AWM
ASSOCIATION FOR WOMEN IN MATHEMATICS

Volume 34 Number 1 NEWSLETTER January–February 2004

PRESIDENT'S REPORT

Perhaps you've considered a gift AWM membership for a friend, but have you ever considered one for a detractor? Long-time AWM member Pat Kenschaft shared the following delightful story. Her (now-grown) daughter's middle school mathematics teacher was convinced that girls were not capable of doing mathematics. For example, he responded to a male student's request for help by declaring, "If you are not capable of doing a simple problem like that, then you belong on the girls' side of the room!" What was Pat to do? Confronting the teacher could have repercussions for her daughter. Instead, she anonymously bought him a membership in the AWM. As the year progressed, the teacher began quoting positive anecdotes about women in mathematics. By the end of the year, he was preaching the importance of mathematical education for girls!

The results of the recent AWM election will be announced in the next *Newsletter* and may already be available on the AWM website by the time you read this.

In my last column I mentioned that the AWM had contracted with a consultant, Nancy Moore, to help us with strategic planning. We thank all of you who aided in this process by filling out the survey circulated in November. The entire process will take approximately half a year. We will report on the results at the completion. We are very excited by this opportunity to move the AWM forward.

The question of **childcare** at the Joint Mathematics Meetings is springing up in many different areas of the mathematical community. I was excited to learn that the AMS and MAA have been extensively researching this complex issue. On behalf of the AWM, I would like to thank all of you that filled out the childcare survey, as the results will be helpful to the societies in assessing the level and pattern in which such services might be used. The AWM applauds and supports the efforts of the AMS and MAA.

IN THIS ISSUE

4 Book Review

5 Education Column

7 Non-Standard Careers

17 Applied Mathematics Research and Leadership Workshop

19 SKHS Mathematics Days

AWM
ASSOCIATION
FOR WOMEN IN
MATHEMATICS

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

The *Newsletter* is published bi-monthly.

The Editor welcomes articles, letters, and announcements.

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It is not too late to apply for the upcoming workshop **"After Tenure: Women Mathematicians Taking a Leadership Role"** to be held at the University of Maryland March 12–14. The target date for applications is January 20. However, if that date has passed, you are welcome to contact the AWM office to see if any openings remain. We emphasize that the workshop is geared to all women who are tenured (or nearly so) and have not yet reached the stage of leadership. Most participants will be women who were tenured within the past half dozen years, but there is considerable flexibility.

We will hold a second (and most likely final) round of selections for the **Michler Collaborative Research Grants** on February 10. These grants provide travel funds to work with a research collaborator. Travel must be completed by August 2004. These grants are available only to women who are already tenured. Untenured women are eligible instead for the ongoing program of Mentoring Grants.

Many of you have already begun forming **AWM Student Chapters** at your institutions. The beginning of the winter term may be an excellent time to bring the students together. You'll find information on starting a student chapter on our website. This is also the time to tell your students about REU's (Research Experience for Undergraduates) and other summer programs, as deadlines are coming soon.

The AWM has completed its move to new office space in the Cole Field House at the University of Maryland. However, please continue to use our old mailing address until notified in this *Newsletter* and on our website. Our telephone and fax numbers will stay the same. Fall is always a time of especially high activity in the AWM office. We thank our full-time staff members Dawn Wheeler and Muriel Daley for their tremendous effort in completing the move this past fall. We also thank the University of Maryland for continuing to provide a home for us.

We are delighted to welcome our new web editor Holly Gaff. In accordance with the changes made in 2001 to the AWM bylaws, the web editor will serve as a member of the AWM Executive Committee as of February 1 of this year.

We are very pleased to thank the National Security Agency for joining with the Office of Naval Research in providing funding for our program of workshops for women graduate students and recent Ph.D.'s. Over the past dozen years, several hundred women have presented their research and received advice and mentoring at the beginning of their mathematical careers. Many of these women have returned to the workshops as mentors and panelists themselves. Please note the upcoming target date of January 26 for applications for the workshop to be held at the SIAM Annual Meeting this summer.

