Association for Women in Mathematics

PRESIDENT'S REPORT

Before I begin with the official business of my "first" president's report, I would like to thank Rhonda Hughes for the delightful tradition she started of inaugurating the new AWM president by passing on the AMS Centennial Bowl. This was done with much ceremony at the Phoenix meeting before the start of the business meeting. I am looking forward to the next two years, and hope that those of you whom I don't yet know will introduce yourselves at meetings or contact me by mail or email (mesirov@think.com) and let me know your ideas for AWM in the 90's.

Phoenix was an exciting and interesting meeting. The AWM panel on "Gender Differences in Mathematical Ability — Performance vs. Perceptions" was both well attended and well received. I would like to thank our panelists, Gila Hanna and Pat Rogers, again for their informative talks and for agreeing to contribute a summary of their remarks and a list of references to the *Newsletter* [to appear soon]. Mary Wheeler was the Noether lecturer, and her talk, "Large scale modeling of problems arising in flow in porous media," was excellent.

The meeting of the Executive Committee in Phoenix was a busy one. We voted to endorse the new NCTM Curriculum and Evaluation Standards for School Mathematics. A long-range planning committee was established. Tricia Cross, our new Executive Director, was directed to investigate possible alternatives to our current October to October membership year. Institutional membership dues were raised. Some changes were made to the *Newsletter* ad policy, including broadening the guidelines for acceptance, and these will appear in a future issue of the *Newsletter*. We agreed to seek to have an official presence at the SIAM national meeting in the same way that we do at the AMS/MAA joint meetings. A prize was established for the top woman competitor in mathematics at the International Science and Engineering Fair.

Three projects were targeted for fundraising activities. First, we hope to create an AWM resource center, including a revitalized speakers' bureau, at our office at Wellesley. Funds will be sought to support the operation of the center as well as to support the efforts of rewriting and expanding our resource materials. We will seek monies to continue to support Kovalevsky High School Math Days throughout the country. Finally, we hope to raise money to help defray the expenses of our invited speakers, i.e., those who participate in AWM panels and the Noether Lecture.

At the end of our meeting Rhonda Hughes made the following two motions, which were immediately seconded and passed.

1. The Executive Committee of the AWM expresses its deep gratitude to Alice T. Schafer for the many years of service she has given to AWM. We wish her and Dick well in their move.

2. That the Alice T. Schafer Mathematics Prize be awarded annually, beginning in 1990, to an undergraduate woman for excellence in mathematics. A committee will be established to determine the appropriate context of the award. AWM will place $5,000 in an award fund and will attempt to match that amount with contributions.

Alice was both surprised and pleased! At the beginning of the AWM panel, Bettye Anne Case formally announced the new prize and presented Alice with a plaque. The text of Bettye Anne's remarks appears below. The prize committee will consist of Lenore Blum, Bhama Srinivasan, and Alice herself.

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ALICE T. SCHAFER MATHEMATICS PRIZE

remarks of Bettye Anne Case, AWM business meeting, Phoenix

At its meeting today, the Executive Committee voted to establish a mathematics prize to be awarded to an undergraduate woman honoring Alice Turner Schafer. As a professor and department chair at Wellesley College, Alice devoted much energy to developing the talents of young women as mathematicians. Hence I felt that Rhonda Hughes' idea for this way to say thank you to Alice was especially appropriate.

Just as she was a role model to us in her years at Wellesley, now — still teaching, chairing committees, leading the mathematics People-to-People delegation to China this summer — she continues to show us how much one person can accomplish. When we need help with our own projects, she has the answers and shares them generously. From the time she set up the AWM office as our second president until she moved from the Boston area this fall, Alice has nurtured the sometimes unglamorous process of effectively running an organization on a shoestring. To the successive AWM presidents, Alice has been the most valued of advisors.

Rhonda's resolutions today read:

Resolution 1: The Executive Committee of the AWM expresses its deep gratitude to Alice T. Schafer for the many years of service she has given to AWM. We wish her and Dick well in their move.

Resolution 2: That the Alice T. Schafer Mathematics Prize be awarded annually, beginning in 1990, to an undergraduate woman for excellence in mathematics.

As a token of our recognition of Alice's contributions, we wish to present this plaque.

[Text of plaque:] The members of the Association acknowledge with deep gratitude the contributions of Alice T. Schafer, president 1973-1975, who for nearly two decades has given devoted service and valued guidance to our organization.

Thank you, Alice.

OPINION: AMERICA'S SCIENTIFIC FUTURE

An Opinion article in the January 11, 1989 issue of *The Chronicle of Higher Education* was written by Edward A. Connors, professor of mathematics at the University of Massachusetts at Amherst and chairman of the Committee on Employment and Educational Policy of the American Mathematical Society and the Mathematical Association of America. Entitled "America's Scientific Future Is Threatened by the Decline in Mathematical Education," it includes the statement "[w]e should dispel, once and for all, the nonsensical notion that mathematics is a man's game. The appearance of more women in mathematics in recent years is encouraging, but we need to do better in publicizing their successes." (It is interesting that the first of the two sentences quoted was chosen for separate display on the page.) The message that "[t]he nation needs to establish a strong commitment to excellence in mathematics education" is well conveyed.

AWM ELECTION

Reminder: This year we will be choosing a President-Elect and three At-Large Members of the Executive Committee. The Nominating Committee consists of Bhama Srinivasan (chair), Linda Keen, and Vivienne Malone-Mayes. Members' suggestions for candidates are welcome and should be made to the President by April first. A list of the current Executive Committee members follows.

AWM EXECUTIVE COMMITTEE, 1989

President: Jill Mesirov, Senior Scientist, Thinking Machines Corporation

Past President: Rhonda Hughes, Professor & Chair, Department of Mathematics, Bryn Mawr College

Treasurer: Jenny A. Baglivo, Associate Professor, Mathematics Department, Boston College

Members-at-Large:

Lisa R. Goldberg, Member, School of Mathematics, Institute for Advanced Study

Rebecca Herb, Professor, Department of Mathematics, University of Maryland

Tilla Klotz Milnor, Professor, Department of Mathematics, Rutgers University

Ruth Rebekka Struik, Professor, Mathematics Department, University of Colorado

Carol Wood, Professor, Department of Mathematics, Wesleyan University

Newsletter Editor: Anne Leggett, Associate Professor, Department of Mathematical Sciences, Loyola University of Chicago

Meetings Coordinator: Bettye Anne Case, Associate Professor, Department of Mathematics, Florida State University

Clerk: Martha Jaffe, Software Engineer, Prime Computer, Natick, Massachusetts

AWARDS AND HONORS

Congratulations to Beverly Diamond, College of Charleston. This academic year she has an American Association of University Women fellowship to pursue mathematical research.

Professor Olga Oleinik, Head of the Department of Differential Equations, Moscow State University, was awarded a USSR State Prize for her achievements in mathematical research. She was elected also to the Academy of the Lincei (founded in 1603). Professor Olga Ladyzhenskaia of Leningrad was elected at the same time to the Academy of the Lincei. Both participated in the ceremonies in Rome on November 26 when the President of the Republic of Italy presented them with the insignia and documents of membership in this prestigious Academy.

Neyssa Isabel Calderón Calero, student of mathematics at the National Autonomous University of Nicaragua, received one of the two 1988 Nicaraguan Kovalevskaia Prizes. Her prize request was a computer, which was delivered in June.

Two of the three Nicaraguan daily newspapers carried articles about her prize (*La Prensa* did not). *El Nuevo Diario* featured a detailed interview with her, and her picture appeared on the front page of that issue. The interview ends with the observation that Neyssa, with her love of mathematics, "refutes the myth that of the Nicaraguan population a million and a half are poets, and the remaining million and a half also want to be poets."

Carol N. Harrison, assistant professor of mathematical sciences at Susquehanna University, is a 1988-1989 Fulbright Scholar. She is spending the year in Liberia. The Council for International Exchange of Scholars administers the Fulbright program in cooperation with the United States Information Agency.

