## PRESIDENT'S REPORT

I am delighted to announce the winners of the first Alice T. Schafer Undergraduate Prize in mathematics — Linda Green (University of Chicago) and Elizabeth Wilmer (Harvard University). The qualifications of these two young women were so outstanding that the prize committee could not choose between them and asked if they could award two prizes instead of one. In addition, there will be 10 honorable mentions awarded. We received a total of 43 nominations from institutions throughout the United States. Linda and Elizabeth have been invited to attend the AWM activities at the August Joint Meeting in Columbus, where the official prize ceremony will take place during our business meeting. I hope all of you will be there to meet them; they represent the best of the next generation of women in mathematics. Elsewhere in the newsletter is a report on all of the winners.

AWM will be one of the co-sponsors for a national two-day conference in April, 1991 on "Expanding the Vision of Opportunity in Science, Engineering, and Mathematics." The conference is being organized and run by the American Water Works Association. We have been asked to recommend speakers and to help publicize the meeting.

Meanwhile we are busily at work organizing various activities of our own. A proposal modeled on the successful luncheon we held in Boulder and a similar program run by Lynne Billard for young women statisticians will soon go in to NSF to fund AWM sponsored workshops for graduate students and recent postdocs. The workshops would be held in conjunction with AMS/MAA Joint Meetings and the SIAM National Meeting. We hope to get funding in time to run the first workshop at the January 1991 meeting, where we will celebrate the 20th anniversary of AWM.

The program committee for the special session "The future of women in mathematics," to be held during our 20th anniversary celebration, has been hard at work. During the course of our deliberations we have been gathering a list of outstanding women mathematicians within 10 years of their Ph.D. degree, and the results are really exhilarating.

It occurs to me that we are so often focusing on the work we still need to do that we don't have the opportunity to reflect on the success we have had in increasing the pool of talented women doing mathematics. Everyone on the program committee has commented how encouraging the exercise has been of gathering these names, watching the list grow, and realizing how many young talented women mathematicians there are.

Finally, I am pleased to report that Sue Geller has been appointed by the executive committee to fill the vacancy left by Carol Wood, who has given up her membership-at-large to serve as president-elect. Sue, who is the current chair of the Joint Committee on Women, will serve out the remainder of Carol's term.

Jill Mesirov
Thinking Machines Corporation
245 First Street
Cambridge, MA 02142
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# ALICE T. SCHAFER MATHEMATICS PRIZE WINNERS

AWM Announces Schafer Prize Winners!

Linda Green, a senior at the University of Chicago and Elizabeth Wilmer, a junior at Harvard University, were selected to share the first annual Alice T. Schafer Mathematics Prize sponsored by the Association for Women in Mathematics (AWM). Each will receive a check for $1000. The prize is given to an undergraduate woman in recognition of excellence in mathematics. The criteria for selection include, but are not limited to, the quality of the nominee's performance in mathematics courses and special programs, an exhibition of real interest in mathematics, the ability to do independent work, and performance in mathematical competitions (if any). The prize is named for Alice T. Schafer, both a former president and a founding member of AWM, who has done so much for women in mathematics throughout her career.

The task of choosing a winner was a difficult one for the Prize Committee, which consisted of Lenore Blum, Alice Schafer, and Bhama Srinivasan. In addition to Green and Wilmer, the committee awarded ten Honorable Mentions and specially recognized one first-year student. According to Blum, who chaired the committee, the large response to the prize was gratifying and the quality of the nominations was outstanding. Forty-three mathematics majors representing forty different institutions from all parts of the United States were nominated. The institutions were of all types: four-year liberal arts colleges, community colleges, and large and small universities. It is a tribute to all of the young women who were nominated that they were recognized by their faculty for such an honor. As AWM President, Jill Mesirov, stated in her letters of congratulations, "We are proud of you. You represent the best of the next generation of women in mathematics."



Linda Green

Linda Green was described as one of the top undergraduates in the Mathematics Department at Chicago in the last twenty-five years. She began taking graduate courses as a sophomore and has uniformly excelled in them. She also took the Putnam exam in her sophomore year, finishing in the top 100. In the summer of 1989, she participated in an NSF sponsored Research Experience at Chicago studying harmonic analysis on local fields; her work was considered to be outstanding. Green has also, in conjunction with this NSF program, served as a counselor in the Mathematics Department's program for mathematically talented students from the Chicago Public Schools. Paul Sally, in his letter nominating her for the prize, said, "Linda Green is a truly impressive young woman who has all the talent and drive necessary to become an outstanding mathematician...".

Being the first to win a mathematics prize is not a new experience to Elizabeth Wilmer; she was a major force behind the Harvard undergraduate math team which won the first SIAM mathematical modeling competition last year. She already showed great promise in high school when she came in second nationally in the Westinghouse Science Competition with a graph theory project and placed seventh on the American Olympiad team. Wilmer spent Fall Semester 1989 taking courses in Budapest, where she was considered to be exceptionally talented. She also worked last summer at the NSF-REU program at the University of Minnesota – Duluth and was asked to return. At Harvard, she has taken several graduate courses and has served as an undergraduate teaching assistant. "She is one of our real super-stars, who seems destined for a distinguished research career," said Benedict Gross in his nomination letter.
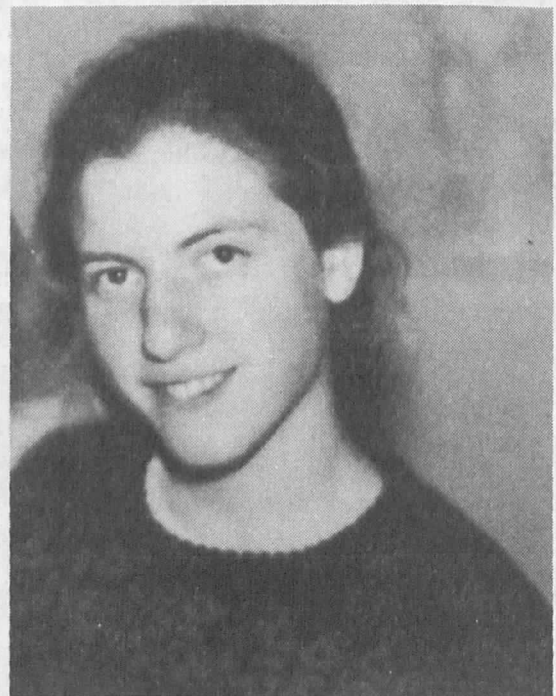
AWM is also pleased to recognize 10 outstanding women who were nominated for the Schafer Prize and given Honorable Mention in the competition:

Jennifer Beineke, a junior at Purdue University, was nominated for her outstanding performance in high-level mathematics courses as well as her participation in an undergraduate research program at Memphis State University last summer.

Urmi Bhattacharya is a senior at Indiana University and a member of Phi Beta Kappa. She will be receiving an honors B.A. in mathematics and a B.A. in computer science in May.

Hope Concannon, a senior mathematics major at Valparaiso University, has been a recipient of the Valparaiso University Presidential Scholarship for academics for each of her four undergraduate years.

Colleen Gallagher is a junior at the University of Dayton majoring in both mathematics and English. As a sophomore, Gallagher was in the top two of the nine Putnam competitors from the University of Dayton.

Lela Hill is a sophomore at California State University – Dominguez Hills who was nominated for exceptional performance in mathematics courses and what the nominating faculty consider her "tremendous motivation and talent."

Judy Leavitt is a mathematics major at the University of Michigan who has done a summer research program on group theory and hopes to publish the results.

Jennifer McLean is a senior at the University of Colorado at Boulder with "an unmatched record among mathematics majors. She is expected to graduate first in her class in the mathematics program."

Jeanne Nielson is an outstanding mathematics major at Duke University, rated by her professors as one of the best in the department in the last twenty-five years.

Natalie Thurman was the mathematics department's unanimous choice as the nominee from Southwest Missouri University. Thurman is a senior who has received top scores on the first two actuarial exams.

Ileana Vasu, a senior at Stanford University, is described as a "highly talented student of mathematics with an unusual level of determination and perseverance."



Elizabeth Wilmer

In addition, Julie B. Kerr, a freshman at Washington State University, is given special recognition by the Prize Committee because of her outstanding achievements in mathematics so early in her career. She was one of 24 students qualifying nationwide to train for the Olympiad and is currently enrolled in graduate level courses.

Because this is the first year in which the prize will be awarded, AWM is planning a special award ceremony at the AWM Business Meeting on Thursday morning, August 9, 1990 during the Joint Mathematics Meeting in Columbus, Ohio. The timing is appropriate, since the MAA will be celebrating its 75th Anniversary, and there will be an emphasis on undergraduate mathematics education.

The prize is funded by an endowment with the initial contributions coming from the AWM, the American Mathematical Society, and the Mathematical Association of America, as well as individual contributors. Additional contributions will help to ensure the long-term viability of the prize. Checks made payable to "ATS Math Prize" may be sent to the Association for Women in Mathematics, Box 178, Wellesley College, Wellesley, MA 02181.

# CONTRIBUTORS TO THE SCHAFER PRIZE FUND

AWM is grateful to the American Mathematical Society and the Mathematical Association of America for contributing so generously to the Alice T. Schafer Mathematics Prize.

We thank the following individuals for contributing to the Prize and for supporting the Association's efforts on behalf of undergraduate women.