As I am writing this column during Thanksgiving weekend, I would like to thank both the many volunteers who are the heart of the AWM and my friends and colleagues who have given me so much support during my first year as president. There are far too many to name, but I would like to give a personal thanks to Catherine Roberts for her friendship and encouragement, to Fern Hunt for her thoughtful and much appreciated advice and help, to Ginger Warfield who not only enriches the newsletters with her fascinating education and biography columns but also cheerfully takes on innumerable tasks, and to Anne Leggett, our Newsletter Editor, who is always there to help and who challenges me to consider different viewpoints.

Best wishes for the winter term.

Carolyn Gordon

Carolyn Gordon
Dartmouth College
November 29, 2003

MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues

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

Subscriptions and back orders

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

Payment

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

Newsletter ad information

AWM will accept advertisements for the *Newsletter* for positions available, programs in any of the mathematical sciences, professional activities and opportunities of interest to the AWM membership and other appropriate subjects. The Director of Marketing, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the* Newsletter *must be Affirmative Action/Equal Opportunity designated.* Institutional members receive discounts on ads; see the AWM website for details. For non-members, the rate is $100 for a basic four-line ad. Additional lines are $6 each. See the AWM website for *Newsletter* display ad rates.

Newsletter deadlines

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

Addresses

Send all **Newsletter** material **except ads and material for book review and education columns** to Anne Leggett, Math Dept., Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; email: leggett@math.luc.edu; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Math Dept., University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; email: bayer@math.ukans.edu; fax: 785-864-5255 and all **education column** material to Ginger Warfield, Math Department, University of Washington, Seattle, WA 98195; email: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to Dawn V. Wheeler, 4114 CSS Building, University of Maryland, College Park, MD 20742-2461; phone: 301-405-7892; email: awm@math.umd.edu.

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Online Ads Info

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

Website and Online Forums

http://www.awm-math.org

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AWM-Net

To subscribe, send mail to awm-net-request@ cs.umd.edu and include your email address; AWM members only.

AWM DEADLINES

Leadership Conference:
January 20, 2004 (target date; see page 14 for further info)

AWM Workshop, July 2004:
January 26, 2004

NSF-AWM Mentoring Travel Grant:
February 1, 2004

NSF-AWM Travel Grant: February 1 and May 1, 2004

Sonia Kovalevsky High School Mathematics Days: February 4, 2004

Michler Collaborative Research Grants:
February 10, 2004

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BOOK REVIEW

Athena Unbound. The Advancement of Women in Science and Technology, by Henry Etzkowitz, Carol Kemelgor, and Brian Uzzi, Cambridge University Press, Cambridge, UK, 2000, ISBN 0 521 78738 6, 282 pp.

Reviewer: Margaret Bayer, Book Review Editor, University of Kansas, Lawrence, KS 66045-7523, bayer@math.ukans.edu

What are the current status and condition of women in academic science? It is sometimes hard to see beyond our own desks and academic communities. No doubt there is much variation from discipline to discipline, from department to department, from university to university. This book is based on several studies, using interviews, focus groups, and a survey in five science and engineering disciplines (not including mathematics). In addition, the authors interviewed children at a Montessori school for their perceptions of "the scientist." The focus of the book is not on numerical measures of women's progress in academic science, but rather on climate issues. The result includes some surprising pictures, some questionable analyses, and some good points I had not considered. A young scientist might read the book to learn about certain career traps and have a better chance of avoiding them.

The rhetoric of the past 15 years focused on pumping the pipeline, creating a pool of women scientists and engineers to become the future faculty. The results of this strategy have been mixed and disappointing. There is a greater recognition of the complex factors that keep the numbers of women in science low. Women are still not welcome at some important centers of scientific research. Women, on the whole, have more difficulty with clashes between career choices and personal aspirations. The "two-body" problem affects women disproportionately, and a stigma may be attached when individual or institutional accommodations are made. Women experience the accumulation of disadvantage.

In comparing the experiences of women and men at the graduate student and postdoctoral career stages, the authors focus on the cultivation of informal supports and resources. They describe a culture in which "male professors draw many of their male graduate students into a supportive, caring environment," while "female graduate students are often left to be 'rugged individualists.' " Even when male students are not taken under some faculty member's wing, they can turn to their peers for information and encouragement. Social activities centered around sports or drinking draw the male students in and often leave the females out.