REPORT OF THE TREASURER   DECEMBER 1988

Accounting for the period June 1, 1988 through December 15, 1988

Balance as of June 1, 1988	$51,837.54
Washington Water Power, 5 shares valued at	111.88
Total Assets as of June 1, 1988	$51,949.40

RECEIPTS

Dues:	Individual	$19,478.24
	Family	1,365.00
	Institutional	7,880.00
NSF Travel Grant[1]		10,000.00
EXXON Education Foundation Grant for AWM[2]		10,000.00
Contribution to AWM to support the China Delegation		5,000.00
Purchases		67.70
Interest Income		1,191.10
Advertising Fees		450.00
Contributions		995.45
Miscellaneous		31.10
Total Receipts		**$56,458.59**

EXPENSES

Wages and Benefits for Executive Director[3]	$12,762.33
Newsletter expenses: CBS printing	7,387.00
Operating Expenses	4,277.80
AWM National Meetings	2,635.12
Dues & Fees: CBMS, Massachusetts Incorporation Fee	170.00
Consultant: C.P.A.	390.00
Bulk Mail	500.00
Speakers Bureau	125.77
AWM-Simmons Sonia Kovalevsky Day 1988	2,477.64
AWM-Simmons Summer Institute 1988	6,000.00
AWM-NSF Travel Grants	3,418.65
EXXON Grant expenses for Panelists at Phoenix Meeting	882.67
Total Expenses	**$41,026.98**

BALANCE as of December 15, 1988	**$67,269.15**

[1]This advance will cover expenses for the first half-year of the AWM-NSF Travel Grant Program.
[2]The EXXON Grant will be used to cover Sonia Kovalevsky High School Days expenses, and to cover expenses for panelists at National Meetings.
[3]This amount is less expenses charged to NSF Travel Grant and EXXON Grant.

Respectfully submitted,

Jenny A. Baglivo, Treasurer
Mathematics Department
Boston College
Chestnut Hill, MA 02167

BOOK REVIEW COLUMN

Women's Voices, ed. Lorna Duphiney Edmundson, Judith P. Saunders, and Ellen S. Silber, Marymount College, Tarrytown, NY, Copley Publishing Group, Littleton, MA 04160, 1987.
Reviewer: Bonnie Shulman, University of Colorado

If we are to believe history books, until the beginning of the twentieth century, women were sometimes seen, but rarely heard, and almost never listened to. *Women's Voices*, a collection of papers presented at a three-day conference ("Voices of Women") in 1985 at Marymount College, explores some of the causes and consequences of this silence.

Carolyn Heilbrun claims we live our lives through texts. Since authors have (until recently) been mostly men, women have been living by a script they did not write. To them has been given the marriage plot, never, as for men, the quest plot. This helps explain why it has been so difficult for women to enter and to survive in non-traditional fields of work and study. We do not forge a destiny we cannot imagine. Heilbrun also stresses the importance of female friendships and mutual support in the world of work and achievement. Truly to compete means to strive together, and in this spirit it is good to compete. She enjoins us to invent new fictions and forsake old myths — "consolatory nonsense."

Exiling women's voices to the fringes of society has given women a perspective unlike that of those living at the center. Thus female outlaws, as Keane, Saunders and Silber point out, are often characters whose inner voices of conscience call on them to move not so much against the law as beyond it. Women must learn, in a culture bent on eradicating passion outside certain strict limits, to value their own intense capacity for feeling, to speak out for what they passionately believe in, and to seize and hold their place in the world.

What we say and how we say it really does make a difference. In "Public Prayer Talk," Catherine Vincie emphasizes the power of our speech-acts and the creative role of language in building a new world. It is no small step, then, to move beyond sexist language in our textbooks. Vincie encourages us to move even further by concerning ourselves with critique, retrieval and reconstruction. As women mathematicians, our critique should debunk women's alleged incapacity to think abstractly and our "peculiar ... household instincts;" retrieval must include gathering the fragments of our tradition, especially the biographies and works of women in mathematics; and reconstruction must mean nothing less than a transformation of the mathematical community, the creation of one inclusive of full humanity and the capabilities of both women and men.

The silence of women students has cheated us out of their different perspective, a perspective often missing in mathematics classes today. Many studies confirm that most women students tend to try to understand an idea by understanding the experience that gave rise to it. They are not satisfied with the typical professor's presentation of definition–theorem–proof, or problem–solution, that is currently so popular. For these women, and many men, the purpose is not to prove or disprove a proposition, but to understand the person's thinking and what experiences led them to think that way. In addition women want us to be more than just fair to their thinking, but also to care for it and help it grow. Blythe Clinchy encourages us, both as teachers and students, to violate the traditions of many of our institutions and nurture each other.

For me, the most interesting comments made in the papers were those on education. In "No More Flax," a powerful diatribe against current pedagogy, Nancy Barnes borrows a very effective metaphor from James Herndon to describe the worst of institutional schooling — "always and inescapably political." Herndon, writing about his early schooling, says "I never knew what flax was but I knew that if I kept it in mind and wrote it down a lot and raised my hand and said it a lot, I would be making it." Barnes carries this further:

> Learning flax is learning something essentially external, that was chosen by people you will never know, to serve purposes that they will never have to tell you. ...
> Studying flax requires you to put aside the things that you do know about, and may have real questions about, like corn, and to turn your attention to something totally outside your own experience.

Feminist teachers insist it is especially important that women be taught that they *can* understand theory and they *can* do analysis so they may connect their everyday lives with an analysis of the social institutions which shape them. It is also important that women study mathematics to enable them to study other technical subjects. Historically, women have had disastrously little say in the decisions affecting the direction and implementation of technology. In order to take part in this discussion, women must become involved with the future of technology and understand its language.

If, in math classes, students are taught the *process* of problem-solving, not just the solution, perhaps they will be better prepared to solve real-life problems. If they learn, as Maryam Hastings reminds us, "that the solution to a problem is not a simple straight path but a wandering course with many dead ends and turns," they may be able to find realistic answers to some of the serious questions we face.

The papers in this collection provide valuable insights into the "different voice(s)" emerging from women. Here are women writing their own texts, expressing viewpoints truly different from those of the "mainstream" in their respective disciplines. The final comments, delivered by a student who attended the conference, confirm my own feelings after reading this book: that a door has been cracked open. I imagine that we have a toe in the jamb and have peeked through the crack with one eye and seen the sky. We must each take it upon ourselves to see that the door is kept open, and that more and more women speak out and *are heard*.

At the AMS Centennial celebration in Providence, many mathematicians voiced their reservations about the *existence* of a 21st century, even as they spoke of the unsolved problems mathematicians might tackle in the next hundred years. We must all speak up and listen carefully to *all* voices in order to make the crucial decisions that will enable us to survive into a *unique* 21st century.

WOMEN AND MATHEMATICS: Balancing the Equation, edited by Susan F. Chipman, Lorelei R. Brush, and Donna M. Wilson, Lawrence Erlbaum Associates, Publishers, Hillsdale, NJ, 1985, $39.95, ISBN 0-89859-369-7.
Reviewer: Pat Kenschaft, Montclair State College

This is a book that should be in every library, on every Women's Issues bibliography, and read at least casually by every speaker on women in mathematics. It is a compendium of twelve erudite, detailed studies. They are tough reading, but together are an important reference for AWM members. The book would be a fine text. Many of the authors' names are well known to regular *Newsletter* readers, and familiar names keep popping up in the essays. There are plenty of hard data to corroborate the tenets of AWM, complete with statistics and careful descriptions of how the statistics were gathered scrupulously via accepted techniques of the social sciences.

The first chapter, "Outlining the Problem," states that although the fraction of women among undergraduate majors in the U.S. is now approaching one-half, this misrepresents the problem: the percentage of women in other math-based majors is much lower, and women's share of doctoral degrees in mathematics is much lower than their share of bachelor's degrees. There are serious but difficult questions about whether mathematics is a real or arbitrary "filter," and, if real, how the mathematical capacity of older workers (in particular, the women who in high school in the 1950's and 1960's were vastly underprepared in mathematics) can be upgraded.

A list of the other chapter titles follows: "Mathematics Course Preparation in the 1960's and its Career Consequences," "A National Assessment of Participation and Achievement of Women in Mathematics," "Self-Perceptions, Task Perceptions, Socializing Influences, and the Decision to Enroll in Mathematics," "Cognitive and Affective Determinants of Course Preferences and Plans," "Visual-Spatial Skill: Is it Important for Mathematics? Can it be Taught?", "The Influence of Sex-Role Stereotyping on Women's Attitudes and Achievement in Mathematics," "School, Classroom, and Home Influences on Women's Decisions to Enroll in Advanced Mathematics Courses," "Factors Related to Young Women's Persistence and Achievement in Advanced Placement Mathematics," "The Impact of Early Intervention Programs Upon Course-Taking and Attitudes in High School," "Understanding Mathematics Course Enrollment and Mathematics Achievement: A Synthesis of the Research," and "Strategies to Increase Mathematics Enrollments."