Howard Anton, Cherry Hill, Pennsylvania

J. M. Arms, University of Washington

Winifred Asprey, Vassar College

Donna Beers, Simmons College

Julia Wells Bower, Orange City, Florida

Gerald Bryce, Ashland, Virginia

Marjorie V. Butcher, Trinity College

Anne W. Calloway, Kalamazoo, Michigan

Clara W. Gnerre, Belmont, Massachusetts

Rhonda & Anthony Hughes, Wynnewood, Pennsylvania

Ronald & Sandra Karp, Belmont, Massachusetts

Susan G. Marchand, Highland Park, New Jersey

Katharine E. O'Brien, Portland, Maine

Judith H. Obermayer, West Newton, Massachusetts

Ellen Maycock Parker, Indianapolis, Indiana

Nirmala Prakash, Cambridge, Massachusetts

Richard Schafer, Arlington, Virginia

Anna Shapazian, Watertown, Massachusetts

Erica Voolich, Somerville, Massachusetts

Judith Wason, Tuxedo Park, New York

Kathleen Whitehead, Arlington, Massachusetts

G. R. Wyckoff, Newington, Connecticut

Ann Yasuhara, Princeton, New Jersey

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## NSF-AWM TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Travel Grants is to enable women to attend research conferences in their field, thereby providing a valuable opportunity to advance women's research activities, as well as to increase the awareness that women are actively involved in research. If more women attend meetings, we increase the size of the pool from which speakers at subsequent meetings are drawn and thus address the problem of the absence of women speakers at many research conferences.

The Travel Grants. The grants will support travel and subsistence to a meeting or conference in the applicant's field of specialization. A maximum of $1000 for domestic travel and of $2000 for foreign travel will be applied.

Eligibility. Applicants must be women holding a doctorate in a field of research supported by the Division of Mathematical Sciences of the NSF (or have equivalent experience). A woman may not be awarded more than one grant in any two-year period and should not have available other sources of funding (except possibly partial institutional support).

Target Dates. There will be four award periods per year, with applications due November 1, February 1, May 1, and August 1.

Applicants should send a description of their current research and of how the proposed travel would benefit their program, a curriculum vita and a budget to Association for Women in Mathematics, Box 178, Wellesley College, Wellesley, MA 02181.

# SATTER PRIZE

The American Mathematical Society has established a new prize, to be called the Satter Prize. It is to be awarded every two years for an outstanding contribution to research in mathematics during the preceding five years. The recipient is to be a woman mathematician.

The first award will be made in January 1991. Selections will be made by a committee appointed by Professor William Browder, President of the AMS.

The funds to endow the prize were contributed by Professor Joan Birman to honor the memory of her sister, Ruth Lyttle Satter, who died last August.

The March-April issue of this *Newsletter* contained an article by Joan about her sister. This announcement about the prize, which should have accompanied Joan's article, was unfortunately omitted.

# CALL FOR NOMINATIONS

The American Mathematical Society has instituted a new prize, the Satter Prize, as described above. As chair of the Prize committee, I am soliciting nominations for candidates for this prize. Please send your suggestions and include, in addition to the candidate's name and field of interest, some information about the work for which the prize is to be awarded. Send these materials to:

> Professor Joan Birman
> Department of Mathematics
> Columbia University
> New York, NY 10027

Thank you very much for your interest and ideas.

Sincerely,

Linda Keen, Chair
Satter Prize Committee

# AWM TRAVEL GRANTS AWARDED

The following women were selected in February, 1990, to receive NSF/AWM travel grants to attend research conferences. Congratulations!

Patricia Cerrito, University of Louisville
Biometrics Society-American Statistical Society Conference, Anaheim, California

Jane Gilman, Rutgers University
XIV Rolf Nevanlinna Colloquium, Helsinki, Finland

Jo Heath, Auburn University
Spring Topology Conference, San Marcos, Texas

Fern Hunt, Howard University
Conference on Chaotic Dynamics, West Germany and the Netherlands

Louise Perkins, Massachusetts Institute of Technology
1990 Conference on Domain Decomposition Methods, USSR

Karen Pinney, University of Kentucky
AMS Summer Research Institute in Differential Geometry, UCLA

J. R. Sangwine-Yager, Saint Mary's College, Moraga, California
Convex Geometry Meeting, Oberwolfach, West Germany

Marianna Shubov, Texas Tech University
Schrödinger Equation Meeting, Oberwolfach, West Germany

Donna Testerman, Wesleyan University
Durham Symposium on Groups and Combinatorics, Great Britain

Diana Woodward, Southern Methodist University
SIAM Conference on Dynamical Systems, Orlando, Florida

## AWARDS AND HONORS

"Leitzel Named to NSF Post," from the *Notices* of the AMS, February 1990

Joan Leitzel, a mathematician and associate provost at Ohio State University, has been named as the director of the Division for Materials Development, Research, and Informal Science Education at the National Science Foundation (NSF). She began the NSF position on January 1.

In this position, Leitzel oversees four NSF educational programs funding projects primarily at the precollege level: Applications of Advanced Technologies, Informal Science Education, Instructional Materials Development, and Research in Teaching and Learning. These programs comprise a staff of ten professional scientists who act as program directors and ten support personnel; the budget for fiscal year 1989 was $44 million.

Leitzel says that increasing the involvement of research mathematicians in educational issues is "very important." "A lot of progress has been made in bringing the NSF's research directorates and education directorate closer together on issues of common importance," she notes. "That will be a goal for me at the NSF." She also is enthusiastic about the opportunity to play a role in science and engineering education at a time when national interest in education is high.

After receiving her Ph.D. in mathematics in 1965 from Indiana University, Leitzel went to Ohio State, where she has been ever since. She served as vice-chair and acting chair of the department of mathematics before being named associate provost in 1985. Her plan is to return to the faculty of Ohio State some time in the future.

As associate provost, Leitzel has considerable administrative experience that will assist her in her NSF post. Her responsibilities included overseeing instruction and curriculum, selective admissions, enrollment management, advising, teaching evaluation and improvement, interdisciplinary instruction, support programs for at-risk students, and articulation with high schools.

The 1989 Edyth May Sliffe Awards have been given to dedicated high school teachers who were nominated by high-scoring students on the American High School Mathematics Examination. Congratulations to: Pam Calder, Memorial Senior High School, Houston, TX; Patricia M. Gabriel, Thomas Jefferson High School for Science and Technology, Alexandria, VA; Rosemary Maguire, Tom C. Clark High School, San Antonio, TX; Margaret M. Mamsch, Prospect High School, Mount Prospect, IL; Grace Mutz, Farragut High School, Farragut, TN; Irene Stein, Fair Lawn High School, Fair Lawn, NJ; Shiela Strauss, Hunter College High School, New York, NY; Lynne Tsuda, Punahou School, Honolulu, HI; and Dorothy Wendt, Virgil Grissom High School, Huntsville, AL.

The University of Maryland won second place in the fourteenth annual Association of Computing Machinery Scholastic Programming Contest. Maryland's team was led by captain Christine Hofmeister, one of only two women on the 24 teams in the contest. Their prizes were $6,000 and an AT&T computer.

Congratulations to several women statisticians who have recently been honored. Margaret Elizabeth Martin was awarded one of the first two Founders Awards of the American Statistical Association. Nancy M. Reid was elected a Fellow of both the American Statistical Association and the Institute of Mathematical Statistics. Alice S. Whittemore was elected a Fellow of the Institute of Mathematical Statistics, while Grace L. Yang was elected a Fellow of the Institute of Mathematical Statistics.

Congratulations to Brigitte Servatius, Worcester Polytechnic Institute, who has received a 1990 NSF award in its Research Experiences for Undergraduates program for her program "Discrete and applied mathematics."

A Carl B. Allendoerfer Award for 1989 was presented to Judith V. Grabiner, Professor of Mathematics and History of Science, Pitzer College, Claremont, California, for "The Centrality of Mathematics in the History of Western Thought," *Mathematics Magazine*, Vol. 61(1988), pp. 220-230. A quote from *Focus*, October 1989, follows.

> Grabiner "decided that the most important thing I had to say would be to state, and give evidence for, the view that mathematics has played a central role in shaping western thought." The Committee's citation stressed that Grabiner's article "should be read by professionals as well as students... it gives the reader example after example of where and when mathematics has influenced thought."

Also, Beverly L. Brechner and John C. Mayer, jointly, received a George Pólya Award for their article "Antoine's Necklace — or How to Keep a Necklace from Falling Apart," *The College Mathematics Journal*, Vol. 19(1988), pp. 306-320. Again, a quote from *Focus* follows.

> The Cantor set is "the first topological space one becomes acquainted with which has really surprising properties," said Mayer. In their citation, the Committee on the Pólya Award expressed admiration for Brechner's and Mayer's work. "Although the concepts in this paper are difficult (one committee member remarked: 'Trying to think about the necklace made my head hurt!'), the clear exposition and exceptional figures made this paper enjoyable and readable."

## EDUCATION COMMITTEE COLUMN

Sally I. Lipsey, chair

Carol Kehr Tittle (Queens College and CUNY Graduate Center) has been funded by the Ford Foundation to develop material that assesses students' thoughts and feelings about mathematics and links them to instructional planning. She has written the following report for us about the project.

Over the past two decades, research in psychology and education has focused on two areas that hold promise for understanding performance and persistence in mathematics: cognitive psychology, and women and mathematics. From the first area there is a focus not only on achievement or actual problem solution, but also on the student's thoughts and awareness (self-regulatory, metacognitive) activities during the process of problem solving. From the second area there is a focus not only on achievement, again, but also on the affective, motivational, and attributional beliefs that students hold that are associated with achievement and persistence in taking mathematics courses. The goal of the Ford Foundation project on assessment and instructional planning is to "engineer" or translate findings from these areas for use in mathematics classrooms.

