculty from different colleges to socialize with each other. It was a time to gather different perspectives on research, graduate schools and even topics unrelated to math.

Before the afternoon sessions started, Union College invited conference participants to visit Nott Memorial, a 16-gon building in the center of campus which housed an exhibition on French children of the holocaust. The afternoon talks were also attended enthusiastically. There was a tea break between the two sessions, also giving the opportunity to buy an HRUMC T-shirt. At the end of the conference, the participants were asked to return an evaluation form and were invited to come back next year.

The HRUMC was a valuable learning experience and a great time for all. Students and professors alike had the opportunity to present talks as equals.

The conference was a terrific success thanks to the financial support of the New York Cluster of the Pew Science Program in Undergraduate Education and Union College. Many heartfelt thanks go to the Steering Committee and to all the volunteers and participants who helped make it such a wonderful event. The Steering Committee consisted of William Zwicker, Joan Hart, Graham Bryce '98, and Laura Dalzell '98 from Union College; Emelie Kenney and Scott Vandenburg from Siena College; Susan Loepp from Williams College and David Vella from Skidmore College. The sixth HRUMC will take place in April 1999 at Siena College in Loudonville, NY. For more information, visit http://www.skidmore.edu/academics/mcs/hrumc/htm.

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAY

The Sonia Kovalevsky High School Mathematics Days below were funded by a grant awarded to AWM by the National Security Agency. Thanks, NSA!

Messiah College

Messiah College held its second annual Sonia Kovalevsky Day on Saturday, April 25, 1998, from 9:00 A.M. to 3:00 P.M. on the Messiah College campus. Three female teachers brought teams of students from Camp Hill High School, East Pennsboro High School, and Harrisburg High School. We were particularly excited to have two new schools join us this year.

Our theme for the day was "Mathematics Makes the Invisible Visible." Throughout the day, our college students showed the high school girls how mathematics can be used to understand and explain processes which seem mysterious. For instance, how do you control the descent of a parachute? How old is a dinosaur bone? How are movie images recorded on tape? Who will win the next election? All of these questions can be answered using mathematical principles. Each participant received a T-shirt which showed pictures representing these questions.

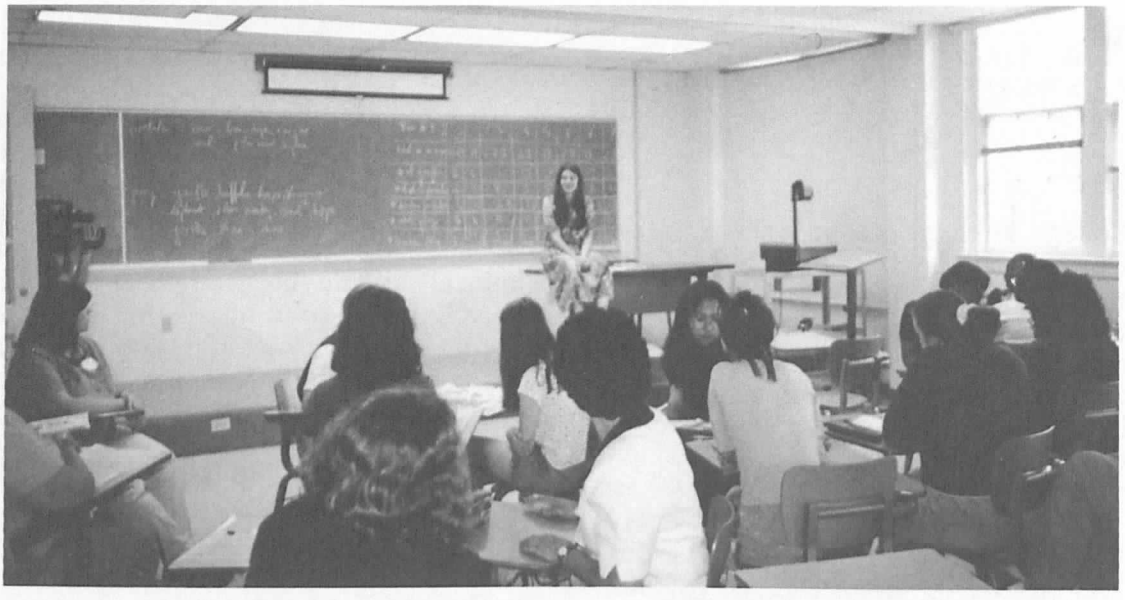
As the day began, Messiah College students and faculty welcomed the young women and their teachers, and continental breakfast was served. Students and teachers were given a folder containing a program for the day, promotional information about Messiah College, brochures from engineering and mathematics organizations, "I Love Math" stickers and pencils. One of the forms in the folder was an order form for a "Personalized Fractal." Students could choose two meaningful numbers, such as their birth date and social security number, and these were used as coefficients c and d in the complex equation $f(x)=z^2+c+di$ which is used in the design of Julia sets. Two of our computer science majors printed these fractal images on a color printer and returned them to the students by the end of the day. Some of the girls used them as a creative Mother's Day gift!

The program began with welcoming remarks and a discussion of the life and career of Sonia Kovalevsky led by one of our senior mathematics majors. Messiah College mathematics and secondary education majors led several interactive sessions during the day. In the first session, "Mathematics and Bubbles," students learned that bubbles do not always form the shapes that you might expect. When you dip a hollow cube in bubble solution, you do not end up with simply a "cubical" bubble. Instead, you see a cube within the cube. Bubble like to minimize surface tension, and they often do this with 120° angles. The second session was titled "Mathematics and Magic": several girls examined the properties of a Möbius strip for the first time, and learned that you can't win $20 by cutting it into two pieces! In the afternoon, the girls visited the workshop of our Flying Club, where they sat in the cockpit of a one-person plane and learned how trigonometry is used in navigation.