The research found that women students faced some degree of exclusion from study groups in virtually all the departments studied.

Women look ahead to academic hurdles such as qualifying exams with less confidence than men; some, convinced that they will not succeed, drop out without giving themselves the chance. Choosing an advisor and developing a relationship with the advisor are the source of great anxiety in many women. When women students have problems with exams or advisors, they are more likely to blame it on themselves and less likely to search for alternatives.

From my observations, much of the description of the difficulties women face rings true. However, the ease of the males' paths is exaggerated. There are men who are swept into the academic enterprise and develop relationships that help them develop to their potential. But let's face it, scientists generally have neither the time nor the skills to be the perfect mentor. Male students flounder, miss opportunities, fret over finding an advisor, and even drop out. To me it seems that the book is contrasting particularly well-connected and nurtured male students with women students who have somewhat less than average self-confidence and peer support. There is some evidence that men, due to greater self-confidence and sense of entitlement, need less external affirmation and support to persist. Thus men may report a higher amount of support from faculty and peers than women, even if objectively the levels of support do not differ much. Also, men are perhaps hesitant in interviews to voice their self-doubts and errors.

This is not to say that women and men have equal chances at negotiating the experiences of graduate school and postdoctoral positions. Women still face gender bias and harassment at times. Individual male scientists, faculty and students, sometimes feel threatened and strive to exclude talented women. This may take the form of attributing a woman's success to affirmative action, thereby belittling the woman's accomplishments. Departments bear responsibility for tolerating or even encouraging such behavior.

My hope is that if women are aware of the dangers of social isolation and the opportunities that could be available to them, they will develop better sources of support and information networks and will fight more effectively against discriminatory and exclusionary practices. The barriers described are usually not explicit, and the collective efforts of women can sometimes overcome them. I have always been fortunate to find support networks of women and fair-minded men, so that I could get around obstructions and hold onto my self-confidence. In some environments, unfortunately, one needs to travel quite far afield to find such support. Of course, it is an unfair waste of women's energies to build up these defenses.

Some of the climate issues discussed are less of a problem for mathematicians than for those in experimental science and engineering (the areas studied). For example, the authors talk about the isolation of women scientists when a small number of women are spread out over research labs with little inter-lab contact. In the typical mathematics department, faculty and graduate students are not so segregated by discipline. For graduate students, especially, the social network often grows out of the group of teaching assistants or the students taking the common introductory curriculum. Also, in science students generally feel pressure to spend late nights in the lab, sometimes because experiments must be tended round the clock, but sometimes just for the appearance of dedication. This, of course, poses special problems for women with families. In mathematics, late nights in the department may be considered a sign of diligence, and the working relationships established there may by valuable, but it is not as critical.

A research mathematician, tenured or on the tenure track, has two mathematical communities: her department and her research area. The climate for women in mathematics departments varies considerably. At the most prestigious departments the numbers, at least, are very bad. No department ranking in the top ten (by score in the National Research Council survey) has 10% women on the faculty; the figure may even be less than 5%. Numbers, of course, do not correlate precisely with climate, but the advantages of a critical mass are obvious. Some strong, but less prestigious, research departments welcome strong women mathematicians.

The group of colleagues in one's research area is, of course, harder to delineate than one's department. For the advancement of one's research, however, this is the group that counts. A mathematician frequently has no research colleague in her department. The variety of climates within research groups in mathematics is known only through anecdotes. There may be some migration of women from unfriendly to more friendly research groups. Whatever the climate of one's research group, it is up to the individual to cultivate the contacts and resources that will support one's research career. This is referred to as "social capital." The authors mention a Danish study that found that women had to have

2.6 times the number of publications of men to obtain postdoctoral fellowships. (Unfortunately, as in a number of similar instances, the authors do not provide a reference for this study.) The inference they draw is that "human capital," the quality of one's work, must make up for a dearth of social capital.