Carol Kehr Tittle of Queens College and of the Ph.D. Program in Educational Psychology and the Center for Advanced Study in Education of the Graduate Center has been funded for four years by the Ford Foundation to develop an assessment tool for use by teachers and students in junior high school math classrooms. Work began on the project in 1986-87, with the formation of a national advisory board and identification of CUNY mathematics education faculty, New York City junior high school math teachers, and NYC Board of Education representatives. Tittle and Associate Project Director Deborah Hecht have been involved in conducting teacher focus groups, trying out three forms of a questionnaire with 1200 New York City junior high school students, and, in the fall of 1988, administering a single, revised questionnaire to over 1700 New York City public school students in grades 7, 8, and 9.

The Mathematics Assessment Questionnaire (MAQ), a survey of thoughts and feelings for students in grades 7-9, is a prototype for collection of data on particular aspects of mathematics education. The MAQ provides information on student thoughts and feelings in relation to the teaching and learning of a particular process, that of solving word problems. As such, it provides additional, complementary information to that provided by teacher assessments of mathematical knowledge and procedures or by standardized tests of achievement. Because it is at the junior high school level that

many students make critical decisions about continuing with the standard curriculum, the MAQ focuses on these grade levels.

Student thoughts and feelings that are assessed include reflections on, and awareness of, cognitive activities or thoughts — when solving an individual, nonroutine word problem, and when learning about word problems in three settings. The three settings are: participating in a class (teacher-led direct instruction), working in a group with other students solving a problem, and doing homework. Other thoughts as well as feelings are assessed in the three settings. These include those related to affective and motivational beliefs — e.g., worry about learning, the reasons for understanding word problems, and the interest or value such problems hold for the student.

The major areas that the MAQ is encouraging teachers to examine for instructional planning are: metacognition, in the context of a nonroutine word problem; and self-regulatory thoughts and behaviors while attending class, working with other students, and doing homework. The other constructs in each class setting are: the affective beliefs of interest, value, confidence, and anxiety; the motivational beliefs of internal learning and external performance goals; and beliefs about the attributions of the causes for success and failure in working word problems. There are 161 statements in the questionnaire, and it can be answered in one or more class periods.

The current work on the project is to prepare two products and to develop the next steps in making the MAQ accessible for classroom teacher use. The two products are a manual for users and a technical report. The manual for users includes sample student and class responses as well as instructional strategies, to assist teachers to use the information from the questionnaire for instructional planning. The technical report includes descriptions of the project development and the analyses of the data from the 1700 students who responded to the questionnaire in the fall of 1988. The analyses to date are exciting, showing that there are stable and meaningful clusters of statements in the metacognitive and self-regulatory areas and that students' perceptions of thoughts and feelings are different in the three classroom settings. Other analyses have shown that high and low achievement students differ in their responses to the metacognitive statements and to the belief statements. These analyses support the original design for the assessment questionnaire.

The next steps in the project are to prepare a prototype form of the questionnaire to be taken by students on a microcomputer and to field test the formats in which information is perceived as meaningful and useful to teachers and students. The extensive information provided by the questionnaire can be organized for teacher use when students respond on a computer and teachers choose the information they want to display. Preliminary work on the forms to report information indicates that teachers differ in the information they find meaningful and useful. Although teachers have participated in the development and reviewed the questionnaire, the information being reported systematically from the questionnaire is a new area for them and will require collaborative work to develop the most useful ways to present the information. Funding is being sought for this next step of working with teachers and students on a microcomputer based version of the questionnaire and of organizing the data for classroom use.

The MAQ is a model of an assessment instrument that is intended to help teachers focus on the attitudes and beliefs which girls have about mathematics that discourage their persistence in solving mathematical problems and encourage their perceptions of themselves as unsuccessful in mathematics. The selected constructs have been drawn from research on women and mathematics [Chipman, S. F., L. R. Brush, & D. M. Wilson, eds. *Women and Mathematics*. 1985. Hillsdale, NJ: Erlbaum]. The strategies for instruction focus on classroom activities that mathematics educators and teachers suggest will assist in changing girls' beliefs.

## EDUCATION COMMITTEE CALL FOR STATE REPORTERS

We invite you to become a member of our committee as a "state reporter," who will be responsible for an annual report on mathematical education activities in your state, especially with respect to projects involving women and mathematics. Such information might be based on material from a state department of education, and/or state or local educational institutions, or other sources. We would like to make sure that each state is represented.

Would you be willing and able to take on the responsibility to be the state reporter from your state? If so, when during the year would it be convenient for you to submit such a report?

Please respond to AWM Education Committee, c/o Sally I. Lipsey, 70 East 10th St., #3A, New York, NY 10003. Thank you.

# MAKING PROGRAMS FOR THE MATHEMATICALLY TALENTED WORK FOR ALL STUDENTS

by Harvey B. Keynes, Phil Carlson and Laura Cavallo
Special Projects, School of Mathematics, University of Minnesota

## Introduction

The thirteen-year-old University of Minnesota Talented Youth Mathematics Program (UMTYMP) is a statewide mathematics program designed for the most capable mathematically talented students in grades 5-12. It provides an intense learning experience in a serious but very supportive environment. The structure is described in detail in the article "Enhancing Female Participation in Programs for Mathematically Talented Students," *UME Trends*, Vol. 1, August 1989.

A major concern of the UMTYMP is to improve the participation of females and underrepresented groups. In 1987, the Program did a serious self-study of these issues and decided to focus first on increasing the involvement of female students. While historical participation of females in UMTYMP had been quite good, several issues and social pressures seemed to create a situation where highly talented females chose not to participate in UMTYMP or left for the "wrong" reasons. The *UME Trends* article again provides more detail. Knowing the outstanding reviews from the UMTYMP female alumni on the benefits of the Program, we felt that creating a more supportive environment and initiating a different level of social involvement within the Program might improve the situation. Moreover, we believed that the experience developed in structuring this type of project would enable the UMTYMP to more successfully initiate a similar project for underrepresented groups. Based on a generous and imaginative grant from the Bush Foundation, we designed a series of interventions and support activities to improve the awareness of the Program and the environment for female students. We took the point of view that all of these interventions should be carefully evaluated, and the Program should try to identify which interventions worked and for what reasons. We also took care to note attitudinal shifts and anecdotal information which also point to changes, but are more difficult to quantify.

This three-year project is now in its second year and has just completed its initial 16-month phase. In this paper, we describe our initial activities and some of the initial outcomes. We also describe some ongoing concerns and methods which may help to correct these problems. We are extremely encouraged by the initial results and look forward to further improvements as we begin our second 20-month phase.

## The Bush Foundation Intervention Project

With the initial support starting September, 1988 from the Bush Foundation, the Program designed several interventions to address these concerns. The interventions primarily addressed informational, counseling and support issues rather than the program structure itself. They involved working with the families and the schools as well as the students. The Program believes that the need to encourage a supportive home and school environment cannot be overemphasized. A statement endorsed by the NCTM and the MAA in January, 1989, provides an excellent rationale for encouraging parental and school involvement in the intervention process. Distributed to UMTYMP parents, it asserts that "social, economic or educational status of parents does not have as important an effect on their children's learning as what parents *do* with their children." Recommendations include discussing classroom activities with their children, providing a time and place for them to study, participating in conferences, and playing appropriate family games and activities that use a variety of mathematical skills. It also encourages parents to complement the school's efforts by becoming aware of the breadth of mathematics topics covered in their children's programs and more involved in supporting good work habits. In an effort to sustain parental involvement UMTYMP has established a variety of academic year parent/student activities such as orientation sessions, a workshop on learning styles, and a math fun fair. The academic progress of all students is monitored by an UMTYMP counselor, and there is continued emphasis on regular counseling contacts with the parents.

Social events have become a key component of the intervention project and have been extended from algebra girls only to all levels of the program. While the socialization began with female only events such as a bowling party and a movie and pizza party, the students have now expressed a strong desire for coed parties, as well as a desire to become a part of the planning process. A letter from a concerned female geometry student suggested that rather than isolate the girls by sponsoring single sex

parties, we should bring the girls into the mainstream with coeducational functions. She also suggested the establishment of a student board to plan the activities. Both of these suggestions are being implemented. All future social activities will be coed and will include a winter skating/skiing party and a trip to Valley Fair Amusement Park. To support the perspective that UMTYMP provides not just a math education, but encourages a culture of mathematics, older students participate in social events that focus on college and career information. One such event was a calculus luncheon which featured a social hour followed by alumni presentations on the impact of UMTYMP on their college experiences. The presenters included four female alumni, two of whom are Ph.D. candidates, and three male alumni. In an effort to provide women role models and possible mentors for calculus females, a "shadow" program is being established whereby these young women will have the chance to experience women at work in various fields of study. The Learning Styles workshop and Math Fun Fair are being developed to enhance the experience of the younger UMTYMP students.

New testing procedures and special orientation meetings for girls who were nearly successful in the qualifying examination were established. Activities to encourage and support girls who nearly qualified were also included in the intervention process. The near-qualifiers were invited to a variety of social activities with current UMTYMP girls. These interventions will continue this year. The near-qualifiers will be involved in a bowling party, Learning Styles Workshop, Outdoor Winter Party, Math Fun Fair and a trip to Valley Fair. Inclusion of the near-qualifiers proved to be very successful in 1989-90, with a consistently large number of near-qualifiers attending the functions. Also, a program developed for select schools supported key teachers to encourage increased participation of their more mathematically talented female students in UMTYMP. Last year's target school intervention had a slow start and was not as successful as hoped for. Procedures are now in place to improve this intervention project. The project and its contact teachers will be more closely monitored this year, and, in an effort to provide the contact teachers with activities for their students, invitations will be extended to them for three UMTYMP events. This year's contact teachers are also being asked to identify a smaller number of females (five to ten) to make the task more manageable. One of last year's contact teachers has returned to the project and provides insights and guidance to the new teachers.