The final speaker of the day was Ramona Ranalli, a mathematician working at the National Security Agency. Ms. Ranalli did a wonderful job of describing her work and some of the simple ideas behind coding theory and cryptography. The girls were obviously interested in what she had to say, and they had many questions about her work. Other activities which the girls enjoyed included a problem-solving contest in the morning, complete with prizes, lunch at Wilbur's Cafe, and a tour of one of our student's dorm rooms. Our lunch break provided a valuable time for the students to socialize and meet students from other schools. Three of the girls were African-American students from Harrisburg High School, whose teacher reported that they rarely attended activities outside the city. It was exciting for them to see a glimpse of college life for the first time.

Although attendance was small for the second year, the Sonia Kovalevsky Day is a very valuable experience for the high school girls who attend, as well as for the college students who organize the event and participate. After two years of planning Sonia Kovalevsky Days, I have strong connections with teachers in six local high schools, including both rural and city schools. By hosting the event next fall (rather than spring), I hope to increase attendance, since our student teachers are in the schools in the fall and can recruit students. In the spring of next year, I plan to invite the girls to participate in our first summer mathematics camp in the summer of 1999. Sonia Kovalevsky Days

Angela Hare, Program Coordinator



Collecting data in the statistics workshop, MUW SKHS Mathematics Day

provide high school and college students with several valuable opportunities: to meet students with different abilities and backgrounds, to explore various areas in mathematics and science, and to consider mathematics and engineering as attractive career options. I am very grateful for the support of the AWM and NSA which makes Sonia Kovalevsky Day possible and allows me to build on the educational connections these days establish.

Mississippi University for Women

Mississippi University for Women hosted its first Sonia Kovalevsky High School Mathematics Day on March 28, 1998. It was attended by 18 high school girls and one teacher from four local high schools. Of the 18 students, seven were African-American and three were Asian-American. The organizers, panelists, and workshop leaders were all on the faculty of Mississippi University for Women or the Mississippi School for Mathematics and Science. We had prepared a workshop for teachers on mathematics resources on the internet but because there was only one teacher, we gave her the option of staying with the students throughout the program. She chose this option, so we just provided her with a list of the internet resources that had been compiled.

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

The group then began a discussion of careers in mathematics that was led by Dr. Shaochen Yang and Dr. Dorothy Kerzel of MUW. They talked about careers in mathematics as well as emphasized that there are many occupations that do not require a degree in mathematics, but where a strong mathematics background is a valuable asset.

After the discussion, the first of three workshops began, led by Dr. LeRoy Wenstrom of the Mississippi School for Mathematics and Science (MSMS). His workshop was centered around two VisualBasic programs. The first program, adapted from the article "Persian Recursion" by Anne Burns in the June

Jane Hurley Wenstrom, Mississippi University for Women, Division of Science and Mathematics

Mississippi University for Women SK Mathematics Day on March 28, 1998

1997 issue of *Mathematics Magazine*, illustrated the ideas of recursion and modular arithmetic to generate "mathematical" quilts. The second program, adapted from the article "Computing Bouts of the Prisoner's Dilemma" by Alun L. Lloyd in the June 1995 issue of *Scientific American*, allowed the students to see how an initial population of cooperators and defectors would evolve given a particular payoff.

After a buffet lunch in the President's Dining Room, the second workshop on elementary statistics began. It was led by Dr. Beate Zimmer of MUW, and she began by passing out boxes of animal crackers. She then proceeded to give a heuristic look at the variety of questions that could be answered using statistics. The group began by collecting data regarding the number of broken prey and predator animals in their boxes. The data was compiled and then the concept of hypothesis testing was discussed. Are more prey than predators broken in a random box of animal crackers? The group tried to answer the question using their own data, and then deeper questions were contemplated regarding appropriate sample size and so forth.

The final workshop on unit origami was led by Ms. Kathleen McGarvey of MSMS. She led the group through some basic geometry before discussing the creation of the unit origami pieces they would use to construct some three-dimensional models. At various stages of the construction, the group would answer questions regarding the geometry of the shapes they were creating. At the end of the workshop, each pair of participants had constructed a cube and a stellated octahedron.

The local newspaper, *The Commercial Dispatch*, ran a short article about the day and WCBI, the local CBS affiliate, sent a camera to capture some of the activity. They ran a story on that night's local news broadcast. Overall, the day was a definite success. The participants really enjoyed themselves. Their responses were very positive and emphasized how much fun they had with all of the hands-on activities. Thank you AWM for the support to run our first Sonia Kovalevsky High School Mathematics Day!

Clarion University of Pennsylvania

On May 15, 1998, a Sonia Kovalevsky Day honoring the first woman to receive the Ph.D. in mathematics and sponsored jointly by the Association for Women in Mathematics, the National Security Agency, and Clarion University was held at Peirce Science Center on the Clarion campus.

James J. Reynolds, Professor, Clarion University of Pennsylvania, Chair, Organizing Committee

Sixty-three high school women from ten of the predominantly rural school districts in Clarion, Venango, McKean and Warren Counties, eleven of their teachers, six Clarion University undergraduate women volunteers, seven professional women role models, an invited main speaker (Dr. Judy Holdener), at least seven of Clarion's mathematics faculty, and Clarion University's President participated in the day's events. The activities demonstrated that mathematics is fun, beautiful, applicable, and important to many careers. A continuing message was that persistence in mathematics, through high school and into post-secondary education, is essential to afford the broadest range of career opportunities.

At registration each participant received a Sonia Kovalevsky T-shirt commemorating the day and bearing her picture and a packet that included a brief biography of Sonia Kovalevsky and numerous materials that detailed the importance of mathematics preparation for various careers; each participating school district received a copy of the MAA publication *She Does Math*. The participants were officially welcomed by Dr. Diane Reinhard, President of Clarion University. Following this welcome the participants separated into four groups for the first two morning sessions. These sessions featured presentations that showed the diversity, applicability, and beauty of mathematics. They ranged from participatory discovery events to a motivational lecture. The speakers were all faculty members in the Mathematics Department of Clarion University: Dr. Karen Bolinger, "Weighing Objects in Space," a mathematical modeling exercise that sought to determine how to measure weight in the absence of gravity; Dr. James Reynolds, "Tracing Paths," a presentation that led the students to discover conditions for the existence of Euler paths and Euler circuits, understand the applicability of such paths, and a brief introduction to the traveling salesman problem; Dr. Glenn Rock, "The Dr. Deming Red Bead Experiment," as introduction to the role of mathematics in quality assessment of a manufacturing process; and Dr. Dip Bhattacharya (Dr. Dip), "A Journey to Truth, Goodness, and Beauty in Mathematics," a motivational presentation guaranteed to entertain students and excite them about mathematics for its own sake.