The major disadvantage of any such book is that it is frozen in time, and the annual data quickly go out of date. This can be remedied by using the book in conjunction with the NSF publication *Women and Minorities in Science and Engineering*, a new edition of which is published in January of even years and which is available free by calling 202-357-9859. Together, *Women and Mathematics* and the current statistics can help anyone become an informed spokesperson for equal opportunity for women in mathematics-based fields.

Book Review Editor:
Martha Smith
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TERCENTENARY OF THE *MATHEMATISCHE GESELLSCHAFT IN HAMBURG*

The *Mathematische Gesellschaft*, founded in 1690 and considered to be the world's oldest existing mathematical society, would like to invite members of AWM to attend their Third Centenary Celebration in Hamburg during March 18 - 24, 1990. The convention, organized by the *Gesellschaft* in cooperation with the Departments of Mathematics, Physics, and Computer Science and the Computing Center of the University of Hamburg, has been designed to bring together mathematicians in various fields of the mathematical sciences to discuss recent main developments, results, and problems. The conference will include invited and contributed papers as well as short communications.

Authors of papers should submit two copies (two to three pages) prior to October 1, 1989; authors of short communications, two copies of an abstract (not more than twenty lines) before February 1, 1990. Papers will be reviewed and published in *Mitteilungen der Mathematischen Gesellschaft in Hamburg*. If possible, manuscripts should be handed in at the beginning of the meeting.

Abstracts and requests for information should be addressed to: Mathematische Gesellschaft in Hamburg, Geschäftsstelle; Bundesstraße 55, 2000 Hamburg 13; Federal Republic of Germany.

AWM EDUCATION COMMITTEE COLUMN: More about Programs for Girls

Leading Girls to Mathematics, Science and Technology, a new program from the Girl Scouts of the United States of America
by Ann E. Moskol, Rhode Island College

To encourage girls to pursue mathematics and science, the Girl Scouts have published a resource booklet, "Leading Girls to Mathematics, Science and Technology" by Sharon Woods Hussey, director of GSUSA's program department. Produced with the assistance of a grant from The Weyerhaeuser Company Foundation, the booklet stresses the importance of girls studying math and science in our technologically oriented world. Although females do not traditionally enter mathematics and science in numbers comparable to males, the booklet cites a National Science Foundation survey that found "a positive correlation between learning experiences and later achievement in mathematics and science" (Hussey, 1987, p. 7). Girl Scouts can provide leadership in helping girls overcome fears and social influences that prevent them from pursuing math and science careers.

Specific tips for Girl Scout Leaders include: 1) providing positive reinforcement, 2) encouraging the development of mathematical and scientific skills, 3) helping make mathematics/science study more interesting, attractive, and relevant, and 4) being an advocate. The manual suggests troop/group activities such as: 1) earning specific Girl Scout badges, 2) building something that meets a challenge, 3) watching relevant television series such as *Nova, Square One*, and *3-2-1 Contact*, 4) trying activities in the "Computer and You" and "Girls + Math = Fun" inserts included in the booklet, 5) doing puzzle-

solving activities, 6) putting on a science/math magic show, 7) making a toy that uses science or math, 8) visiting museums and other science centers (which are listed by states as a reference), and 9) trying some kitchen chemistry experiments.

The booklet also includes statistics on percentages of women who are working in various fields, along with average salary earnings; these are helpful in motivating discussion on the importance of studying mathematics and science. A list of specific role models and activities to promote discussions on career opportunities are also provided.

The Girl Scouts should be commended for providing leadership in encouraging girls to study more mathematics, science and technology. If you would like more information about the program, you should contact: Program, Girl Scouts of the U.S.A., 830 Third Avenue, New York, NY 10022.

Reference: Hussey, Sharon Woods. *Contemporary Issues: Leading Girls to Mathematics, Science and Technology.* New York: Girl Scouts of America, 1987.

Operation SMART, a program of the Girls Clubs of America

Ellen Wahl, Director of Operation SMART, described the program in a letter of May 23, 1988, as follows:

> Operation SMART is a project to design ways to involve girls from all backgrounds in science, math, and relevant technology (SMART). Most good jobs nowadays in any field require facility with math, science, and computers, yet girls and women are tracked out of math and science in school and in the work world. The historical mission of Girls Clubs of America is to prepare girls for responsible adulthood and economic independence. Through Operation SMART, we hope to help increase the participation of women and girls in math and science.

> Operation SMART began in 1985 at several local Clubs in Massachusetts and upstate New York, where science and math activities for girls were developed and evaluated in informal, afterschool settings. Thousands of girls participated in the project during its first three years. In the coming year, SMART programs will begin in Girls Clubs across the country.

> To date Operation SMART has developed programs for girls ages 6-14, and programs for girls ages 15-18 are in the planning stage. In the past year, Operation SMART has been working with science centers and museums, a wonderful hands-on resource, in a project called MuseumLink. By late spring or early summer we expect to have produced a guide to program implementation, a guide to activities, and a videotape.

> Operation SMART is administered by the national offices of the Girls Clubs of America in New York City, and is funded by the National Science Foundation, the Ford Foundation, the Carnegie Corporation of New York, the General Electric Foundation, and other corporations and foundations.

Operation SMART has a research component, which includes data collection at the model Clubs, case studies, and ethnographic analyses. The research is conducted by GCA's National Resource Center. In her letter of December 22, 1988, Mary Jo Gallo (Director of Communications) described one product of the National Resource Center, the Operation SMART Research Tool Kit, a set of materials for 13 "evaluation activities girls conduct to assess... each other's attitudes, plans, and aspirations about science and math. Designed for Girls' Clubs, community-based organizations, and schools, the Research Tool Kit is intended for use with 9- to 14- year-old girls, but it can also be used with boys or in co-ed settings."

For further information, contact Girls Clubs of America, Inc., at 30 East 33rd St., New York, NY 10016, (212) 689-3700 or the GCA National Resource Center, at 441 West Michigan St., Indianapolis, IN 46202, (317) 634-7546.

Intervention Programs in Mathematics, Science, and Computer Science for Minority and Female Students in Grades Four Through Eight
Reviewed by Susan Gordan Marchand, AT&T-Bell Labs

The booklet "Intervention Programs in Mathematics, Science and Computer Science for Minority and Female Students in Grades Four Through Eight" was written by Beatriz Chu Clewell, Margaret E. Thorpe, and Bernice Taylor Anderson. It was produced with support from the Ford Foundation. It was printed by and is available from Educational Testing Service, Princeton, NJ 08541.

Of 120 pages, there are eight pages of introduction, describing how the programs were identified, verified, etc., and another 10 pages of findings, in statistical summary and paragraph form.

A two-page bibliography ranges from 1976 articles by Fennema and Fox through 1985 articles in *Science Education* and an ETS report to the Ford Foundation.

Each of 163 programs provided information which included administrative matters (name, address, phone, program director), scheduling (in school/after school/summer/1-day conference), grade levels, target populations (females/minorities/all students), subject matter (math/science/computer science) and types of student experiences (guest speakers/experiments/mentoring/field trips/job shadowing/tutoring/contests).

It seems to me, without in-depth analysis, that the authors' concern was with the letter of the requirements for inclusion rather than the spirit, and much can be missed because of that. Programs omitted from the report were deemed inappropriate because of reasons such as not serving students in grades 4-8, or not targeting minority students. But a program that was included had *one* student in grades 6-8 and all others in higher grades. Again, several programs which were included listed minorities as the target group, but provided no detailed information under Ethnicity/Race. Programs which described themselves as "national" in scope were entered with an asterisk in the self-description section. They were included only in the state in which the program director is resident, even though the program operates in several parts of the country. This throws off the summary data presented for the West, Central, Northeast, and Southeast.

The most helpful aspect of the booklet is that it is organized by state, alphabetically, and anyone interested in starting a program could find a person with whom to discuss what success that program has had.