As in 1989, with partial support from the NSF Young Scholars Project, a two-week special Summer Institute for current UMTYMP students and a Summer Enrichment Institute for prospective UMTYMP girls will be offered in June 1990. Both Institutes, held on the University campus, are special enrichment-oriented programs that teach enrichment topics different from the usual curriculum, while incorporating problem-solving techniques and math league competition skills. The residential Summer Institute is designed for UMTYMP students, while the non-residential Enrichment Institute is a half-day program designed to increase the interest of female near-qualifiers to retest for UMTYMP. Along with the enrichment activities, the Institutes provide industrial tours, career information and socialization activities for students. Both outstanding high school teachers and University of Minnesota mathematicians are involved in the program. There were two special institute activities in 1989. Some advanced calculus students were given an opportunity to work with Dr. John Hubbard, an expert mathematician and computer specialist on geometry and innovative educational software. World-class mathematicians associated with the Geometry/Supercomputer Project and UMTYMP cohosted an extraordinary closing event for participants in both Institutes, additional teachers and potential students. A luncheon for the students included University of Minnesota President Hasselmo, Provost Rama-Murthy and IT Dean Infante from the University of Minnesota, business leaders, and other mathematicians. This luncheon was preceded by a highly informative talk on the geometric aspects of tilings by Dr. William Thurston, Princeton University, the leading American expert in this area. The luncheon was followed by an exceptional talk and video presentation by the founder of fractals, Benoit Mandelbrot. His talk of the fractal cosmos was so exciting that many students asked for his autograph at the conclusion!

In 1989, the Summer Institute attracted 26 students, 1/3 of them female. Evaluation results from the Summer Institute indicated that the Institute was a positive experience for the participants and that they enjoyed the enrichment approach used in the classrooms. This is evident in the survey's findings that nearly three-quarters of the participants want to return this year. The Summer Enrichment Institute consisted of 14 prospective female students. The success of the Enrichment Institute prompted parents' comments such as "My daughter had a positive experience and has a better understanding of the program and her own thoughts about being in UMTYMP" and "We feel this program will increase her confidence in her math abilities and will also motivate her to continue."

This year an emphasis is being placed on attracting more students to these institutes. Speakers and activities will be carefully reviewed as to their appropriateness for the student age level and mathematical knowledge. Last year's programs will be expanded and will again provide mathematical enrichment, career information, and opportunities for socialization with other bright students. New programs and more intensive involvement with the Geometry/Supercomputer Project will be sought.

The overall aim of the Bush Intervention Project is to continue creating a supportive environment which encourages capable females to seriously involve themselves in mathematics. The initial success of these interventions is indicated by the following quotes:

"I realize the importance of the early encouragement I got in UMTYMP; I will pass on that encouragement to other girls as a role model and through volunteer projects." Kristi Pereyra, UMTYMP graduate and current UMTYMP Teaching Assistant, B.A., 1990.

"Last year was our daughter's first and I saw the benefits in light of her growth and development and love of mathematics." Kathy Callaghan, UMTYMP parent.

"She has never thought of herself as 'very good' at math, having been in a class with other equally good students, however, the reality of it is now dawning on her and it has really made a difference to her self-confidence." Rosalyn Gutman, UMTYMP parent.

## Progress Report

Although the project is just completing its first phase, initial results are very promising. In September, 1988, partial implementation of the new testing procedures resulted in a much stronger applicant population. Using a more difficult qualifying test and a higher cutoff than previous tests, a class 20% larger than usual was admitted. The testing population was 44% female, and 32% of the entering class was female. Despite higher standards, female scores showed an overall improvement and were more evenly distributed than in the past. In the Spring of 1989, an improved preregistration procedure was implemented which involved supplying schools with preregistration packets to be distributed to students. Parents then sent the preregistration form directly to the UMTYMP office. These new procedures created an even stronger applicant pool, and further gains in female enrollment were realized. In 1989, the testing population was 45% female, and over 40% of the entering class was female. That is a 25% increase in the percentage of female enrollees after only one full year of these interventions, and an 83% increase over the 1987-88 academic year which had no interventions. Furthermore, the females who preregistered as a group in the spring scored two points higher on the qualification test than the females who decided to register through the schools in the fall. The statistical difference between the means of the two groups is highly significant.

Further examination of prior data suggested that the near-qualifier pool should be expanded to include those girls who score within ten points of qualifying for the program. (Previously, near-qualifiers needed to score within three points of qualifying.) This larger pool of the 1988 near-qualifiers was either given an opportunity to take a spring qualifying exam or mailed a letter urging them to retest in the fall of 1989. As a result, 53 near-qualifiers tested in the spring, with twelve accepted into the program, and 49 of the 60 preregistered near-qualifiers actually tested in the fall of 1989. Of those 49, 16 were accepted into the program. This is a remarkable qualifying rate of 32%, far higher than the historical qualifying rate of 8%-10%. Overall, the new strategies to encourage near-qualifiers and implement more equitable enrollment appear to be quite successful.

Based on the literature and prior UMTYMP experience, it was decided that a class with 50% enrollment of each sex would be most desirable. In 1988, three algebra classrooms were 50%-50%, and two were all male. Equal enrollment classes have led to much improved and more supportive classroom dynamics for the female students. In fact, one class was clearly dominated by its strong and vocal female group in the first year. Together with the social opportunities and workshops, this structure has led to improved retention of girls. In the first year of intervention, the retention rate from Algebra I to Algebra II for boys and girls was essentially the same (91.9% for girls, 92.1% for boys). In the 1987-88 school year (prior to any interventions) the corresponding retention rates were 85.7% for girls and 90.7% for boys. The retention rates from Algebra II to Geometry were nearly identical for boys and girls (85.3% for girls, 85.7% for boys). The corresponding rates in 1987-88 were 83.3% for girls and 84% for boys. The 1988-89 retention rates are significantly higher than in 1987-88 and represent a major difference for female students. As of January 1990, only 6% of the Algebra students have withdrawn, and only 25% of that group are female. Hence, the dropout rate for girls is now

below that of boys. None of the Geometry students have withdrawn. It appears that some of the issues of isolation and lack of significant friendships with other UMTYMP girls have now been resolved.

The success of these interventions can also be measured by observing the behavior of the students. Near the end of spring term the algebra students were given the opportunity to request classmates for their next year's geometry class. In the formation of these classes we were able to honor almost every request. One class in which the females dominated the sessions was particularly adamant about being placed in the same geometry class for the following year. One week into the 1989-90 school year, students from that class repeatedly called a girl who had dropped out of UMTYMP and convinced her to rejoin them. She decided to reenter three weeks into the fall term. As another example, on the first day of fall 1989 classes, returning students excitedly greeted friends and rushed to the bulletin board where the class lists were posted to find out with whom they would share geometry class. Finally, one of the geometry teachers had to miss class, so her students were disseminated into the other three geometry classes. Her students said that, despite the fact that the other teachers were good, they were very anxious to return to their class and learn with their friends.

Along with the activities mentioned earlier in the article, plans for this year include a summer employment program. UMTYMP alumni who are currently in college are encouraged to send a resume to the UMTYMP office. In 1989, twenty-eight resumes were received with 21% of these resumes coming from female students. These resumes were sent to nine companies according to the interest of the student and the needs of the companies for summer employees. Partial data indicate that at least five students were placed in jobs. Three of these students worked at the University of Minnesota Supercomputer Center in the summer of 1989 helping with the Geometry/Supercomputer project. This placement program has been expanded this year to include more companies. As of January 1990, six students have already been hired for this coming summer.

In light of these advances, the program will continue to try new approaches and modify its old ideas. We are convinced that with these types of efforts, the quantity and quality of female participation in UMTYMP as well as the environment for the entire program will continue to improve.

## CALL FOR TOPICS FOR 1992 AMS CONFERENCES

Suggestions are invited from mathematicians, either singly or in groups, for topics of the various conferences that will be organized by the Society in 1992. (The conferences are: AMS Symposium in Pure Mathematics, AMS Summer Institute, ASM-SIAM-SMB Symposium: Some Mathematical Questions in Biology, AMS-SIAM Summer Seminar, AMS-IMS-SIAM Joint Summer Research Conferences in the Mathematical Sciences, AMS Short Course Series.) An application form to be used when submitting suggested topic(s) for any of these conferences (except the Short Course Series) may be obtained by writing to the Meetings Department, American Mathematical Society, P.O. Box 6248, Providence, RI 02940, telephoning 401-455-4146, or sending E-mail to MEET@MATH.AMS.COM.

Individuals willing to serve as organizers should be aware that the professional meetings staff in the Society's Providence office will provide full support and assistance before, during, and after each of these conferences. Organizers should also note that for all conferences, except Summer Research Conferences, it is required that the proceedings be published by the Society, and that proceedings of Summer Research Conferences are frequently published. A member of the Organizing Committee must be willing to serve as editor of the proceedings.