After the first two sessions all participants gathered for a panel discussion that featured seven professional women who spoke about the role of mathematics in their lives and in their careers. The discussion was moderated by Deb Freed, Project Director for New Choices, New Options, a state grant funded agency; the panelists were Ellen Krause, a vice-president at First Union Bank in Philadelphia; Dawn Groft, Purchasing Agent for Kahle's Kitchens; Colleen Deer, Pension Consultant, and Denise Yezek, Actuarial Analyst, both from Mockenhaupt Associates; Michelle Kaputa, owner of Michelle's, a small business in Clarion; and Pennsylvania State Senator Mary Jo White. The discussion ranged over the ways in which mathematics has influenced their careers in terms of its role in their daily work, the necessity for various career paths, and in some cases, the problems that lack of preparation had caused. One of the most telling comments was when Senator White said that as the State Legislature plans for 2000 and beyond, one of their greatest concerns is whether the work force will possess the requisite technical/mathematical preparation. The panel discussion generated much interest among the participants, with many lingering to speak individually to the panelists.

Following the panel discussion, the group gathered for lunch at Clarion University's Chandler Dining Hall. As everyone was finishing their lunch, Dr. Judy Holdener of Kenyon College gave a dynamic and fascinating talk entitled "Odd Shapes and Strange Surfaces." In this presentation, Dr. Holdener combined her love of and training in both mathematics and art and demonstrated some topological equivalences (such as a coffee cup and a donut). The presentation was lively and engaging, and after a few very nonintuitive equivalences were beautifully and clearly illustrated, she had completely captured the audience.

Following Dr. Holdener's presentation, everyone returned to the third session of presentations. Following this session each group had attended three of the four presentations, and each school district had some students at each presentation. There was a brief evaluation and then departure, as some school districts faced a return bus ride of up to one and one-half hours.

We are grateful to the Association for Women in Mathematics and the National Security Agency for their support and for the efforts of our organizing committee: Professors Ben Freed, Mike McConnell, Melanie Parker, Karen Bolinger, and Jim Reynolds, all of Clarion University's Mathematics Department, and, of course, Ms. Becky Silvis, the Mathematics Department Secretary, who brought it all together.

PROGRAMS FOR WOMEN IN MATH AT PURDUE

Tami Worner, Purdue University

Women in the School of Science at Purdue University in West Lafayette, Indiana are fortunate to have a variety of support programs from which to choose. In mathematics, there are programs for undergraduate, graduate and post-doc women which are sponsored by the School of Science. Two of these are the Women in Science Programs (WISP) and the Women in Science and Engineering Conference (WISE).

WISP began as a mentor/mentee program for graduate women in science and was initially sponsored by a grant from the Alfred P. Sloan Foundation. At the end of the term of the grant, the Dean of the School of Science decided the program should continue and be expanded to include a program for undergraduate women. The two programs are coordinated by Barb Clark, Director of Women in Science Programs, and two leadership teams, one of undergraduates and the other of graduate and post-doc women from the School of Science.

The goals of WISP include: expanding the overall proportion of women completing degrees in science at the B.S., M.S., and Ph.D. levels, increasing the interaction between women students and faculty members in science, and providing a method for more experienced students to support less experienced students. WISP also hopes their programs will enhance the self-esteem of women in the sciences and create an opportunity for an exchange of effective strategies for dealing with school and life.

WISP attempts to achieve these goals for graduate and post-doc women with a series of monthly programs. At the first meeting this past September, students and faculty were divided into mentor/mentee groups, the roles of mentors and mentees were discussed and some group activities were planned. Looking back, this was an important topic because it gave structure to the groups that was lacking in the past. The Mathematics and Statistics group is the largest it has ever been, with sixteen members. For our first activity, most of us got together to go to a movie. This may seem like a common activity, but it actually served several purposes: it allowed us to discuss our likes and dislikes when we were choosing which movie to see, and the new graduate students learned where the movie theater is (it's about six miles from campus!). We had a great time, and several of us went out for coffee and more socializing afterwards. From this, the new students formed relationships with the more senior students which have

Some women in the mathematical sciences, Purdue, May 1998

been useful throughout the year. They have someone to give them advice on taking their first exam, someone to complain to about homework, and someone to help out when they felt overwhelmed with their teaching and when they were wondering what classes to take in the spring.

Other monthly programs for the graduate women have focused on professional and self development. Topics have included grant writing, stress management, applying for positions in industry and academics, and international opportunities for women in science. We had a great program entitled "Being the Other: Challenges and Strategies," which talked about being a woman in a male-dominated world. Another program was on outreach activities, at which Sylvia Wiegand gave a great talk about the AWM and its activities. Our last program for the year was a panel of dual career couples who discussed the choices they have made and the trials and tribulations they have endured. This last meeting produced dialogue on the idea that you can have it all, but maybe not all at the same time, or when you want it exactly.

Freshmen women in science at Purdue have a unique opportunity to participate in a residential program. WISP reserves rooms in one of the residence halls to house a group of freshmen women. Tutoring and other special programs, including the Undergraduate Mentoring Program, are brought to the residence hall. Each freshman women in the program is matched with a more advanced student in the same major to provide a unique mentoring relationship. WISP provides monthly dinner programs which feature speakers talking on topics such as career options, time management, preparing for graduate school, campus safety and conflict management. An additional feature is the WISE Tutoring Program, in which upper-level honor students are trained to assist the beginning students by teaching them transferable skills which will aid them throughout their college career.