Reader Survey: Do you have recent information about new or old programs for women in math? Please keep us informed. Thanks! Write to AWM Education Committee, c/o Sally I. Lipsey, 70 E. 10th St., #3A, New York, NY 10003.

EQUALS AND FAMILY MATH

from the WME (Women & Mathematics Education) newsletter, November, 1988

EQUALS is a mathematics inservice program located at the Lawrence Hall of Science, University of California, Berkeley, with a special focus on equitable mathematics education opportunities for all, especially female and minority students. FAMILY MATH provides inservice for teaching children and their parents to do mathematics together. In case you are not familiar with the materials published by these programs, they are listed below. To order, send check made payable to The Regents, University of California, and mail to EQUALS, Lawrence Hall of Science, University of California, Berkeley, CA 94720. (California residents must add applicable sales tax.) Purchase orders are accepted with a minimum of $25 per order. Shipping and handling is $2 per book. For more information, call (415) 642-1823.

Get It Together (available April, 1989) is a book of problems to be solved cooperatively by groups of 4-6 students, including logic, number, algebra, spatial, probability, and other mathematical topics. Grades 4-Adult, 100+ pages, $15.

The *FAMILY MATH* book includes the complete FAMILY MATH curriculum with activities for families to do at home or in classes with other families. (1986) Pre-K-Adult, 318 pp. $15 (also in Spanish).

We All Count in FAMILY MATH is a 17-minute film or video with scenes from FAMILY MATH classes. Available for rent ($25) or purchase ($225 for 16 mm or $60 for 1/2" VHS).

Off and Running is a collection of EQUALS in Computer Technology off-line activities, including procedural thinking, planning, logic, default instructions, etc., with a focus on access and equitable computer use for all students. (1986) Grades 4-12, 145 pp. $12.50.

Parents, Kids, and Computers gives parents advice on selecting and using computers and computer software with their children. (1984) 145 pp. $4.95.

Use EQUALS to Promote the Participation of Women in Mathematics is the handbook that describes the EQUALS in Mathematics program, with methods and activities for elementary, secondary, and preservice courses, including an annotated bibliography. (1980) 136 pp. $7.50.

I'm Madly in Love with Electricity and Other Comments About Their Work by Women in Science and Engineering is a book of photographs and comments from women scientists, engineers, and mathematicians. (1979) 40 pp. $2.

SPACES: Solving Problems of Access to Careers in Engineering and Science has classroom activities using mathematics and career information to develop problem-solving abilities. (1982) Grades 4-10, 141 pp. $13.50.

BEYOND EQUALS includes function machines, problem solving, arithmetic, algebra, logic, and spatial games intended for use with adult women. (1982) 149 pp. $10.

Math for Girls and Other Problem Solvers consists of the curriculum from the Lawrence Hall of Science course, with student activities and game sheets. (1981) Grades K-8, 107 pp. $10.

VERA NIKOLAEVNA MASLENNIKOVA (ON HER SIXTIETH BIRTHDAY)

Professor Vera Nikolaevna Maslennikova, Doctor of Physical and Mathematical Sciences, was born on 29 April 1926. In the autumn of 1941 she took part in the defence of Moscow, then she served in the anti-aircraft division. For her part in the Great Patriotic War she was awarded the Order of the Patriotic War and medals.

In the autumn of 1944 she returned to continue her studies and after graduating from the middle school with a gold medal she enrolled in the Faculty of Mechanics and Mathematics of the University of Moscow. Her first teacher at Moscow University was Gel'fond, and under his supervision she finished her diploma work. After graduating from Moscow University she enrolled as a graduate student at the Steklov Mathematical Institute. There her supervisor was Sobolev.

In her Ph.D. thesis she discovered and studied fundamental solutions of initial boundary-value problems for systems of hydrodynamics of rotating fluids with regard to compressibility. After finishing her research she began work in the same Institute in the department of partial differential equations, of which Sobolev was then head. For 22 years her work was associated with the Steklov Institute of Mathematics. Since 1975 she has held the chair of differential equations and functional analysis at the Patrice Lumumba University.

She has obtained results in the theory of partial differential equations, in the mathematical hydrodynamics of rotating fluids, and in function spaces, and has published more than 80 papers.

A long series of papers deals with the study of boundary-value problems for parabolic equations and a study of the properties of their solutions. She established the maximum principle for parabolic equations with discontinuous coefficients, and she obtained a priori Schauder-type estimates in Hölder classes for solutions of initial boundary-value problems for a parabolic equation with minimal requirements on the smoothness of the coefficients and on the input data in domains varying with time.

For multi-component quasi-linear diffusion systems she studied initial boundary-value problems, established the maximum principle in the form of comparison theorems, proved theorems on the existence and uniqueness of solutions, and gave approximate methods for finding them.

She studied the behaviour of solutions with unlimited increase of time for different linearized systems of hydrodynamics of a rotating liquid both with regard to and ignoring compressibility and viscosity, and obtained asymptotic estimates for the solution of the Cauchy problem, exact with respect to the order of decrease as $t \to \infty$ and uniform in the space variables, and oscillating asymptotic expansions of solutions in a small parameter $1/t$ for a different number of space variables. To do this she constructed fundamental matrices of solutions with locally integrable singularities. For each rotating liquid she first established an interesting fact: the degree of decrease of the solution as $t \to \infty$ is the sum of the degree of decrease of the solution in the case of each liquid without rotation and the degree of decrease of the solution disregarding the viscosity, but taking into account the rotation. Maslennikova and her students proved that the rate of stabilization (to a stationary solution) in the Cauchy problem and in initial boundary-value problems and the rate of exit to the limit amplitude in the case of periodic external forces are equal to the rate of decrease of the solutions in the absence of

sources. They determined uniqueness classes for limit amplitudes. With her Indian student Pal Pradip she made a complete study of the spectra of operators generated by boundary-value problems for linearized systems of hydrodynamics of a rotating ideal liquid taking into account the compressibility (hyperbolic system) and taking into account the compressibility and the viscosity.

Maslennikova has constructed a general theory of the Cauchy problem and initial boundary-value problems in Sobolev anisotropic spaces for different systems of hydrodynamics of a rotating liquid with variable coefficients, including degenerate systems in which the third equation of motion does not contain a complete time derivative. The studies of the hydrodynamics of a rotating liquid make up the longest series of papers by Maslennikova. The first part of this series of papers formed her thesis for the degree of Doctor of Science in 1971, and for the whole series on "Mathematical research on the qualitative theory of a rotating liquid" she and a group of scholars headed by Sobolev were awarded the State Prize of the USSR in 1986.

Her next series of papers, written with her pupil Bogovskii, is on the construction of the L_p - theory of the approximation of solenoidal and potential vector fields. It is a question of the approximation of solenoidal and potential vector fields from Sobolev spaces by smooth solenoidal and potential vector fields with compact and bounded supports, respectively. These results are applied to the solution of boundary-value and initial boundary-value problems for elliptic equations, and for Stokes and Navier-Stokes systems in unbounded domains with both smooth and non-smooth boundaries.

Maslennikova is an excellent lecturer and teacher. She devotes a lot of time and energy to training young scientists. Working at the Mathematical Institute of the Academy of Sciences of the USSR she supervises diploma and research students. The diversity in the content of the course work, diploma work, and theses of numerous students, and her habit of considering most carefully the inclinations and tastes of each student are characteristic of her broad scientific interests. Her pupils are to be found both at home and abroad — in the countries of Asia, Africa, and Latin America.

Maslennikova has attended Soviet and international congresses and conferences. In 1964 she began to play an active part in Soviet-Czechoslovak collaboration, and became a member of the organizing committee of the Soviet-Czechoslovak conferences on the theme "Methods of functional analysis and of the theory of functions in problems of mathematical physics." She is a member of the editorial board of the Siberian Mathematical Journal. She is a sympathetic and kindly person, always ready to help at difficult moments. We wish her many years of good health and further success in her research and teaching.

CHANGING AMERICA: THE NEW FACE OF SCIENCE AND ENGINEERING

selected sections from the Interim Report of The Task Force on Women, Minorities, and the Handicapped in Science and Technology, September 1988

Preface

The Task Force on Women, Minorities and the Handicapped in Science and Technology:

Established by the U.S. Congress in Public Law 99-383, Section 8, to report to the President, the head of each participating Federal agency, and the Congress;

Members are from 15 Federal agencies and leaders in the private sector and education;

Purpose is to develop a long-range plan for broadening participation in science and engineering;

Public hearings held in Albuquerque, Atlanta, Baltimore, Boston, Chicago, Kansas City, and Los Angeles between Fall 1987 and Spring 1988;

An interim report with recommendations is now being issued to emphasize that action rather than more study is needed;

Task Force report due again in December 1989 on progress being made toward implementation of the recommended plan;

The Task Force terminates on January 31, 1990.