All suggestions must include the names and affiliations of proposed members and the chairman of the Organizing Committee; a one- to two-page description addressing the focus of the topic including the importance and timeliness of the topic, and estimated attendance; a list of the recent conferences in the same or closely related areas; a tentative list of names and affiliations of the proposed principal speakers; and a list of likely candidates who would be invited to participate and their current affiliations. The Meetings Department of the Society is responsible for the final selection of the site for each conference and for all negotiations with the host institution. Individuals submitting suggestions are requested to recommend sites or geographic areas which would assist the Meetings Department in their search for an appropriate site. In the case of Joint Summer Research Conferences in the Mathematical Sciences, a one-, two- or three-week conference may be proposed.

More information, including deadlines for the submission of topics, may be found in the *Notices* of the AMS, March 1990, pp. 322-323.

# REPORTS ON SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

## Sweet Briar College Sonia Kovalevsky High School Mathematics Day

The Sweet Briar College Sonia Kovalevsky High School Mathematics Day was held on Saturday, October 14, 1989, from 9:00 A.M. till 3:00 P.M. Ninth and tenth grade girls and their math teachers from thirteen schools in the surrounding area were invited to participate. Thirty-two students and eight teachers attended. Although we were somewhat disappointed with the small attendance, the enthusiasm of those who did come was encouraging.

The program began with welcoming remarks from Robin Bowers, the Dean of the College. This was followed by "Women Use Math," three brief and lively presentations on careers. Helena Smith, instructor in the School of Nursing at Lynchburg General Hospital, described many ways that nurses use math. Deborah Bullett of Falls Church, Virginia, described her work as a project engineer for TRW. Ann Morton Habliston, who is a coordinator of actuarial services for the National Rural Electric Cooperative Association, described what an actuary does. All three emphasized the importance of communication skills as well as problem-solving skills.

Teachers and students separated for the 50-minute workshops. For the teachers there was a resource display, including a demonstration of Derive and preview videotapes of "For All Practical Purposes" and "Against All Odds." The career speakers were available for conversation. Meanwhile, each student attended one of five workshops: "Gambler's Ruin" on Markov processes, "Soap Film Geometry," "Is the Hand Slower than the Eye?" on measuring human reaction times, "What Are the Odds?" applying probability to the Virginia lottery, and "How to Keep a Secret: Cryptography." These were led by Sweet Briar College faculty members and were designed to keep the students actively involved.

Teachers and students attended the rest of the day's activities together. Prof. James Kirkwood of Sweet Briar College showed portions of a videotape, "Frontiers of Chaos," and explained how the images were generated. Following lunch in the College dining hall, Dr. Mary Gray of The American University spoke on "Lies, Damned Lies, and Statistics." This was an informative and enjoyable discussion of the use and misuse of statistics in jury selection and court cases.

Students and teachers filled out one-page evaluation forms before attending the closing reception. The evaluations were very positive. The career talks, Dr. Gray's lecture, the fractals film and the workshops all received enthusiastic endorsements. The teachers suggested that juniors and seniors would have benefitted from the program, so our next Sonia Kovalevsky High School Mathematics Day will probably include girls in grades nine through twelve. An unexpected bonus of the program was the contact between our faculty and the high school math teachers, who asked to be included in more of our department's activities.

The program was provided at no cost to the participants. We think the program accomplished its goals of encouraging girls to continue studying mathematics and providing them with career information and role models. We're grateful to AWM for its support.

## First Annual Greater Cleveland Sonia Kovalevsky HS Mathematics Day

organized by Pratibha G. Ghatage, Cleveland State University,
and Janeal M. Oprea, NASA-Lewis Research Center

The Sonia Kovalevsky High School Mathematics Day was held on Saturday, October 7, 1989 under joint sponsorship of the Association for Women in Mathematics and the Thomas H. White Charitable Trust. Approximately seventy students (from grades ten and eleven) and fifteen mathematics teachers from the greater Cleveland area came to Cleveland State University, some traveling over sixty miles. The schools represented ranged from parochial schools to suburban schools to inner-city schools. Approximately one-fourth of the participants were minority students.

The day began with a welcome by Dr. Earl Anderson, Dean of the College of Arts and Sciences at Cleveland State University. Throughout the rest of the day, the students and teachers attended career panel discussions, presentations of several mathematical applications, and informal lunchtime activities.

Career Panel Discussions: The participants were divided into two groups, each group meeting with a different set of panelists in the morning and afternoon. This resulted in a very open exchange between the panelists and the participants. The panelists were accountants, a statistician, an actuarial

consultant, a computer software engineer, an aerospace engineer, and a mathematics professor. Some of the panelists had received part of their mathematical training at Cleveland State University, a fact which seemed to appeal to the audience. The panelists emphasized how the most basic mathematical training equipped the student with problem-solving skills and the ability to retrain oneself to cope with the ever-changing world of science and industry. The young women in the audience and their teachers were curious to know how the panelists had overcome prejudices against female advancement in the academic and industrial world. Judging from the student and teacher evaluations, most participants found the panel discussions interesting and informative, and the teachers felt they could use some of the information in their classrooms.

Mathematical Applications: The panel discussions were followed by half-hour sessions (for groups no larger than five) on applications of mathematics such as percolation theory, general physics, genetics, cryptology, chaos, linear programming, and civil engineering. Students found the level of mathematics used within their reach and understanding. The most popular were chaos, percolation theory, general physics, and genetics.

Lunch-time Activities: A lunch was served for students in one room and for teachers in another. A colorful and lively presentation was given for students by Nanda Hopenwasser of the English Department at the University of Alabama. Meanwhile, the teachers, the career panelists, and some Cleveland State University faculty participated in a roundtable discussion on counseling mathematically capable females and minorities.

After lunch there was another panel discussion and more mathematics applications, so every participant would have the chance to observe three applications.

For our part, we were pleased with the outcome. It seemed that students and teachers felt very positively about sharing this mathematical experience. To get a better feeling about their reactions, we gave out evaluation forms to students and teachers. Based on the ones that were returned, we both feel enthusiastic about making this an annual event.

We wish to focus on greater involvement of inner-city students, as their need in this area is more significant. Towards this end, we have been in touch with William Bauer, the Mathematics Coordinator of Cleveland Schools, and we propose to work closely with him to involve his students in much greater numbers. This can be achieved by arranging a day that does not conflict with other activities such as homecoming or mathematics competitions, and/or by scheduling our event in the latter part of October so the teachers have a little more time to respond after the schools open. We have seen that a lot of talented high school girls are eager to learn about careers that mathematics can open for them, and this is a need that must be met.

# BOOK REVIEW COLUMN

**Mathematics and Global Survival** by Richard H. Schwartz. Ginn, 1989. xxi + 283 pp (paperback). ISBN 0-536-57540-1.
Reviewer: Claudia Zaslavsky, NY, NY

Back in the 1960s, when the federal government was handing out money for the improvement of mathematics education, several colleagues and I received grants to design a mathematics curriculum for potential dropouts from high school mathematics, students who were either unprepared or unwilling to take the academic courses. We tried to motivate the students by including hands-on activities and meaningful applications. The twelfth-year curriculum offered a much-needed review of basic skills in arithmetic and graphing through the medium of practical problems in elementary statistics and probability. If Richard Schwartz's book had been available to us at that time, we might have been spared much time and effort.

*Mathematics and Global Survival* deals with the critical issues that concern every thoughtful citizen — scarcity and hunger, population growth, pollution and waste, poverty, health, and the arms race. No longer need liberal arts students wonder, "Why must I take math?" Students learn to analyze graphs, tables and charts taken from such real-world sources as the 1988 World Population Data Sheet and the U.S. Bureau of the Census. The introductory comments for each topic, as well as the exercise sets, encourage students to consider the implications of the data, to engage in further research, guided

by the chapter references and the extensive bibliography, and to become actively involved in solving these problems of global survival. An "Index to Problems by Global Issues" enables the instructor or the students to select the most relevant topics, if time does not allow completion of the entire book.

Mathematical topics include operations and applications involving integers and rational numbers, graphing, arithmetic and geometric sequences, sampling and other topics in statistics and probability, and problem solving by arithmetic and algebraic methods. Many problems are worked out in detail, and solutions are given to odd-numbered exercises.

This book, an updated version of a course that Professor Schwartz has been teaching for many years at the College of Staten Island (City University of New York), should appeal to a wide audience at both the high school and college level. Students who have been unsuccessful in the past have the opportunity to improve their skills in a context that does not insult their intelligence. Students majoring in the social sciences, education, business, and many other fields will find the material relevant and challenging. We can join Professor Schwartz in his hope that "this book will help point the way to a safer, saner, more just, and ecologically harmonious world for them and their future generations."

**Let's Play Geometry** by L. N. Shevrin and V. G. Zhitomirsky. Mir Publishers, Moscow, USSR (Imported Publications, 320 West Ohio Street, Chicago IL 60610; 312-787-9017).
Reviewer: Mary Flahive, University of Lowell

This book is translated from the Russian by Alexander Repyev. The translation is not at all stilted and uses the British equivalent of many words. It has the additional charm of not being slick in appearance. Unfortunately, this extends to some confusing placement of pictures within the text.

In the preface the authors claim that the book is designed for children six to eight years old, with active adult involvement. That seems to be an accurate description of the level. The book is developed around a group of preschool children (which includes Pinocchio, presumably for his geometric features) who learn some geometric terms and explore shapes and measurements. Occasionally adults intervene, suited up in the professional garb; all except the schoolteacher are male. There are few interesting exercises in the five sets of worksheets (about equally spaced in the text of the book); most are of the folding paper or measuring variety.