This April, there was another opportunity for the women in science and engineering at Purdue to enhance their professional development. In November, a group of female students from Purdue, together with Barb Clark and Jane Daniels, Director of Women in Engineering Programs, attended a CIC-WISE student leadership conference at the University of Illinois in Urbana-Champaign. This conference included undergraduate and graduate women from the Big Ten schools, along with the University of Chicago. Each school was then to conduct a similar program in the spring for their institution. Purdue's program was entitled "Investing in Your Tomorrow: Effective Strategies for Professional Development." The one-day workshop was open to all women in the Schools of Science and Engineering. It included sessions on professional and graduate school, sexual discrimination, conflict resolution, resume writing and interviewing, choosing a graduate advisor, obtaining research grants and applying for positions in academia. The conference was small but extremely successful. Participants appreciated the topics and the opportunity to meet other women in their fields and came away with very useful information and ideas.

For more information on any of the above programs, contact Barb Clark by email at clark@science.purdue.edu, or visit our home page at http://www.science.purdue.edu/WISP, which has links to many resources on the web for women in science.

ACTUARIAL SCIENCE: A GOOD CAREER FOR WOMEN

I earned my Fellowship in the Society of Actuaries (SOA) in 1963 — 35 years ago, when women were just breaking into professional and white-collar career fields. Since then, I have been able to serve the actuarial profession in many different roles, and I am proud that a number of women have earned leadership positions. I am the third woman to be president of the SOA, and a number of other women also have served on the SOA Board of Governors. About one-third of new actuaries are women, and today, women can compete on an equal basis for entry-, mid- and many senior-level positions in all types of actuarial employment.

The job of actuaries is to make financial sense of the future. The SOA mission statement says "The Society of Actuaries is an educational, research, and professional organization dedicated to serving the public and Society members. Its mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business, and

Anna M. Rappaport, FSA (Fellow, Society of Actuaries); President, Society of Actuaries

societal problems involving uncertain future events. The vision of the Society of Actuaries is for actuaries to be recognized as the leading professionals in the modeling and management of financial risk and contingent events."

Traditionally, most actuaries have been employed by insurance companies, pension funds, health organizations, and consulting firms or by insurers and other organizations with a need to determine property and casualty (P&C) risks. [Actuaries doing P&C work often belong to the Casualty Actuarial Society (CAS).] The methods and the mathematics actuaries use are applied to other business problems as well, such as asset-liability management. Most SOA members are employed in the United States and Canada, but about 10 percent reside in other countries, with a strong representation in eastern Asia.

Actuaries are very important to society, and their importance is likely to increase. One reason is the aging of the population in the United States and in other countries as well. Actuaries provide analyses that help a government determine whether its social security system is sound and what level of financing is needed to fund benefits, and they help businesses design and manage pension systems and health benefits. Other trends also bode well for increasing the value of actuarial work, such as the emergence of new financial instruments and their impact on investment management. And of course, insurers always will need to determine the proper level of reserves necessary to protect policy holder interests and remain profitable.

The employment outlook for actuaries is strong and salaries are good. To qualify as an actuary, candidates must study actuarial mathematics and pass examinations sponsored by the SOA or the CAS. Many North American universities offer actuarial science programs at the undergraduate or graduate level.

The SOA education and examination program emphasizes actuarial mathematics and some common applications. However, it is important in this profession, as in all professions today, to be well rounded. Good communication skills and business sense are crucial. Computer skills are also important.

Are there any barriers for women in the actuarial profession? Unfortunately, glass ceilings still exist in this field as in all others. Whether they are present depends on the culture in each organization. However, because of the stringent qualification requirements and the credibility that goes with them, female actuaries often can rise higher and faster than their counterparts in other fields. I encourage women to pursue actuarial careers.

A brochure published by the SOA, "Actuaries Make a Difference," presents the many facets of actuarial careers. *The Actuary's Career Planner*, a book published by the SOA, helps both new and experienced actuaries assess their skills and plan their life steps. These publications are available from the Society; the brochure is free, and the *Career Planner* is $39. Contact the Society of Actuaries, 475 North Martingale Road, Schaumburg, IL 60173-2226, 847/706-3500. Also, information on the actuarial profession and the SOA's education and examination system is available on the SOA's Web page at www.soa.org.

FEDERAL SCIENCE SUPPORT

For the science, engineering, and university community, the start of the year had Gingrich and Clinton in a game of dueling press releases expressing their affection for R&D ... both the Republicans and the Democrats) [put] R&D as a priority. The Senate "Double R&D funding in a Decade" effort was well underway. The President's budget tried to claim the high ground with increased funding and, for the first time in a long time, science was mentioned throughout the State of the Union address.

Fast forward to today. House and Senate budgets show no increase for science and the leadership refuses to lift the spending caps despite the first budget surplus in nearly 30 years. The highway bill eats up scarce domestic spending dollars. The appropriations allocations in the Senate show small NIH increases and flat NSF funding. NASA gets cut, as does DOE. Sen. Domenici, the chair of the Senate Budget committee (he of the Double-in-a-Decade group, he of the flat Senate Budget) states, "there is no way" the Senate can pass Labor-HHS and VA-HUD (where NSF resides) based upon (low) Senate appropriations numbers or the Kasich

Skip Stiles, Democratic Legislative Director, House Committee on Science, 822 OHOB, Washington, DC 20515, committee: http://www.house.gov/science_democrats

budget. House Appropriators for science programs foretell similar freezes and cuts.

Finger pointing and accusations fly as Senate supporters of the Doubling proposal seek greater effort from science and university groups. Science and university groups accuse the White House of not backing the Doubling effort. The White House wonders where the science and university community was during the budget and early appropriations process after the President set things up for healthy gains with his budget and State of the Union. Everyone wonders how opportunity was squandered on the budget and looks for someone to blame. Unity seems as thin as the paper the last press release was printed upon as individual institutions and disciplines break ranks to protect their interests within the diminished pot of federal money — the old fashioned way.

Science and university groups are a no show at the great American smoke-in to divvy up tobacco money. Likewise, serious threats to research access to data bases pass the House and the Senate without resistance as the science and university community don't show up....