At one time it was almost impossible for a woman with children to do scientific research in a university. This has changed to a certain extent, though perhaps more in mathematics than in other fields of science. Certainly some women still feel they must choose between children and a career in scientific research. All women who choose to have children face difficult issues and demands. The childbearing years are also the time of greatest professional demands—the years of graduate school, postdoctoral positions, and the tenure track. Few women have the luxury I had, of waiting until after tenure to have children. The scientific community has become more understanding of the issue. Many male scientists now have wives with careers, scientific or otherwise. These men generally spend more time with their families and become allies in the efforts to increase flexibility in the academic system. But hopes for change are dampened by the increase in competition and demands in science and in academia. A wide range of institutions require for tenure and promotion more publications, more grants, a greater teaching portfolio, and more accounting.

At the beginning of the book there is brief mention of the research on which it is based, but many of the claims of the book are not backed up by any references to this research. Assertions and statistics, presumably from other people's research, are often reported with no citations. There is an extensive bibliography, but with few citations and no annotation, it is not so useful. Chapter 12 reports on data collected in the survey and includes a number of tables, but they are not explained sufficiently. The correspondence between the survey questions and the data in the first table is unclear. Another table summarizes survey respondents' age, years since Ph.D., years employed, and years in postdoctoral positions. The numbers seem wildly inconsistent, but no remark on it is made in the text. (The average untenured male was reported as 45 years old, 16 years past Ph.D., but with only six years of employment and three years as postdoc.) Furthermore, significance is claimed for differences between untenured women faculty in departments with a critical mass of women and those who are "tokens" in their departments, based on responses from seven women in critical mass and four in token situations.

In spite of these shortcomings, I recommend the book for senior scientists, who can effect change in their departments and labs, and for junior scientists, whose career paths might be eased by an appreciation of the kinds of support systems they need to develop.

HRUMC XI

The eleventh annual Hudson River Undergraduate Mathematics Conference will be held at Mt. Holyoke College in South Hadley, MA on April 3, 2004. The conference includes presentations on mathematics by both faculty and students, and both are encouraged to participate. Conference sessions are designed so that some presentations are accessible to undergraduates in their first years of study, and others are accessible to third or fourth year undergraduate mathematics majors.

The keynote speaker this year will be Dr. Nancy Kopell, co-director of the Center for BioDynamics at Boston University. She will be speaking on "Dynamical Systems of the Nervous System: Do Rhythms Help Us Think?"

You can find out more about HRUMC by visiting the conference website http://www.skidmore.edu/academics/mcs/hrumc.htm. Those wishing to make a presentation at the conference should submit an abstract via the website by **February 27, 2004**. We would like to thank Mt. Holyoke College and the MAA for their support of HRUMC XI.

DUES! DUES! DUES!

If you have not yet paid your dues, please take a moment to do so now. Encourage a colleague to join, or give a membership to someone, perhaps a student who could use some encouragement.

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

supported by the Department of Energy, the National Security Agency,
the Office of Naval Research, and the Association for Women in Mathematics

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

WHEN: An AWM WORKSHOP is scheduled to be held July 12–13, 2004 in conjunction with the Society for Industrial and Applied Mathematics (SIAM) 2004 Annual Meeting and the Life Sciences 2004 Conference at the Oregon Convention Center in Portland, Oregon, July 12–16, 2004.

FORMAT: The workshop will consist of a poster session by graduate students and two or three minisymposia featuring selected recent Ph.D.'s, plus an informational minisymposium directed at starting a career. The graduate student poster sessions will include all areas of research, but each research minisymposium will have a definite focus selected from the areas of Mathematical Biology, Modeling, Control, Optimization, Scientific Computing, and PDEs and Applications. AWM will offer funding for travel and two days subsistence for as many as twenty participants. Departments are urged to help graduate students and recent Ph.D.'s obtain supplementary institutional support to attend the workshop presentations and the associated meetings. All mathematicians (female and male) are invited to attend the program.