NOTE: Beth Ruskai brings to our attention "another science resource worth knowing about — called *Wonder Science*. It's a thin (eight-page) slick magazine published monthly September to May and aimed at fourth to sixth grade children. It contains simple interesting experiments children can do with ordinary kitchen and household items. It was started by the ACS (American Chemical Society) and is now published jointly by ACS/AIP (American Institute of Physics). I think it's very well designed, and at only $5 or $7.50 (handling charge varies with number of copies per address) per year, it's great value for the money!

"Although there's no math *per se*, it encourages an interest in related science topics and is worth the attention and support of the math community.

"For further information and sample copies, contact the ACS at 1-800-333-9511."

Book Review Editor:

Cathy Kessel
3141 Lewiston Ave.
Berkeley, CA 94705

# AWM PHONE NUMBER CHANGE

The AWM office in Wellesley now has two phone lines. The old line, reached through the Wellesley switchboard, will be used mainly for the computer. The number of record for the office is now **(617) 237-7517**. Please note this change. The answering machine will be on this line, and the calls will no longer go through the Wellesley switchboard.

## LETTER TO AWM

Dear Dr. Mesirov:

In the aftermath of the December 6 tragedy at École Polytechnique, your kind words of sympathy have been a source of consolation. Indeed, the staff and students were deeply touched. On their behalf, please accept our most heartfelt expression of gratitude.

May peace, love, and serenity be with us all during 1990 and with all members of AWM.

Roland Doré, ENG
President

## CHINA DELEGATION

Note from the executive director:

AWM withdrew its sponsorship from the People to People Women in Mathematics China Delegation. There has been no change in the executive committee's decision. People to People was given permission to use the AWM mailing list, but did not submit the material to be reviewed by the AWM office as required. It came to our attention that the material implied that AWM is sponsoring their June trip. AWM requested that People to People contact all members of the AWM with a formal retraction and apology. People to People sent a bulletin to all AWM members on March 29, 1990 to clarify the situation.

## PUBLICATIONS OF INTEREST

*Changing America: The New Face of Science and Engineering*, the final report of The Task Force on Women, Minorities, and the Handicapped in Science and Technology, was published in December 1989. In the Interim Report, six goals were presented for the nation. In the Final Report, calls to action are delivered to: the President, governors, state legislators, industry, the federal government, universities, school boards, educators, parents, professional societies, the media, and all Americans. The report also includes a listing of exemplary programs which aim to increase the participation by underrepresented groups in the science and engineering workforce. Contact people are given for each of these programs. For a copy of the report, write to NSF.

*Mother Jones* for December 1989 contains a short article on page 14 about German mathematician Maria Reiche, who has lived in Peru for fifty years.

> ...Reiche, eighty-six, is the official guardian of the Nazca pampa — the desert terrain on which an Indian civilization left massive drawings of birds, animals, and other shapes some two thousand years ago.

> Reiche spent years measuring, charting, cleaning, and studying the drawings, some of which are six miles long. She says they correspond to constellations. "This work was done so that the gods could see it from above and help the ancient Peruvians with their farming, fishing, and all their other activities."

*The Guardian* for August 6, 1989, contained an interesting cartoon. Called "Floppy Jumpers" (that's floppy sweaters over here!), the background for two women talking is a typical set of complicated knitting instructions. The conversation goes: "What are you knitting?" "Just a minute... sorry, that was the tricky bit, ... actually, it's a cover for the computer — can't be too careful with those viruses about." "Do you use it?" "The computer? Good Lord, no! Way beyond me. Anyway..." — and back she goes to the highly mathematical instructions.

Both *The Economist* of February 24, 1990 and *The Christian Science Monitor* of February 27, 1990 contain articles about the controversy over how much Einstein's first wife, Mileva Einstein-Maric, contributed to the theory of relativity. Several different points of view were presented during the annual meeting of the American Association for the Advancement of Science.

An excerpt from "First Wife's Role in Einstein's Work Debated" by Simson L. Garfinkel, *The Christian Science Monitor*, Feb. 27, 1990, p. 13, follows.

> [W]as Mileva Maric merely Einstein's housekeeper and algebraic assistant, or was she a physicist in her own right, who would have been recognized as a coauthor in her husband's work were it not for the pervasive sexual discrimination of the time?
>
> ...
>
> Maric worked with physicist Paul Habicht to develop a machine for measuring small electric currents. ... [W]hen Einstein patented the device, her name was omitted and the patent was listed under the name "Einstein-Habicht."
>
> ...
>
> "It was quite normal for men to appropriate women's work and take credit for it then," said Troemel-Ploetz.
>
> An alternative explanation, she said, is that there was an agreement between the couple to keep the wife's contributions secret so that her husband would have a better chance of obtaining a university appointment. When Maric was asked why her name was not on the patent, she replied, "What for? We are both only one stone," said Troemel-Ploetz. (The name Einstein means "one stone.").

The following is an excerpt from "The relative importance of Mrs. Einstein," *The Economist*, February 24, 1990, p. 86.

> The Einsteins studied physics together at the Federal Polytechnic School in Zurich. They got similar grades, though both were mediocre compared with other students in their class. In letters to his wife, the young Einstein often discussed the ideas and experiments that led him (or her, or both) to discover special relativity.
>
> In New Orleans, Dr. Evan Walker, a physicist who works at a cancer institute in Aberdeen, Maryland, presented letters hinting that Mileva did much more than listen to and advise her husband. Albert repeatedly referred to "our work," "our investigation" and "our theory". In one letter he wrote, "How happy and proud I will be when the two of us together will have brought our work on the relative motion to a victorious conclusion!"
>
> ...
>
> Dr. Senta Troemel-Ploetz, a linguist at the German Research Institute in Bonn, contends that Albert exploited the talent and labour of his wife, stole ideas from her, and expected her to do his mathematics after she had finished cooking dinner and washing up the dishes.

"Females in Mathematics: Erasing a Gender-related Math Myth" by Dyanne M. Tracy and Susan M. Davis appears in *Arithmetic Teacher*, December 1989. The article presents some tasks for students in preservice elementary mathematics methods classes designed to alleviate their mathematics anxiety. "Each task is designed to erase a gender-related mathematics myth by acquainting students with female-mathematician role models."

The Association for Women in Science *Newsletter* for January/February 1990 contains the interesting article "Is the SAT Unfair to Women?" by Barbara Mandula. The article is a based on *The SAT Gender Gap: Identifying the Causes* by Phyllis Rosser [1989. Center for Women Policy Studies, 2000 P St., NW, Suite 508, Washington, DC 20036. $15.00] and the Hearing on Gender Bias in Testing held in October 1989 in Washington, DC [cosponsored by the National Women's Law Center and the National Commission on Testing and Public Policy; $25 transcript, free report available from Laura Epstein, National Women's Law Center, 1616 P St., NW, Washington, DC 20036]. From the article:

> Women regularly score lower than men on both the verbal and math portions of the SAT, a finding that is both important and distressing. These tests play a major role in determining who gets various scholarships and who gets admitted to specific colleges. Furthermore, the SAT scores underpredict women's freshman grades in college while overpredicting men's college performance, thereby seriously undermining confidence that the test fulfills the purpose it was created for.
>
> Men have scored higher than women on the math section of the SAT since its inception in 1926, but the women's higher verbal scores partly offset the men's higher math scores. However, starting in the 1950s, the number of verbal questions set in science and business contexts was increased while some of the questions that traditionally favored women were removed. Whether the goal was to raise the scores of students with

science/business interests (who just happened to be mostly male) or directly to increase male scores, the latter effect occurred. Girls lost their verbal lead in 1972 and have not regained it. The Educational Testing Service, which designs the SAT for the College Board, has not attempted to "re-balance" the verbal section or to "balance" the math section by gender. Men outscore women nationally by 47 points on the math sections.

...

This brief analysis shows how easily the verbal test results can be manipulated by the choice of questions. The test-maker could in the future modify the verbal questions to increase scores of women, or the scores of minority racial/ethnic groups, who now do poorer than whites on the verbal sections.

...

When MIT compared its students' SAT scores with their grades as MIT sophomores and seniors, it discovered that women with lower SAT math scores were achieving Grade Point Averages equal to or better than their male peers. To compensate, MIT has been admitting women with lower SAT scores than men.

from the same issue of the AWIS *Newsletter*:

Interested in finding out about an educational consortium working to support black and women students in the sciences? Write COSEN, Carolinas-Ohio Science Education Network, 314 Samuel Mather Hall, Kenyon College, Gambier, OH 43022.

IBM's Research Division has produced a 10-minute videotape titled "Women in Science," featuring informal comments by women scientists at the company. Their discussions range from scientific career choices to combining personal and professional lives. Single copies are available at no charge from: Andrea Minoff, IBM T. J. Watson Research Center, P.O. Box 218, Yorktown Heights, NY 10598. 914-945-3167.

Iowa State University Press seeks monographs for their series "Women in Science and Technology: Studies and Reflections." Send inquiries to series editor Diane M. Calabrese, Ph.D., 22 Summer St., Dedham, MA 02026.

from the March/April 1990 issue of the AWIS *Newsletter*:

Douglass College has introduced [a] new [project]. As part of their continuing support of women in math and science, they have established a special interest residence called Bunting-Cobb Math and Science Hall. It houses 100 undergraduate women and 10 graduate women in math and science. The hall is named after former Douglass deans Mary Bunting and Jewel Plummer Cobb, both scientists. The hall contains a science library, computer room, study room and student lounge. For more information call Ellen F. Mappen at 201-932-9197 or Veta Pierce at 201-932-9554.