Cochairs of the Task Force are: Dr. W. Ann Reynolds, Chancellor of the California State University System; Mr. Jaime Oaxaca, Corporate Vice President of Northrop Corporation.

Executive Summary

Our advanced industrial Nation — the America we have taken for granted for more than a generation — is changing. Our society is changing: more people are old, fewer are young, more come from minority groups. Our industry is changing: we are not the world economic leader we were for so long, but a competitor with other industrial nations. Our education system is changing: although our colleges and universities are the envy of the world, they are becoming more and more dependent on foreign students and faculty; our pre-college education system has reached a crisis state in which U.S. students are no longer competitive with those in other industrialized countries. Our present scientific and engineering workforce — the foundation for U.S. technological, economic, and military leadership — is eroding due to retirements and declining student interest.

As a result, the Task Force now reports to the President, the Congress, and the American people that one of our most urgent tasks is to strengthen our science and engineering workforce. The educational pipeline — from prekindergarten through the Ph.D. — is failing to produce the workers needed to meet future demand. Indeed, unless parents, schools, colleges, professional societies, industry, State legislatures, Federal agencies, the President, and Congress act in concert, our national science and engineering workforce will continue to erode and the prospects for maintaining an advanced industrial society will diminish.

In the year 2000, 85 percent of new entrants to the Nation's workforce will be members of minority groups and women. Meanwhile the number of people with disabilities who can go out into the workplace will rise. These three groups have historically been underrepresented in science and engineering. The Nation can meet future potential shortfalls of scientists and engineers only by reaching out and bringing members of these underrepresented groups into science and engineering. America's standing and competitiveness depend on it.

Findings of the Task Force

The Nation's leadership in science and engineering cannot be maintained unless the education pipeline from prekindergarten through graduate school is repaired so it can yield a larger and more diverse group of world-class scientists and engineers at all levels.

The factors — racism, sexism, and prejudice against people with disabilities — that have limited opportunities for many in America are also narrowing access to science and engineering careers.

Until now, the role of minorities, women, and people with disabilities in science and engineering has been widely seen only as an equity issue, rather than as the key to future national strength in science and technology.

Universities are not enrolling and graduating enough American students in science and engineering, especially those from underrepresented groups, to ensure our ability to meet demands for American scientists and engineers. Universities do not complement large enrollments of foreign graduate students with large enough numbers of Americans.

Federal agencies have not recognized or begun to address the demographic changes that are eroding the science and engineering workforce and which will affect the conduct of the Nation's research and development efforts in the 21st century.

Federal agencies have not been sufficiently interested in the issue to identify the impact of the $60 billion Federal research and development budget on underrepresentation in the Nation's scientific workforce. Programs for underrepresented groups were designed with equity as the goal, not with the goal of strengthening the Nation's science and engineering workforce.

Effective local intervention programs are demonstrating that young people from underrepresented groups can become quality scientists and engineers. However, such programs are too isolated and underfunded to meet national demand.

The entertainment industry — television, radio, movies, music — has an enormous impact on the minds and imaginations of youth. Some entertainment stimulates interest in and awareness of mathematics and science, but much entertainment sends negative images. Efforts to improve national mathematics and science achievement will not be successful unless the entertainment industry assists in bringing more young people through the education pipeline.

Industry has been active in the effort to raise high school graduation requirements and to support minority college students, particularly in engineering. However, long term, sustained, and systemwide activities are now in order.

Goals for the Nation

Goal #1: *Changing America:* The Nation should adopt the goal that all children born today, from all backgrounds, have a quality education, including mathematics and science education and the opportunity to participate in the science and engineering workforce to their fullest potential.

Goal #2: *PreK-12 Education:* The Nation should reform the preK-12 education pipeline so that our children's mathematics and science competence is better than that of students in countries with which we compete.

Goal #3: *Higher Education:* The Nation should increase the number and diversity of American students graduating in science and engineering. By the year 2000, we should produce enough professionals in these fields, including more from underrepresented groups, to meet the demand for faculty and for industry and Federal personnel.

Goal #4: *Federal Research and Development:* Federal research and development funds influence the Nation's entire science and engineering effort. They generate new knowledge, and employ and train scientists and engineers. These funds should be leveraged to help develop a more diverse, world-class generation of scientific and engineering workers by the year 2000.

Goal #5: *Federal Employment:* The Federal Government should continue to be a pacesetter in developing a work environment that is accessible, equitable, and favorable in attracting and advancing groups underrepresented in science and engineering.

Goal #6: *Influence of Culture:* Our Nation's future hinges on having an ample supply of people who achieve in mathematics and science, are science-literate, and perform technical jobs with world-class competence. The entertainment industry and the mass media — powerful influences in shaping society's values — must participate in reshaping popular attitudes toward science and engineering.

Highlights of Recommended Actions

Create a National Action Council on the Science and Engineering Workforce comprised of our country's highest leaders and charged to ensure that all sectors work actively to broaden participation in the Nation's science and engineering workforce.

School boards should ensure that teachers, principals, and counselors create a school and classroom climate of high expectations in mathematics and science for all students, particularly those from underrepresented groups.

Federal funds should be provided for improvement in mathematics and science educational achievement to school districts with significant enrollment of minority students.

University presidents should lead in creating a climate of action and accountability that accelerates the participation of underrepresented groups in all aspects of their institutions.

Universities should set quantitative goals for recruiting, retaining, and graduating more U.S. students in the sciences and engineering, especially from underrepresented groups. Science and engineering departments should set similar goals and take responsibility for ensuring that more students from these groups attain doctorates and obtain faculty positions. Forgivable educational loans could be provided to students from these groups who agree to pursue faculty careers.

The Federal government should initiate a National Research Scholars Program in Science and Engineering to increase the number and diversity of students earning the bachelor's degree in science and engineering; and establish a National Graduate Student Research Opportunities program offering fellowships and research assistantships in science and engineering to members of minority groups, women, and students with disabilities. These should be linked to the National Research Scholars Program to ensure continuity of support for these students.

States should establish a Scholar Incentive Program so that the top high school graduates in underrepresented groups can major in science and engineering at any public education institution in their State.

States should link articulation between 2-year and 4-year institutions so that 2-year college students would be encouraged to obtain the bachelor's degree in science and engineering.

Federal agencies should assess the impact of their entire research and development budget on the development of the Nation's science and engineering workforce. Within one year each agency should also develop plans for significantly diversifying the science and engineering workforce.

Federal agencies should include more women, minority group members, and persons with disabilities on their science- and engineering- related advisory committees.

Federal agencies that employ scientists and engineers should continue to recruit, train and advance more from underrepresented groups.

Industry should continue to sound the alarm about how weak educational preparation of our youth contributes to the declining economic competitiveness of the United States, and support the national goal to raise the quality of mathematics, science, and computer instruction and student achievement, particularly for underrepresented minorities, women, and individuals with disabilities.

Industry should provide summer work and research opportunities to high school students from underrepresented groups and their teachers so they obtain hands-on experience and see practical application of the technical theories taught in the classroom.

Industry should join and support alliances with Federal agencies and minority and majority universities aimed at increasing the number of graduates and researchers who are minority group members, women, or people with disabilities.

A task force of representatives from the entertainment industry should be established to report in the next 18 months on how its industry, along with the mass media, can spark the imagination and values of all Americans to reach the six national goals set forth in this report.

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III. Higher Education

Our colleges and universities train our Nations' science and engineering workforce and perform cutting-edge research. They have a key role in producing an adequate supply of science and engineering degree-holders to meet demand, and in giving all groups in society access to the skills and knowledge that make America great. Fulfilling these responsibilities is especially important in a period of large-scale demographic change.

Although the number of women, Blacks, Hispanics, and American Indians in science and engineering increased through the early 1980s, the absolute numbers were small, and they are now declining. In addition, since 1983, fewer freshmen overall have been planning to major in science and engineering, so the percentage of science and engineering degrees awarded will continue to drop.