The continual "no-show" pattern compromises the effectiveness of the science and university community. Interest group politics is about making it easier for a politician to take a tough vote you want and making them know your displeasure if they don't. So far there is absolutely no risk to ignoring the needs of the science and university community, a fact borne out last month during the Senate budget process and more recently during Congressional debates on the data base issues.

There are bills in the House and Senate that, according to letters sent by scientific organizations, universities, and others, would gravely disrupt access to large science data bases. In gross terms, these bills could limit research access to previously available data bases, possibly allow copyright coverage of large, pubic data bases, and place liability on institutions for their misuse/misappropriation. Imagine not getting access to large epidemiological data bases or having to pay per bit of information for large historical data compilations.

Yet the Senate bill passed 99–0. In the House, HR 2652 was the subject of numerous letters of opposition, but it was mostly up to university research librarians to make a direct effort to stop the bill. After much mail had been sent by universities and scientific and technological organizations, only one Member of Congress showed up on the floor to oppose the bill. Yes, it was our very own Rep. George E. Brown, Jr., the poster child of lost science policy causes.... He was told by Judiciary Committee members that they did not know of problems with the bill and that the committee fixed the ones raised earlier. With only Brown's solitary presence on the House floor a vote was not deemed wise and the bill passed the House by *voice vote*!

LETTER TO THE PRESIDENT

Dear Mr. President:

As leaders of professional organizations representing more than 3.5 million scientists, engineers and mathematicians, we applaud your commitment to investing in the future of our country. We commend you, particularly, for recognizing that as the 20th century draws to a close, the various disciplines of science and engineering have become ever increasingly dependent.

In your State of the Union Address, in your speech before the American Association for the Advancement of Science and in your budget request, you proposed the formation of an interdisciplinary 21st Century Research Fund within the existing federal budget to focus the nation's attention on science and technology. Your proposal represents an important step in realizing the scientific, biomedical and technological possibilities of the next millennium. The investment can be a legacy for the health, security, education, welfare of the American people.

We urge you to continue to work with the bipartisan coalition of Senators and Representatives who have been advocating federal investments in science and engineering research. We hope that your joint efforts will succeed in providing the funding to realize this goal.

We share your vision of a future where the benefits of science and engineering better the lives of all Americans. We accept the challenge to make this vision a reality, and commit ourselves to the American people with vigilance and concern.

dated June 8, 1998 and signed by heads of 35 professional organizations, including the Association for Women in Mathematics and the American Mathematical Society

H.R. 3007

The House Science Subcommittee on Technology passed H.R. 3007, the Advancement of Women in Science, Engineering, and Technology Development Act by voice vote on March 26, 1998. Introduced by Rep. Connie Morella (R-MD), the bill would establish a commission to study the barriers that women face in science, engineering, and technology. The commission will investigate the numbers of women in these fields to determine the specific areas in which they are underrepresented. The commission would also investigate the employment practices for women in these areas and compare them to those for their male counterparts. Finally, the commission would issue recommendations to the government, academia, and private industry. The Commission will include the directors of most federal science agencies. The bill would also direct the National Science Foundation (NSF) to study the educational opportunities available to women who want to enter the fields of science, math, and engineering to issue recommendations to Congress on ways to improve educational opportunities for women.

In her opening statement at joint hearings on the bill, Rep. Morella explained that "significant progress has been made in integrating women into the scientific and engineering fields ... but overall the numbers are still low." She stated that the percentage of women engineers in the workforce is still under 10 percent, and the number of female computer science Ph.D.'s has never risen above 17 percent. She also noted that women are not evenly distributed through the scientific workforce. For example, women account for more than half of the sociologists and psychologists, but only nine percent of the physicists. Morella spoke about the "significant shortfall of high-tech trained workers" and "the fact that women are entering these professions at rates well below those of men mean that we are losing an enormous labor-pool, which could contribute greatly to addressing the information technology labor shortage." Morella expressed her hope that H.R. 3007 would not only aid the high-tech economy but also help women break through the "Glass Ceiling" and the "Silicon Ceiling." A summary of the hearing is available on the AGI website www.agiweb.org, and the full written statements of the witnesses are available from the House Science Committee website http://www.house.gov/science/hearing.htm.

H.R. 3007 has been endorsed by the American Association of Engineering Societies, American Chemical Society, and the Institute of Electrical and Electronic Engineers — USA.

from a report by Kasey Shewey, AGI Government Affairs Program

BREADWINNER WIVES

According to a 1996 report by the U.S. Bureau of the Census, 29% of all married women who work have incomes that exceed their husbands'. Randi Minetor is conducting research on this phenomenon for a book she is writing, tentatively titled *Breadwinner Wives*. She is looking for volunteer couples to be interviewed by telephone. To qualify, the couple must be married and live in the continental U.S., the wife's income should exceed the husband's by at least 30%, and the couple should be participating in the arrangement by choice, even if it began by layoff or other misfortune. If you would like to volunteer, call Randi Minetor, 1-800-203-9912, PIN #7162 or email bittern@frontiernet.net by **July 30, 1998.**

MSRI 1998–1999

The Mathematical Sciences Research Institute has a full calendar of special events for the coming academic year. They are: Solving Systems of Equations, September 9–14; Mathematics and Media, October 8–10; Symbolic Computation in Geometry and Analysis, October 12–16; Complexity of Continuous and Algebraic Mathematics, November 2–6; Random Matrices, Statistical Mechanics, and Integrable Systems, February 22–26; and Random Matrices and Their Applications: Quantum Chaos, GUE Conjecture for Zeros of Zeta Functions, Combinatorics, and All That, June 7–11. Two introductory workshops will also be held. For further information, write MSRI, 1000 Centennial Drive, Berkeley, CA 94720 or see http://www.msri.org.

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND POSTDOCTORAL MATHEMATICIANS

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

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

WHEN: The next AWM Workshop will be held in conjunction with the annual Joint Mathematics Meetings in San Antonio, Texas, January 13–16, 1999. The Workshop will be held on Saturday, January 16, 1999 with an introductory dinner for participants on Thursday evening, January 14, 1999.