The WME *Newsletter* for March 1990 contains an article called "Girl Scouting in Science and Mathematics: A Program for Adult Leader Training." The Girl Scouts of the USA has recently expanded its informal curriculum in the areas of science, mathematics, engineering, and computers. Troop leaders have so far been reluctant to encourage their scouts to acquire badges in these areas. The Office of Opportunities in Science of the American Association for the Advancement of Science is in the midst of a project to increase the participation in hands-on informal science activities of Girl Scouts in particular and community groups in general. Write Marsha Lakes Matyas, Office of Opportunities in Science, AAAS, 1333 H St., NW, Washington, DC 20005 for more information.

*Sharing Resources* is the publication of the EQUALS Consortium (EQUALS, Lawrence Hall of Science, University of California at Berkeley, Berkeley CA 94720). The December 1989 issue focuses on science. Several interesting activities for Family Science are included (write Peggy Noone, Northwest EQUALS, P.O. Box 1491, Portland, OR 97207 for more information).

The Project on the Status and Education of Women has just revised its publication "Financial Aid: A Partial List of Resources for Women." For ordering information for this resource or for the many other fine publications of the Project, write Project on the Status and Education of Women, Association of American Colleges, 1818 R St., NW, Washington, DC 20009.

Thanks to the following folks for bringing some of the articles above to our attention: Pat Kenschaft, Cathy Kessel, Sally Lipsey, Linn Sennott and Claudia Zaslavsky.

# ADVERTISEMENTS

All institutions advertising in the AWM NEWSLETTER are **Affirmative Action/Equal Opportunity Employers.** Institutional members of AWM receive two free ads per year. Please see the statement of **Advertisement Guidelines** at the end of this listing. Ads must be prepaid by check or P.O. Institutions are listed in alphabetical order.

## FACULTY POSITIONS

**California Polytechnic State University.** Lecturers, F/T, Math Dept. Salary commensurate with quals. and exper. Avail. (pending funding) for the 1990-91 academic yr. Duties incl. teaching undergrad math courses, incl. some night classes. Doctorate in math req'd. Teaching exper. at a career-oriented univ., or relevent profess'l exper., desirable. For addit'l info. or an app., write to: Dr. Thomas E. Hale, Chair, Mathematics Department, California Polytechnic State University, San Luis Obispo, CA 93407.

**Colby College.** Joint appt. in the Depts. of Admin. Science and Math. Doctorate in business, operations research, math, or other approp. field req'd. Masters in field other than doctorate pref'd (eg, PhD in math combined w/MBA). Competence in at least one of the following necessary: decision theory, math modeling, operations research, stats, comp. sci. Involves teaching math or comp. sci. courses as well as quantitative methods courses in Admin. Sci. One-yr., nontenure-tk. appt. Forward vitae, unofficial grad transcript, and 3 letters of rec. (at least one referring to teaching ability) to Prof. Leonard Reich, Administrative Science Department, Colby College, Waterville, ME 04901.

**Indiana University-Purdue University.** The Dept. of Math Sciences at IUPUI seeks apps for two non-tenure pos. at the Lecturer level beg. Aug. 15, 1990. The initial appt. will be for the academ. yr. 1990-91 with eligibility for annaul reappt. beg. Fall 1991. The normal teaching load is 4 courses/sem. primarily at the pre-calc. level plus service responsibilities. The initial salary is $23,000-26,000 per academ. yr., depending on quals. Fringe benefits incl. participation in TIAA-CREF, and the univ.'s group life and health insurance progs. Min. quals. are a Master's Degree in Math or equiv., and a strong commitment to effective teaching. To apply, submit a resume and a transcript of your academ. record, and arrrange to have 3 letters of ref., at least one of which deals with your teaching, sent by May 15, 1990 to: Prof. Robert Rigdon, Assoc. Chair, Dept. of Mathematical Sciences, Indiana University-Purdue University, 1125 E. 38th St., Indianapolis, IN 46205-2810.

**Russell Sage College.** The Math Dept. has a Fall '90 opening for an Asst. Prof. The successful candidate will have an earned doctorate in math or math ed., excellent communication skills and be dedicated to teaching in the undergrad math curric. Teaching exper. and an interest in the ed. of prospective teachers and comp. sci. and highly desirable. Salary commensurate with credentials and exper. The search will remain open until the pos. is filled. Submit app. materials to: John Hammer, Mathematics, Russell Sage College, Troy, NY 12180.

**Smith College.** The Math Dept. will have a one-yr. visiting pos. for 1990-91 at the rank of entry-level Asst. Prof. Teaching load will be five courses. PhD pref'd. Apps will be accepted until the pos. is filled. Please send vitae and letters addressing both teaching and research to: Dept. of Mathematics Search Committee, Clark Science Center, Smith College, Northampton, MA 01063.

**Southern Illinois University at Carbondale.** Apps are invited from qualified candidates for temp. assignment in Nakajo, Japan. Appts. will be made for one or two semesters beg. in Aug. 1990. A PhD in math is req'd. Selection will be based on demonstrated excellence in teaching undergrads through the calc. Apps are asked to send a letter of app, vita, and 3 letters of ref. (which address the teaching credentials of the candidate) to: Nakajo Position, c/o Ronald B. Kirk, Chair, Dept. of Mathematics, Southern Illinois University, Carbondale, IL 62901. Since these appts. are expected to be made on an ongoing basis, all apps will be kept active unless withdrawn by the applicant.

**Southern Illinois University at Edwardsville.** Apps are invited for one tenure-track and one visiting pos. with rank open beg. Sept. 1990. Only apps who have a doctorate, or equiv. exper, or will complete PhD reqs. by Sept. 1, 1990 will be considered. We seek apps with excellent research accomplishments/potential and a strong commitment to teaching. Salary is competitive and based on quals. and exper. Direct inquiries to Search Committee, Dept. of Mathematics and Statistics, SUIE, Edwardsville, IL 62026-1653.

**State University of New York, Oswego.** Academic Tutor - Work in a Math Skills Ctr. with 2 other F/T professional and more than 40 peer tutors. Duties incl.: teach and tutor developmental and freshman level math courses, coordinate associated lab sessions, train student tutors and coordinate help sessions. Master's degreee in math or math ed. pref'd., teaching exper. preferably at college or pre-college level. Salary competitive. Review of apps will begin April 15, 1990 and continue until pos. is filled. Send letter, resume, 3 letters of ref and official transcripts to: Hubert Smith, Director, Office of Learning Support Services, 34 Swetman Hall, SUNY College at Oswego, Oswego, NY 13126.

University of Pennsylvania. Anticipate one or more tenure pos. beg. July 1, 1991 in the following areas: algebra, anal., geom./topol., discrete math, and logic. These pos. are for candidates with outstanding, internat'ly recognized research achievements who are successful teachers of undergrad and grad students. Rank and salary will depend upon exper. Write to Personnel Committee, Dept. of Mathematics, University of Pennsylvania, Philadelphia, PA 19104-6395.

## Positions of Interest

Mathematical Association of America. Seeking a highly qualified indiv. to fill the pos. of Assoc. Director for Programs (ADP) starting in June 1990 or possibly at a later date. The ADP works in the Washington, DC headquarters of the MAA and oversees math activities of the Assoc., incl. the publications prog. and various MAA projects. The Exec. Dir., the Assoc. Dir. for Admin. and Finance, and the ADP are the central planning and admin. staff team for the Assoc. They bear the responsibility for day-to-day management of the Assoc. business, long-range planning, and outreach to other orgs. They work in close co-op. with the officers of the Assoc., journal editors, committee chairs, and project directors.

Candidate must have a PhD in the math scis. or equiv. stature, substantial teaching exper. in collegiate math, demonstrated ability to work productively with colleagues and committees, and skill in writing and oral presentation. Exper. in prog. mgmt., fund raising, editorial work, and publications production and promotion are not req'd, but are highly desirable.

Salary is negotiable, depending on the quals. and exper. of the candidate. Send a resume and letter of app to: Dr. Marcia P. Sward, Executive Director, The Mathematical Association of America, 1529 18th St., NW, Washington, DC 20036.

Mathematical Association of America. The MAA expects to launch a long-term, comprehensive, nat'l prog. for minorities and math in June 1990 and is seeking a highly qualified project director. This indiv., who will work in the MAA Mathematical Center in Washington, DC, will play a critical role in determining the direction and success of the prog. Quals. for the pos. incl.: PhD in math or math ed or equiv. stature, track record for improving access of minorities to careers in math, science, and engineering, knowledge and appreciation of the probs. that different minority groups have in entering and succeeding in math related fields, excellent organizational and communication skills, and experience in fund raising.

It is expected that by April 15 sufficient funding will be secured so that the MAA can make a commitment to a project director. Salary is negot. depending on the quals. and exper. of the candidate and budgetary constraints. Candidates should send a resume and a letter of app to: Dr. Marcia P. Sward, Executive Director, The Mathematical Association of America, 1529 18th St., NW, Washington, DC 20036.

University of Minnesota, Twin Cities. Apps and noms. are invited for the pos. of Asst. Dir., Office of Patents and Licensing. Desired starting date is July 1, 1990. Annual salary range is $35,000 to $60,000, depending on quals and exper. The Asst. Dir. will rpt. to the Dir. of the Office of P and L. The Asst. Dir. will interact w/Univ. researchers/inventors and w/reps. from corporations both in and out of MN. Responsibilities incl. the admin. of existing licenses, the marketing of new tech., negotiating new licenses, conducting approp. market research relevant to new tech., and decision making concerning the patent feasibility of new inventions. Primary emph. will be on biol. and chem'l sciences tech., w/secondary emph. on elec'l and mech'l engineering tech.