The declining enrollment of U.S. graduate students is masked by recent high enrollments of foreign students in these fields, especially engineering. Today, 75 percent of the graduate students receiving financial support from university engineering departments are foreign nationals. The large presence of foreign nationals in these departments affects who are put on research teams, who receive fellowships and research assistantships, and who are eligible to become faculty members. The cultural attitudes of foreign students, particularly if they are instructors, may even discourage some Americans, such as women, from taking science and engineering courses.

Graduate departments in the United States not only train relatively fewer Americans, but they train even fewer graduate scientists and engineers who are Black, Hispanic, American Indian, or female. In 1986, 3,376 Ph.D.s were awarded in engineering by U.S. universities. Of this number, 1,661 went to U.S. citizens including 139 to women, 25 to Hispanics, 14 to Blacks, and 6 to American Indians.

Although women enter graduate school at about the same rate as men, they are considerably less likely than men to reach the Ph.D. They tend to be self-supporting rather than supported by the graduate departments. They cluster in the biological and health sciences.

These trends among the traditionally underrepresented groups need not continue; they can be reversed. On campuses where change has occurred, the presidents, deans, and department heads have provided strong leadership.

At the traditionally male Massachusetts Institute of Technology, for example, women have made up 38 percent of all freshmen for the past 3 years. As a result of institutional leadership, 100 of its 950 faculty are women. To encourage women to pursue research careers, MIT offers fellowships and other programs that carry high prestige and have helped many young women pursue academic research careers.

But colleges and universities cannot reach out to all groups, particularly the rapidly growing Black and Hispanic student pool, without first having faculty who themselves are from

underrepresented groups. Graduate departments are cultures in themselves. These cultures must be changed to reflect and attract the traditionally underrepresented.

Goal #3: The Nation should increase the number and diversity of students graduating in science and engineering. By the year 2000 we should produce enough professionals, including more from underrepresented groups, to meet the demand for faculty and industry and Federal personnel.

Action: Universities and colleges should:

Through their presidents, lead in creating a climate of action and accountability that accelerates the participation of underrepresented groups in all aspects of their institutions.

Set quantitative goals for recruiting, retaining, and graduating more U.S. students in the sciences and engineering, especially from underrepresented groups. Departments should set similar goals and take responsibility for assuring that more students from these groups attain doctorates and obtain faculty positions. Forgivable educational loans could be provided to students from these groups who agree to pursue faculty careers.

Provide child care for families of students and faculty, particularly because extended hours in laboratory research are crucial to professional success in science and engineering.

Forge effective partnerships between institutions which have significant enrollments from underrepresented groups and departments of science and engineering at research universities so students have access to advanced coursework and equipment.

Establish transfer centers with qualified counselors in 2-year colleges and vocational-technical schools to ensure the maximum flow of talent from these to 4-year institutions.

Action: The States should:

Develop quantitative plans for public higher educational institutions to recruit, retain, and graduate more students in science and engineering, especially those from underrepresented groups.

Offer scholarships in science and engineering to be honored at a public institution in that State to the top high school graduates, especially those from underrepresented groups.

Link articulation between 2-year and 4-year institutions so that 2-year college students would be encouraged to obtain the bachelor's degree in science and engineering.

Action: The Federal Government should:

Establish a National Research Scholars Program in Science and Engineering. The program should enable qualified high school students to have early research experiences and to earn the bachelor's degree in a science or engineering field. It should be tailored to attract minority and women students and students with disabilities, and aim to transform the size and makeup of the science and engineering workforce for a generation.

Provide stable and substantial support for effective intervention programs that graduate quality scientists and engineers who are members of underrepresented groups.

Establish a National Graduate Student Research Opportunities Program, targeted at minority and women students and students with disabilities, which provides fellowships and research assistantships for pursuing advanced degrees in science and engineering. This should be linked to the National Research Scholars Program to ensure continued support of these students to completion of the Ph.D.

Action: Industry should:

Through their industrial foundations, provide college scholarships and fellowships to members of the underrepresented groups who are motivated to major in science and engineering and to teach those subjects at precollege and college levels.

Join and support alliances with Federal agencies and minority and majority universities aimed at increasing the number of graduates and researchers who are minority group members, women, or people with disabilities.

Women

Composition.

Women are now 51 percent of the population and 45 percent of the Nation's workforce, yet they comprise only 11 percent of all employed scientists and engineers. In 1986 women earned 30 percent of all bachelor's degrees in science and engineering, 34 percent of the Ph.D.s in the life sciences, but only 16 percent of the Ph.D.s in physical sciences and 7 percent in engineering.

Background.

Despite continued career gains, women have not been choosing careers in science and engineering in the same proportions as in the nonscientific professional, business, and management areas. Women who do enter the science and engineering workforce tend to be paid less and promoted less often than white men. In 1985, women were only 13 percent of all college and university science faculty and 2 percent of engineering faculty. They were more than twice as likely as men to be in nontenure-track positions.

Women scientists and engineers also face two special problems. Even when women score higher academically than men, because of their work situation they are more likely to lose self-confidence and feel less satisfied. During their 20s and 30s — just when their career demands the most time — women need to make decisions about childbearing. One institutional response to this dilemma is Stanford University's 24-hour daycare program for faculty, staff, and students.

The pipeline.

In graduate school, a far smaller portion of women than men complete the Ph.D. This may be because women are more likely than men to be self-supporting during this period. They are also more likely to be assigned teaching assistantships, where they deal with students, rather than research assistantships, where they work with mentors and peers.

Model programs.

Thus far few intervention programs have addressed the unique needs of women, particularly in the employment area. Some intervention programs in the education arena are meeting with success.

Purdue's Engineering School's support program for women has helped raise the proportion of female engineering students from 2 percent to 21 percent. Purdue is one of the few schools that retains women engineering students at the same rate as men.

Smith College conducts summer workshops for teams of teachers and counselors to help them become proactive in advising young women to enter science fields.

The Math/Science Network, started at Mills College and expanded throughout the Nation, encourages young women to take a full complement of mathematics courses and exposes them to science and engineering careers. About 70,000 students participate annually.

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Conclusion: We Can Change America

The problem we face in the science and engineering professions stems from powerful underlying forces in American society, including discrimination, poverty, and deficits in education.

Poverty continues to grip a large number of children, including a disproportionate share of minority children. The Nation's public schools have traditionally provided a common pathway to the American dream of economic opportunity, but today the schools are hard pressed to serve the needs of children-at-risk. Most elementary and secondary schools do an inadequate job of preparing students in mathematics and science. Colleges and universities recruit too few science and engineering students, particularly students from underrepresented groups and do not retain enough through completion of the bachelor's degree. Graduate departments are not widening their pool of Ph.D.s with enough American students, especially those from underrepresented groups. The problem is continued by employers who have not yet opened career paths widely and visibly enough to prospective talent. It is further exacerbated by the mass culture.

Each sector of the Nation's science and engineering workforce, accustomed to operating independently, must now work with all the others towards a set of common goals.

The Task Force has outlined six goals and associated actions to change America. We are confident that change can occur.

We urge the Nation to share our goals of an America in which all citizens receive a quality education, have access to economic opportunity, and are the informed voters that a free society demands.

DEADLINES: Mar. 24 for May-June, May 24 for July-Aug., July 24 for Sept.-Oct.
AD DEADLINES: Apr. 5 for May-June, June 5 for July-Aug., Aug. 5 for Sept.-Oct.
ADDRESSES: Send all Newsletter material **except ads and book review material** to Anne Leggett,
               Dept. of Math. Sci., Loyola Univ., 6525 N. Sheridan Rd., Chicago, IL 60626;
               email: cantor!borel!alm@gargoyle.uchicago.edu (or .bitnet) (preferred); LMA24@LUCCPUA (bitnet)
               Send all material regarding **book reviews** to Martha Smith, Dept. of Math.,
               University of Texas, Austin, TX 78712.
               Send everything else, **including ads**, to Tricia Cross, AWM, Box 178, Wellesley College,
               Wellesley, MA   02181.

JOB ADS

Institutional members of AWM receive two free ads per year. All other ads
are $20.00 (as of January 1, 1989) and must be prepaid. The vacancies listed
below are in alphabetical order. ALL INSTITUTIONS ADVERTISING IN THE AWM
NEWSLETTER ARE AFFIRMATIVE ACTION/EQUAL OPPORTUNITY EMPLOYERS.