WORKSHOP: Twenty women will be selected in advance of the workshop to present their work; the selected graduate students will present posters and the postdocs will give twenty-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 postdocs who do not receive funding to obtain some institutional support to attend the workshop 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 toward their theses and from women who have received their Ph.D.'s within approximately the last five years. The word "postdoc" refers to recent Ph.D.'s whether or not they currently hold a postdoctoral or other academic position. Women with grants or other sources of support are still welcome to apply. All non-U.S. citizen applicants must have a current U.S. address. All applications should include a curriculum vitae, a concise description of research (two to three pages), and a title for the proposed talk/poster. All applications should also include at least one letter of recommendation; in particular, a graduate student should include a letter of recommendation from her thesis advisor. Nominations by other mathematicians (along with the information described above) are also welcome.

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

(Applications via email or fax will not be accepted.)

APPLICATION DEADLINE: Applications must be received by **September 1, 1998.**

AWM WORKSHOP FOR WOMEN GRADUATE STUDENTS AND POSTDOCTORAL MATHEMATICIANS

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

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

WHEN: An AWM Workshop will be held in conjunction with the 1999 SIAM Annual Meeting (May 12–15, 1999) and the sixth SIAM Conference on Optimization (May 10–12, 1999) at the Radisson Atlanta Hotel, Atlanta, Georgia. This Workshop is *tentatively* planned to be held on Friday, May 14 and Saturday, May 15 with an introductory group discussion and dinner on Thursday evening, May 13.

WORKSHOP: The workshop will consist of a poster session by graduate students, two to four minisymposia, and a dinner with a keynote speaker. The graduate student poster sessions include all areas of research in applied mathematics. Each minisymposium will have a definite focus. The first minisymposium will be informational, directed at starting a career. The remaining minisymposia will be selected from the research areas of mathematical biology, control, optimization, modeling, and PDE's and applications.

Selected graduate student participants will present their research in a poster session. Selected postdocs (those within five years of their Ph.D.) will speak in one of the three AWM research minisymposia. AWM will offer funding for travel and two days subsistence for up to twenty participants. Departments are urged to help graduate students and postdocs obtain some supplementary institutional support to attend the Workshop and the associated meeting. All mathematicians (female and male) are invited to attend the entire program.

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

APPLICATIONS: To be eligible for funding, *graduate students* must have begun work on a thesis problem. Applications should include a cover letter, a summary of the work (one to two pages), a title for the proposed poster, a curriculum vitae, and a supporting letter of recommendation from a faculty member or research mathematician. Applications from *postdocs* should include a cover letter, a title and abstract (75 words or less) of the talk to be given if accepted, a summary of the work (one to two pages), a curriculum vitae, and (if desired) a letter of recommendation. The word "postdoc" refers to any mathematician who has received her Ph.D. within the last five years, whether or not she currently holds a postdoctoral or other academic position. All funded participants are invited and strongly encouraged to attend the full two-day AWM program. All non-U.S. citizen applicants must have a current U.S. address.

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

(Applications via email or fax will not be accepted.)

APPLICATION DEADLINE: Applications must be received by **January 4, 1999.**

ON THE WEB

The xxx math e-print archive

The xxx math e-print archive is a new service which may be explored at the UC Davis front end at http://front.math.ucdavis.edu or directly at Los Alamos at http://xxx.lanl.gov.

xxx has a full-time staff and is funded by DOE and NSF. The xxx archives have over 60,000 e-prints in physics, accruing at a rate of 20,000 per year. The mathematics areas of algebraic geometry, differential geometry, quantum algebra, and functional analysis have also been archived for several years and now have over 3,500 e-prints. Recently, the math archive was expanded to include all areas of mathematics. A committee of mathematicians was formed by Dave Morrison to steer this expansion; the committee has persuaded at least five non-xxx mathematical archives (SCV, MAGNUS, Banach, Logic E-prints, and LACES) to merge with xxx to form the new unified math archive.

The committee invites you to submit e-prints to all categories of the math archive. The archive offers automatic TeX compilation, a worldwide mirror network, and daily email bulletins. Above all, it offers valuable visibility for your work. (Many faculty members search for the work of job applicants in MathSciNet or xxx, because these services are always available.) Clear step-by-step submission instructions are available at http://front.math.ucdavis.edu/submissions.html.

Math and science career information

The site http://www.phds.org, an online library full of useful information for math grad students and postdocs, is set up as a "Yahoo!"-like archive of math and science career information. The site has pointers to online articles, essays, databases, and books on finding academic employment, on sources of funding, on careers outside of the academy, on teaching, on surviving grad school, and on research for undergraduates. There is a growing collection of articles, essays, and speeches on the job market and statistics on the prospects for Ph.D.'s. For example, Richard Holmes, a mathematician who now runs an investment services company, has written a useful article for mathematicians thinking about working in finance, "Opportunities for Mathematicians in Finance and Investments" (http://www.phds.org/jobs/Reading/investment.htm). There is also a collection of information on the adjunctification of academia and the movement for tenure reform. The site is maintained by students at Dartmouth College and is made possible by the generous support of the Alfred P. Sloan Foundation.

AMS Library Committee listserver

The AMS Library Committee has a new listserv which is dedicated to informing mathematicians on library issues and discussing common problems. The general purpose of the Committee, which has both mathematicians and librarians as members, is to improve communication between librarians and mathematicians. To post to the list, email mathlib@archives.math.utk.edu. To subscribe, send mail to majordomo@archives.math.utk.edu. In the mail message, enter only the words subscribe mathlib. Archives are available at http://archives.math.utk.edu/hypermail/mathlib.