The successful candidate must have a Bachelors degree in bio'l sci., chem., chem'l eng., elec'l eng., mech'l eng., or related fields. Exper. in defining and executing an imaginative marketing plan for a given tech. and in negot. and drafting license agreements in either and academ. or indust. setting is essential. Some familiarity w/patent laws is pref'd. This pos. reqs. the ability to work well w/others, a self-starter, good attention to detail, follow-through, good writing skills, and a willingness to travel. Capability to work into managing others in their licensing efforts is desired.

Interested persons should send 1) letter of app incl. a discussion of exper. and accomplishments relevant to this pos., 2) a resume, and 3) the names, addresses and phone #s of 3 refs. All apps must be rec'd by May 31, 1990 and should be directed to: Deborah T. McWatters, University of Minnesota, Sathe & Associates, Inc., 5821 Cedar Lake Rd., St. Louis Park, MN 55416.

# Programs of Interest

**University of Florida - Graduate Studies in Mathematics**

The University of Florida's Department of Mathematics is continually interested in receiving applications from all qualified individuals. We are a vigorously growing department in regards to both the quality and size of our faculty and graduate student body, and the University and its environs offer superb opportunities for intellectual, cultural, and recreational activities.

The distinguished faculty directs research in virtually all areas of modern mathematics leading to the M.A., M.S., and Ph.D. degrees. Strong areas of research include combinatorics and finite geometries, differential geometry and mathematical physics, dynamical systems and topology, group theory and representations of finite groups, logic, numerical analysis, and probability.

Fellowships and assistantships are available to qualified applicants. Teaching assistants next year will receive at least $8600 and nearly all tuition will be waived; outstanding applicants may also receive a $2000 supplemental fellowship. In addition to academic-year support, summer teaching assistantships are also available. For additional information and applications, write to: Dr. Louis Block Graduate Coordinator, Department of Mathematics, University of Florida, Gainesville, Florida 32611

## THE MARSHALL HALL 80TH BIRTHDAY CONFERENCE ON
## CODING THEORY, DESIGN THEORY AND GROUP THEORY

### UNIVERSITY OF VERMONT

### SEPTEMBER 13 - 18, 1990

This conference will honor Marshall Hall's lifelong contributions to coding theory, design theory and group theory by bringing together top researchers in these areas with the purpose of discussing the latest advances and promoting interdisciplinary research. The Conference will feature hour lectures by invited speakers as well as several sessions of contributed papers.

The invited speakers are:

| | |
|---|---|
| J. Alperin (Chicago) | A. Bruen (Western Ontario) |
| P. Cameron (London) | J. Conway (Princeton) |
| J. Dillon (Dept. of Defense) | W. Feit (Yale) |
| D. Gorenstein (Rutgers) | J. Hall (Michigan State) |
| G. Higman (Oxford) | W. Kantor (Oregon) |
| D. Knuth (Stanford) | J. van Lint (Eindhoven) |
| R. McEliece (Caltech) | R. Mullin (Waterloo) |
| D. Ray-Chaudhuri (Ohio State) | G. Seitz (Oregon) |
| L. Teirlinck (Auburn) | C. Praeger |
| J. Thompson (Cambridge) | R. Wilson (Caltech) |

The organizing committee consists of:

K. Arasu (Wright State), M. Ashbacher (Caltech), J. Dinitz (Vermont)
R. Foote (Vermont), D. Jungnickel (Giessen), and S. Vanstone (Waterloo)

Graduate students are encouraged to attend and we anticipate some support being available.

For more information please write to:

Marshall Hall Conference
Department of Mathematics and Statistics, University of Vermont
16 Colchester Avenue, Burlington, VT 05405

MATHEMATICAL SCIENCES RESEARCH INSTITUTE
1000 Centennial Drive,  Berkeley, California, 94720

The Institute solicits applications for membership in the Institute
for the 1991-92 year, which begins on September 3, 1991.  In 1991-92
two programs will be featured.  Although these two areas will be
emphasized, applications from candidates in all fields will be
welcome.

**LIE GROUPS AND ERGODIC THEORY WITH APPLICATIONS TO NUMBER THEORY AND GEOMETRY.**
Topics will include:
1. Flows on homogeneous spaces with applications to number theory.
2. Actions on algebraic homogenous spaces and boundaries.
3. Smooth actions of semisimple groups and discrete subgroups, with
   applications to geometric structures.
4. Representations and arithmetic properties of fundamental groups.
5. Non-positively curved manifolds and symmetric spaces.
The program committee consists of H. Furstenberg, M. Ratner, P.
Sarnak, and R. Zimmer (Chairman).

STATISTICS
The topics of this program include:
1. Empirical and related processes and applications including
   a) Gaussian processes and probability on Banach spaces,
   b) Econometric modelling,
   c) Neural networks.
The topic organizers are L. Le Cam and D. Pollard.
2. Resampling and other computer intensive methods.
The topic organizers are R. Beran, B. Efron, J. Friedman.
3. Non and semiparametric models and survival analysis.
The topic organizers are P. Bickel, R.D. Gill.
In addition there will be two workshops:
4. Statistical methods in imaging to be organized by B. Silverman.
5. Statistical methods in molecular biology to be organized by M. Waterman.
The program committee consists of P.J. Bickel (Chairman), L. Le Cam,
D. Siegmund and T. Speed.

POSTDOCTORAL FELLOWSHIPS
We anticipate making approximately 20 awards of postdoctoral
fellowships.  The stipend for 1990-91 is $30,000 and it will be at
least that for 1991-92.  In addition there is an award for round trip
travel.  The candidate's Ph.D. should be 1986 or later.  Candidates
are asked to solicit three letters of recommendation.  Most awards are
for a year, but a shorter period is possible.  The deadline for
applications is November 30, 1990.

SENIOR MEMBERSHIPS
For mathematicians whose Ph.D. is 1985 or earlier, applications are
invited for part or all of 1991-92.  Letters of recommendation are
encouraged but not required.  It is generally expected that members at
this level will come with partial or full support from other sources.
The deadline for applications is November 30, 1990.

RESEARCH PROFESSORSHIPS
Please see the separate announcement of these awards; it will appear
both as an advertisement in the AMS Notices and as a poster.  There is
an earlier deadline for applications: October 1, 1990.

**FURTHER REMARKS**

Each application should include an up-to-date vita and bibliography
and a statement of research plans. The Institute does not use formal
application forms. However, an information sheet giving additional
suggestions to prospective applicants is available upon request.
Write to the Mathematical Sciences Research Institute, 1000 Centennial
Drive, Berkeley CA 94720. Women and minority candidates are
especially encouraged to apply. Candidates are asked to make sure
that their application materials and letters of reference arrive by
the deadline (October 1, 1990 for Research Professorships and November
30, 1990 for the others). Late applications cannot be assured a
complete consideration. Awards will be announced by early December,
1990 for Research Professorships and by mid-February, 1991 for the
others.

There will be a program in Mathematical Biology in the summer of 1992;
aa separate announcement will be issued, probably in the fall of 1990.
In 1992-93 there will be three programs: Algebraic Geometry for the
whole year, Symbolic Dynamics for the first half of the year, and
Transcendence and Diophantine Problems for the second half of the
year. Suggestions for future programs are welcome.

# ADVERTISEMENT GUIDELINES

AWM will accept advertisements for the AWM 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 Executive Director, in consultation with the President and the
Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these
guidelines. **All institutions and programs advertising in the Newsletter must be Affirmative
Action/Equal Opportunity designated.**

**Institutional members of AWM receive two free ads per year.** All other ads are $20 each for the first
eight lines of type. Ads longer than eight lines will be an additional $15 for each eight lines or fraction thereof (i.e., $35 for
9-16 lines, $50 for 17-24 lines, etc.)

# Don't forget to

# RENEW YOUR AWM MEMBERSHIP!

## and

## Encourage your institutions to become Institutional Members

### and nominate student members....

# Association for Women in Mathematics

## MEMBERSHIP FORM

Name: _____

Mailing Address _____

_____

Institutional Affiliation (if any) _____

Telephone Numbers (home) _____

(office) _____

Electronic mail address (if any) _____

Renewal _____ New Member _____ (check one)

Address change? _____

## Amount Enclosed

Individual dues are based on annual income

Family membership _____

# Association for Women in Mathematics

## MEMBERSHIP FORM

Name: _____

Mailing Address: _____

_____

Institutional affiliation (if any): _____

Telephone numbers:  Home: (     )_____

Office: (     )_____

Electronic mail address (if any): _____

*Renewal* _____ *New Member* _____ (check one).

Address change? _____

## Circle Amount Enclosed

*Individual*: $20,  *Family*: $25,  *Student, Retired, Unemployed*: $5
*New member rate*:  $15 for each of the first two years
*Foreign members*, other than Canada and Mexico:  add $8 for postage

*Contributing Member*: $25 plus dues
Contributions of any size very welcome.

*Institutional members* receive two free advertisements per year in the AWM Newsletter.
    *Sponsoring, Category I* (may nominate 10 students for
    membership):   $100
    *Sponsoring, Category II* (may nominate 5 students for
    membership):   $75
    *Regular*: $50

Note:   AWM membership year is October 1 to October 1

# Association for Women in Mathematics

NEWSLETTER

ASSOCIATION FOR WOMEN IN MATHEMATICS
Box 178, Wellesley College
Wellesley, MA 02181

MAY - JUNE 1990