AUGSBURG COLLEGE. Are you dedicated to quality mathematics teaching in a
private, liberal arts college near the heart of Minneapolis? We are.
Continuing non-tenure track position begins 9/89. Ideal candidate would be
an excellent, creative teacher holding a doctorate, with general math
interests. Some teaching assignments in Weekend College likely. Apps from
high quality teachers with master's degrees also encouraged. Send letter of
intent, vita, 3 letters of recommendation, and evidence of creative,
innovative teaching to Kenneth Kaminsky, Chair, Dept. of Mathematics & Comp
Sci, Augsburg College, Minneapolis, MN 55454. Apps accepted until position
filled. Augsburg College is a college of the Evangelical Lutheran Church of
America.

BOARD ON MATHEMATICAL SCIENCES. Senior Program Officer. The BMS is preparing
a project to update the 1984 David Report, " Reviewing U.S. Mathematics:
Critical Resource for the Future," for NSF. The update will analyze the
current state of support for research in the math sciences and assess
progress against recommendations of the original David Report. It will go
further to identify promising opportunities for interdisciplinary research.
Incumbent will be responsible for organizing and supporting the work of the
committee, chaired by Edward E. David, Jr. Requires exc. organizational,
writing, and interpersonal skills and familiarity with math sciences research
and issues. A Ph.D. or equiv. experience in a math science is required.
Closing date: 3/15/89 but apps will be accepted until position is filled.
Submit resume or C.V. with salary history and names of 3 references to:
National Research Council, Board on Math Sciences NAS 312 (LC), 2101
Constitution Ave., N.W., Washington, DC 20418.

BOWDOIN COLLEGE. Two visiting positions, Math Dept., rank open, starting
Sept., 1989. 2 yr terminal positions. Ph.D. expected. Normal teaching
load, 6hrs./wk. Candidates with effective undergrad teaching pref. Send
resume with 3 letters of recommendation to Wells Johnson, Dept. of
Mathematics, Bowdoin College, Brunswick, ME 04011. App review begins 4/1/89
but new apps accepted until position filled.

THE COLORADO COLLEGE. Dept. of Mathematics, Colorado Springs, CO 80903.
Apps invited for a temp position as Instructor or Asst. Prof. to begin
8/30/89. There is some flexibility, however, so we encourage people
interested in a visiting position to apply. College seeks greater diversity
among its faculty. The dept. has an equal commitment to excellence in
teaching undergrad math and to math research. Candidates should send a
letter of application describing both your commitment to teaching and your
math interests, a C.V., a complete set of transcripts, and arrange to have 3
letters of recommendation (at least one must address teaching) to: John J.
Watkins, Chair, at the above address.

FAIRFIELD UNIVERSITY. The Department invites applications for a tenure track
position at Asst. Prof level beginning 9/89. Normal teaching load is 3
courses per semester with some research expected. A Ph.D. in Mathematics is
req. with teaching competence in Numerical Analysis or Statistics desirable.
Fairfield is a Jesuit University located on the Conn. coast 60 minutes from
NYC. For full consideration, send C.V. and 3 letters of reference to Joseph
B. Dennin, Chair, Dept. of Mathematics & Comp Sci, Fairfield University,
Fairfield, CT 06430-7524.

FROSTBURG STATE COLLEGE. Dept. of Math. 1 Tenure track instruc/asst prof
position; 1 Contractual-possible renewal as tenure track instructor position;
2 Contractual-renewable instructor positions--contractual (without benefits)
positions with possibility of renewal as contractual positions but not as
tenure track (benefits) positions. Each of these positions will teach 12
hours of undergrad math per semester and share in dept. responsibilities.
Master's degree in Math and undergrad teaching experience required.
Doctorate in mathematics or Math education preferred. Undergrad teaching
experience and quality of teaching of prime concern when reviewing
candidates. All positions effective Fall Semester 1989, full-time and are
subject to final funding approval by the Legislature of the State of
Maryland. Salaries competitive and will be influenced by degree status,
work, and teaching experience. Please specify positions for which applying.
Send letter of interest, resume, and names, addresses, and telephone numers
of at least three professional references, for contact, not later than March
31, 1989 to: Mr. C. Douglas Schmidt, Dir. of Personnel Services, Frostburg
State University, Frostburg, MD 21532.

HAMILTON COLLEGE. Dept. of Mathematics & Comp Sci, Clinton, NY 13323.
Temporary leave replacement position; 1 or 2 positions open. Rank open and
specialty open, but Ph.D. and prior teaching exp desirable. Excellence in
teaching req. Duties involve teaching 6 courses per year at a small, highly
selective, 4-year liberal arts college; a part time arrangement may be
possible. Send C.V. and 3 letters of reference (at least one about
teaching) to: Larry Knop, Chair.

HUNTER COLLEGE. Dept. anticipates seeking, for 9/89, a senior person for a
tenure track professorship with exceptional credentials in research,
teaching, and grantsmanship with the interest and proven ability to play a
major role in the development on the Dept.'s Mathematics Learning Center.
The MLC is a math lab primarily servicing students deficient in basic skills.
thanks to a substantial grant, it is in the process of being equipped with an
array of state-of-the-art computer equipment. It is hoped to ultimately
service a very broad spectrum of math and stat students as well.) Applicants
should send a vitae and letters of recommendation to Prof. J. Roitberg,
Chair, Dept. of Mathematical Sciences, Hunter College, New York, NY 10021.

OHIO WESLEYAN. Mathematics. Tenure track Asst. Prof beginning fall, 1989.
Opening subject to funding. Ph.D. in math with an interest in computing
science. Teach mostly undergrad math with some computer science. Usual load

3 courses per semester. Computing **facilities:** 2 VAX 11/730's and VAX 11/750 networked to Ethernet, one IBM 4341 **and** microcomputer lab. Apps close: 3/31/89. Send cover letter, resume, official grad transcript, and 3 letters of reference to: Professor David Hull, Chair, Dept. of Mathematical Science, Ohio Wesleyan University, Delaware, OH 43015.

OHIO WESLEYAN. Computer Science/Mathematics. Tenure track position beginning fall, 1989. Teaching load usually 3 courses per semester, 2 in computer science. Ph.D. in computer science with grad work in math desired. May consider Ph.D. in math with masters in CS. Seek person interested in curric. development. Scholarly activity expected. Computing facilities: 2 VAX 11/730's and VAX 11/750 networked to Bitnet, one IBM 4341 and microcomputer lab. Apps close: 3/31/89. Send cover letter, resume, official grad transcript, and 3 letters of reference to: Professor David Hull, Chair, Dept. of Mathematical Science, Ohio Wesleyan University, Delaware, OH 43015.

RENSSELEAR POLYTECHNIC INSTITUTE. Seek extremely high quality candidates for several tenure track openings at all levels in areas of app math, inc. math programming, starting 9/89 or earlier. Ph.D. and very strong research potential required for junior level appts. amd demonstrated outstanding record for senior level appts. Also anticipate one or two visiting and postdoc appts. Dept. of Mathematical Sciences, RPI, Troy, NY 12180. J. Ecker, Chair.

COLLEGE OF ST. CATHERINE. Tenure track position starting Fall 1989. Ph.D. in math, all areas considered. Excellence in undergrad teaching essential; scholarly activity encouraged. Teaching load: 6 courses per year. Rank and salary dependent upon qualifications and exp. Send resume and transcripts and have 3 letters of reference sent to: Sister Adele M. Rothan, Chair, Dept. of Math Sciences, College of St. Catherine, St. Paul, MN 55105. Consideration of apps begins 2/15/89.

ST. XAVIER COLLEGE. Computer Science, faculty position, tenure track, beginning 9/1/89. Will teach wide range of computer science courses, direct senior projects, and contribute to curriculum revision. Master's degree in CS, or equiv. computer exp with a Doctorate in Mathematics or Math Ed req. Rank and tenure commensurate with qual. Send letter of app, resume, and 3 letters of recommendation by 3/15/89 to: Dr. Susan Beal, Chair, Dept. of Mathematics & Computer Science, St. Xavier College, 3700 W 103rd St., Chicago, IL 60655.