Rob Kirby's Critique of Journal Publishers

In a recent letter to a publisher, Rob Kirby, UC Berkeley, states:

> During the past year I have been gathering information, thinking, and writing about the high cost of commercial math journals and alternative methods of publication....
>
> What I would like to see happen, and is beginning to happen, is the following: there would exist preprint servers in each subfield of mathematics (a subfield being two to five percent of math, defined in a natural way, for example mine would be low dimensional topology). Once an author has produced a suitable TEX version of a paper, s/he would send it to one or more preprint servers which would list the paper on-line for eternity. I could go to a server that interested me and ask for a specific paper, or all papers by a certain author, or all papers in a certain subject since a certain date, or all papers with certain code words; I might have a subscription which sends me an abstract each time a paper is listed.
>
> Such a system has the following advantages: (1) assuming almost all mathematicians join this system, I have quick and efficient access to papers that interest me, which I can peruse on my computer screen and print if I wish (contrast this with waiting for publication and then hoping my library subscribes so that I can laboriously xerox

page by page); (2) I can easily distribute my own papers to any interested reader (contrast this with duplicating a paper preprint, stuffing envelopes and addressing, and then missing part of my interested audience)....

It is still vitally important, in my opinion, that we mathematicians retain our tradition of having papers refereed and accepted (or rejected) by journals of varying reputation. This should continue, and can also be done electronically. We have started an electronic journal, *Geometry & Topology*, based at the University of Warwick (see http://www.maths.warwick.ac.uk/gt/). It is free, at least in the foreseeable future. It is off to an excellent start with a large distinguished board of editors and standards at least that of *Topology*. We expect to offer a paper subscription at a very low price, determined by the cost of a commercial printer using our TEX files. Of course, there are the hidden subsidies to *G&T* by Warwick, such as supporting the computers that *G&T* uses and some time by the editors....

Last spring, I collected some data on prices of journals which can be found at http://math.berkeley.edu/~kirby/journals.html in the appendices. The data is given in price per page and price per 10,000 characters. The latter is more accurate, but the former is easier to understand. Briefly, an efficient and cost conscious journal like the *Pacific Journal of Math* can be sold at about 13 cents/page. It is a non-profit company, with only minor subsidies from a few universities, and a 40+ year history of low costs and good mathematics.

Springer averages 82 cents/page, Academic Press 40 cents/page, and Birkhauser 68 cents/page, for comparison. The non-profits are usually less.

Panel Report on State of U.S. Mathematics

A panel commissioned by the National Science Foundation's Division of Mathematical Sciences reports that several adverse trends threaten to undermine the United States' dominant position in world mathematics. The panel also notes that NSF policies significantly affect the strength of U.S. mathematics and hence the health of other sciences.

The "Report of the Senior Assessment Panel for the International Assessment of the U.S. Mathematical Sciences" is NSF's first such international "benchmarking" or evaluation of any scientific field. Chaired by retired Lieutenant General William E. Odom, former head of the National Security Agency, the assessment committee consisted of mathematicians from Europe, Asia and Canada as well as from U.S. national laboratories, industry and elsewhere. NSF grantees were specifically excluded from the panel. The just-published report is part of NSF's response to the Government Performance and Results Act and contains recommendations for how NSF should support mathematics.

The panel recommends that the U.S. work to retain world leadership in "critical subfields" of mathematics. Federal support for mathematics — except for that provided by NSF — is falling rapidly, according to the panel, so NSF bears a special responsibility for the future of mathematics in the United States.

The panel suggests that NSF work to broaden education in undergraduate and graduate mathematics, increase support for graduate and postdoctoral study in mathematics, strengthen interaction between creators and users of mathematics, and generally work to sustain current U.S. world leadership. Other recent studies have addressed the importance of mathematics in K–12 education; the assessment panel chose not to address this issue.

For a copy of the report, NSF 98-95, see http://www.nsf.gov/cgi-bin/getpub?nsf9895.

Subject: SIAM Journal Alerting Service

SIAM is pleased to announce an alerting service to let our readers know when new papers are posted electronically as part of SIAM Journals Online.

SIAM has switched to a paper-by-paper publication process. This means that when a paper has completed the production process, it is immediately posted electronically to SIAM Journals Online and can be viewed by subscribers. Under the old production process, entire issues were posted approximately four weeks prior to the mail date of the bound journal. Because there is now no set schedule for when the papers will be published electronically, it will be difficult for our readers to determine which papers are new. Our Journal Alerting Service will allow you to keep informed about newly posted papers that may be of interest to you. Even if you do not currently subscribe to a SIAM journal, the alerting service may be of value to you in keeping abreast of what is being published.

If you decide to sign up for this service, you will receive an email that lists journal, issue, title, authors, and URL for all papers posted to SIAM

Journals Online. To limit the size and frequency of these email messages, they will be sent no more than once a week. Please note that this is not a discussion list. You will receive only the weekly updates listing the new article postings.

To subscribe to this list, visit http://epubs.siam.org. If you are not currently a subscriber to SIAM's electronic journals, please contact service@siam.org for additional information on subscribing, or see SIAM's Home Page at http://www.siam.org.

Numerical Recipes Home Page

Software for wavelets and image processing may be found in the public-domain area of Numerical Recipes at http://nr.harvard.edu/nr/public-domain.html. Dhavide Aruliah last year reported to me:

> Along with the software are two test images, presumably for users to verify the software after downloading. One of the images, called cheesecake.gif, depicts a female model in a swimsuit (I admit that I downloaded the image, naively hoping that there was a clever pun involving an image of an actual dessert).

A ridiculous disclaimer was posted on the page. Aruliah sent a letter of complaint to the site.

Aruliah's message to me stayed in my "to-do" pile longer than I would have liked. In the spring I found the time to visit the site and was pleased to see that cheesecake.gif has disappeared, replaced by a 40's photo of a young woman's face. Good work, Dhavide.

E-MATH Site Updated

The AMS has reorganized and redesigned e-MATH by adding search capability, improved navigability and "AMS Updates," a dynamic area of news items of interest to mathematicians, other scientists, librarians and the general public. e-MATH, the AMS web site at www.ams.org, provides a wealth of information in the mathematical sciences for researchers, students, applied mathematicians, educators — anyone involved in mathematics.

The first four subsections of this article are based on items found in the *Concerns of Young Mathematicians* newsletter.