SANTA CLARA UNIVERSITY. Dept. of Mathematics, Santa Clara, CA 95053. G. L. Alexanderson, Chair. One tenure track opening in math., Asst/Assoc. Prof. level, beginning 9/89. Ph.D. req; area of specialization open. Dept. emphasizes excellent teaching and continuing research commitment from faculty. Undergrad teaching only: 7 courses per year on quarter calendar.

TRENTON STATE COLLEGE. Asst. Prof of Math. Tenure track. Req'd: Ph.D. (or within one year of completion); demonstrated commitment to quality teaching; ability to teach applied math courses; strong research potential. Asst. Prof of Stat. Tenure track. Req'd: Ph.D. in Statistics; demonstrated commitment to quality teaching and strong research potential. Pref: ability to provide leadership to a developing program. Send vita and 3 letters of rec to: Dr. A. Papantonopoulou, Chair, Search Committee, Dept of Math & Stat, Trenton State College, Hillwood Lakes, CN 4700, Trenton, NJ 08650-4700. Deadline: March 1, 1989 or until positions are filled. Non U.S. citizens must inc statement of current visa status.

UNIVERSITY OF ALABAMA. Dept. of Mathematics invites apps for a tenure track, assoc. prof. position in applied mathematics, beginning 8/16/89. Candidates

must have a demonstrated research record that is compatible with the interests of the current faculty. These are continuum mechanics, optimization, computational math, and stochastic modeling. Send C.V. and names of 3 references to Dr. A.M.J. Davis, Box 870350, U. of Alabama, Tuscaloosa, AL 35487-0350.

UNIVERSITY OF ALABAMA. The department anticipates filling a senior level position (Full Professor, or possibly senior Assoc. Prof), to begin 8/16/89. Apps are invited from mathematicians whose credentials demonstrate excellence in both teaching and research and an ability to provide programmatic leadership. Areas of special interest are: algebra, analysis, continuum mechanics, computational math, diff equations, diff geometry, optimization, stochastic modeling, and topology. In the event that a permanent appt is not made, we also invite apps from visitors. Send a C.V., a sample of recent reprints and/or preprints, and the names of at least 3 references to: Professor Alan Hopenwasser, Dept. of Mathematics, The University of Alabama, Box 870350, Tuscaloosa, AL 35487-0350.

UNIVERSITY OF AUCKLAND. New Zealand. Apps should have a Ph.D. in Math., Physics, CS, or some related discipline in the Mathematical Sciences. Should have research interests in App Math, Scientific Comp., Numerical Analysis, Theoretical Physics, or some other field of application of mathematics. Duties inc: teaching grad and undergrad students. Research in chosen field required. Commencing salary range: $NZ35,000-$NZ42,500 per annum. Conditions of Employment and Methods of Application are available from the Asst. Registrar, Academic Appts., University of Auckland, Private Bag, Auckland, New Zealand. Apps should be sent as soon as possible but not later than 4/28/89.

UNIVERSITY OF CALIFORNIA AT BERKELEY. Dept. of Mathematics, UC at Berkeley, Berkeley, CA 94720. Several temp positions beginning in Fall, 1989 are anticipated for new and recent Ph.D. 's of any age, in the areas of algebra, analysis, applied math, foundations of geometry and topology. The terms of these appts. may range from 1 to 3 years. Apps for NSF or other postdoc fellowships are encouraged to apply for these positions; combined teaching/research appts. whose research interests are close to those of regular dept. members will be given some preference. Send by 4/1/89 a resume, and reprints, preprints and/or dissertation abstract. Ask 3 people to send letters of recommendation to: Marc A. Rieffel, Vice Chair for Faculty Affairs, at the above address. (Apps received for our earlier deadline 1/15/89, will automatically be considered for this deadline also.)

UNIVERSITY OF CONNECTICUT. The Mathematics Dept. invites applications for a full-time position at the Asst. Prof. level at the University's Torrington branch, which is part of the Litchfield County Center for Higher Education. The Center's unique nature provides opportunities for a broad range of teaching, research, and service. A Ph.D. in mathematics, some demonstrated talent in teaching undergrads and evidence of ability to contribute to the research mission of the department is required. (Candidates anticipating completion of the Ph.D. prior to 9/89 will be considered.) Salary will be competitive, commensurate with qualifications. Screening will continue until position is filled. Send C.V. and have at least 3 letters of reference sent to: Professor James F. Hurley, Associate Head, Dept. of Mathematics, U-9, 196 Auditorium Rd., Storrs, CT 06269-3009.

UNIVERSITY OF IOWA. The Dept. of Mathematics invites apps for at least one tenure track position, beginning Aug., 1989. All levels of candidates whose presence would complement or strengthen existing research groups or who specialize in harmonic or stochastic analysis. Apps should send vita and have three letters of recommendation sent to: William A. Kirk, Chair, Dept.

of Mathematics, U. of Iowa, Iowa City, Iowa 52242. By making this appt the Dept. hopes to attain diversity on the faculty.

UNIVERSITY OF LOUISVILLE. Three tenure track asst. professorships may be available pending funding for candidates with active research programs in areas compatible with the departments mission and interests. Starting date: Fall 1989. Ph.D. by August, 1989 is required. Some teaching exp is preferred. Candidates should send a letter of app with vitae, 3 letters of recommendation and an official transcript to: Dr. W. Wiley Williams, Dept. of Mathematics, University of Louisiville, Louisiville, KY 40292. Consideration will begin upon funding and continue until positions are filled.

UNIVERSITY OF MARYLAND BALTIMORE COUNTY CAMPUS. Apps invited for a Senior Statistician, assoc. or full prof rank. Apps with strong research records are encouraged to apply. Send C.V., list of publications, and a list of references to: James M. Greenberg, Chair, Dept. of Math. and Stat., U of Maryland Baltimore County Campus, Baltimore, MD 21228. Apps considered until position filled.

UNIVERSITY OF MICHIGAN - DEARBORN. Tenure track position at asst/assoc level available 9/89. Appt. in Dept. of Mathematics with primary responsibilities in Interdisciplinary Computer Science program (Business, Engr., Math). Ph.D. in one of the computer or information sciences with grad level work in one of the math sciences or a Ph.D. in one of the math sceinces and a master's degree or equiv in one of the computer or information sciences required. 9 hours teaching load per sem, release time for research available to junior faculty. Send vita, 3 letters of recommendation, official transcripts to: Chair Search Committee, Dept. of Math and Stat, U of Michigan - Dearborn, Dearborn, MI 48128-1491.

UNIVERSITY OF MICHIGAN - DEARBORN. Tenure track position starting 9/89. Asst Prof level, Ph.D. in Math required. Pref to research interest in applied math. Teaching capability in an applied area of math or stat also a plus. Teaching load: 9 hours per sem. Send resume to: James Brown, Co-Chair, Search Committee, Dept. of Math and Stat, U of Michigan -Dearborn, Dearborn, MI 48128.

UNIVERSITY OF NORTH CAROLINA at Chapel Hill. Apps invited for a senior level tenured appt in the general area of app and computational mathematics, effective Fall 1989. Rank and salary depend on qualifications. Ph.D. and demonstrated excellence in research and teaching required. Apps will be accepted until position filled. Contact Jon Tolle, Math Dept., Box 3250 Phillips Hall, UNC at Chapel Hill, Chapel Hill, NC 27599.

UNIVERSITY OF OKLAHOMA. Nominations and applications invited for the position of Chairperson in the Dept. of Mathematics effective Fall 1989. Candidates must possess an earned doctorate, a substantial record of research achievement, a commitment to excellence in teaching, and leadership and administrative abilities appropriate to a growing dept. that is dedicated to a balanced program of quality research and teaching. The Math dept. has over 30 faculty members, most of whom are actively involved in research, and offers programs for bachelor, master's, and Ph.D. degrees. There is extensive prog of scientific activity supplemented by substantial endowment for discretionary funds. Candidates should send cover letter, vita, selected reprints, and arrange to have 4 letters of reference (inc. at least one concerning administrative abilities) sent to: Dr. Kevin Grasse, Chair Search Committee, Dept. of Mathematics, 601 Elm Phsc 423, Norman, OK 73019. Phone: 405-325-2903.

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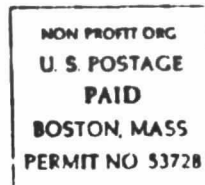
March-April 1989

Marie A. Vitulli
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