Canadian Mathematical Society Women: Lynne Batten, Kathy Heinrich, Jennifer Hyndman, Karen Seyffarth, and Gail Wolkowicz

ADVERTISEMENTS

BROWN UNIVERSITY - DEPARTMENT OF MATHEMATICS - One professorship at the Associate Professor level, with tenure to begin July 1, 1999. Preference to be given to applicants with research interests consonant with those of the present members of the Department. We are especially looking for candidates in the general area of analysis, but exceptional candidates in all fields will be seriously considered. Candidates should have a distinguished research record and a strong commitment to undergraduate and graduate teaching. Qualified individuals are invited to send a vitae and arrange for at least five letters of recommendation to be forwarded to: **Senior Search Committee, Department of Mathematics, Box 1917, Brown University, Providence, Rhode Island 02912.** Applications must be received by November 9, 1998, in order to receive consideration. Email inquiries can be addressed to srsearch@math.brown.edu. Brown University is an Equal Opportunity/Affirmative Action employer and encourages applications from women and minorities.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Postdoctoral Positions - J.L. Doob Research Assistant Professor - The Department of Mathematics of the University of Illinois at Urbana-Champaign is soliciting applications for postdoctoral positions. Two appointments will be made starting August 21, 1999; each appointment is for 3 years and is not renewable. These positions are for recent Ph.D. recipients (with a strong preference for those not more than one year past the Ph.D. degree). The Department of Mathematics will provide an excellent scientific environment to pursue research in pure and applied mathematics. The position carries a salary of $40,000 per year. Applicants should send a letter of application, a curriculum vitae and publication list, and arrange to have three letters of reference sent directly to the address below. It is the responsibility of the applicants to make sure that letters of recommendation are sent. Send to: **Postdoctoral Search Committee, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801-2975.** e-mail: postdocs@math.uiuc.edu. To insure full consideration, all materials, including letters of reference, should be received by December 1, 1998. We will review later applications, until the search is closed. We encourage use of the application *cover sheet* provided by the American Mathematical Society and the indication of the subject area using the AMS subject classification numbers. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Tenured Position - Applications are invited for one or more full time tenured faculty positions to commence August 21, 1999. Those faculty will be expected to pursue an outstanding research program, and teach graduate students as well as undergraduate students. The department will consider applicants in all fields of mathematics, but we intend to show preference in applied mathematics, partial differential equations and global analysis, number theory, algebraic geometry, combinatorics, computational mathematics, and probability theory. Salary and teaching load are competitive. Applicants are expected to have a Ph.D. and a documented record of leadership in research as well as of excellence in teaching. Applicants should send a curriculum vitae, a list of publications, a few selected reprints or preprints, and the names and addresses of three references to the address below. The department will solicit letters for the finalists for the tenured positions. Send to: **Philippe Tondeur, Chair, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801.** Tel (217) 333-3352, e-mail tenure@math.uiuc.edu. We anticipate an on-going search but will begin considering applications and conducting interviews on October 5, 1998. We encourage use of the application *cover sheet* provided by the American Mathematical Society and the indication of the subject area using the AMS subject classification numbers. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN - DEPARTMENT OF MATHEMATICS - Tenure-Track Position - Applications are invited for one or more full time faculty positions to commence August 21, 1999, at the tenure-track (assistant Professor) level. Those faculty will be expected to pursue a vigorous research program, and teach graduate as well as undergraduate students. The department will consider applicants in all fields of mathematics, but we intend to show preference in applied mathematics, partial differential equations and global analysis, number theory, algebraic geometry, combinatorics, computational mathematics, and probability theory. Salary and teaching load are competitive. Applicants should have completed the Ph.D. (or equivalent) by the time the appointment begins and are expected to present evidence of excellence in research and teaching. Applicants should send a letter of applications, a curriculum vitae and publication list, and also arrange to have three letters of reference sent directly to the address below. It is the responsibility of the tenure-track applicants to make sure that letters of recommendation are sent. Send to: **Philippe Tondeur, Chair, Department of Mathematics, University of Illinois at Urbana-Champaign, 1409 West Green Street, Urbana, IL 61801.** e-mail: search@math.uiuc.edu. For fullest consideration, all materials, including letters of reference, should be received by December 1, 1998; however, applications will be accepted, and interviews conducted, until the positions are filled. We encourage use of the application *cover sheet* provided by the American Mathematical Society. Applications from women and minority candidates are especially encouraged. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

UNIVERSITY OF WISCONSIN MEDICAL SCHOOL - DEPARTMENT OF PREVENTIVE MEDICINE AND BIOSTATISTICS - The Departments of Preventive Medicine and Biostatistics, University of Wisconsin Medical School are seeking to fill a joint tenure track position at the assistant professor level for a biostatistician with interest and experience in the design and analysis of observational studies. Teaching responsibilities: teaching a course in the statistics core sequence and advising students in an M.S./Ph.D. program in Population Health with tracks in both epidemiology and health services research and some participation in the training of biostatistics graduate students. Research will involve both independent statistical methodologic investigation and collaboration with other investigators in epidemiological and health services research. Submit CV and letter describing research and teaching interests to: **Donn D'Alessio, M.D., Chair, Department of Preventive Medicine, University of Wisconsin-Madison, 504 N. Walnut Street, Madison, WI 53705-2368.** UW-Madison is an EEO-AA employer. Unless confidentiality is requested in writing, information regarding the applicants must be released upon request. Finalists cannot be guaranteed confidentiality.

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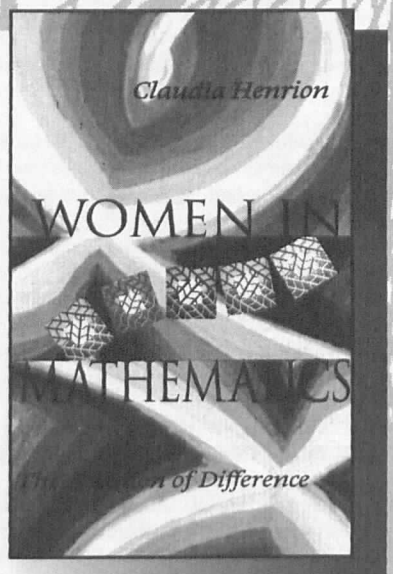

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AWM

Newsletter Volume 28, Number 4, July–August 1998

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