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

ELIGIBILITY: To be eligible for selection and funding, a graduate student must have begun work on her thesis problem, and a recent Ph.D. must have received her degree within approximately the last five years, whether or not she currently holds a postdoctoral or other academic or non-academic position. All non-US citizens must have a current US address. All applications should include a cover letter, a summary of research work (one or two pages), a title and abstract (75 words or less) of the proposed poster or talk, and a curriculum vitae. A supporting letter of recommendation from a faculty member or research mathematician who knows their research is required for graduate student applicants and recommended but not required for recent Ph.D.'s. Additional letters of support are encouraged. All selected and funded participants are invited and strongly encouraged to attend the full AWM two-day program. Those individuals selected will be notified by the AWM Office and will need to submit a final title and abstract with name, affiliation, address, etc. by mid-February to SIAM for the meeting program; AWM will provide instructions with the notification. For some advice on the application process from some of the conference organizers see the AWM website.

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

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

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

APPLICATION DEADLINE: Applications must be received by **January 26, 2004**.
Applications via email or fax will not be accepted.

EDUCATION COLUMN

This column rarely features guest writers. This time I am making up for that: I have a whole bunch of them, some anonymous, some pseudonymous, and all under the age of sixteen.

A word of explanation might be in order. A couple of weeks ago, at the recommendation of a colleague, I began reading Jo Boaler's *Experiencing School Mathematics*. I found it both exciting and informative. It is a report on a three-year longitudinal study of students at a pair of middle schools. The middle schools are English ones, but as Alan Schoenfeld points out in his introduction, they could just as well be anywhere in the US. The schools were carefully chosen to match closely in terms of student social and economic status and to diverge maximally in terms of pedagogic stance. At Amber Hill (a pseudonym, of course), conscientious and hard-working teachers adhere to a highly traditional format: students are in eight different tracks, but for each one the class proceeds the same way, with half a period to present a new topic or technique, and half a period for students to practice it. And practice it they do, sitting quietly in straight lines, heads down and pencils moving. At Phoenix Park, on the other hand, all classes are in mixed groupings, and all lessons are project based. Projects last for several days, and the level of freedom and apparent chaos is such that I suspect even my progressively-inclined mind would boggle. There's nothing chaotic at the teaching end, though: conscientious and hard-working teachers have spent a lot of time choosing the projects and working on their implementation.

At the end of three years, the students in the study all took a set of very formal tests administered throughout the English system. The Phoenix Park results were appreciably higher than the Amber Hill ones. This alone is impressive—but I was even more impressed by the degree to which the Phoenix Park students had developed autonomy, a sense of mathematical responsibility, and a capacity to take their mathematics out of school with them. I was hoping to convey that here with quotations taken from the book, mostly those spoken by students. Unfortunately, most of what is quoted of theirs comes in the midst of research interviews, which makes them somewhat cumbersome to use.

The project was just beginning to daunt me when another group of kids crossed my horizon. These were American students, and their story is a very different one, but one with some key and very heartening similarities. It seems that a few years ago Linda Foreman, an Oregon teacher, was in the process of developing a middle school curriculum entitled *Visual Mathematics* and needed a class to teach it to. She not only got one, she got to keep a number of the students through four years of school. The students developed into a tight and appreciative community, and in 1997, after reading a bit about TIMSS, they decided they would like to tell the National Council of Teachers of Mathematics and the National Council of Supervisors of Mathematics about what they had learned. Many a bake sale and writing session later they had their tickets in hand and their speeches in their suitcases. From those speeches, a booklet entitled "What's the Big Idea?" was made. I had the good fortune to be given a photocopy, and I treasure it. It feels as if these ninth and tenth graders articulated the entirety of the philosophy that underlies my own support of the various "progressive" styles of teaching. What I really want to do is reproduce the whole booklet, but lacking that option I'll do some extracting of passages that particularly strike me.

Before I turn the column over to the kids, though, I need to point out one more aspect of the overall situation that struck me. At Phoenix Park, the central teaching organizer was the sequence of projects that the teaching staff had developed and honed over a number of years. Students were permitted to confer, and certainly spent plenty of time in conversation, but were basically working individually. In Oregon, the center was the Visual Mathematics curriculum that the teacher was in the process of developing. Students were permitted to go off on their own, and certainly spent plenty of time in individual thought, but were basically working in groups. Despite this difference in approach between the two groups, the outcome in the areas that seem to me essential was identical. Students left with a firm grasp on some chunks of mathematics and an even firmer confidence that they could figure out whatever part of the rest

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

of mathematics they wanted to. There is no single Right Way to do that. And I might add, thank goodness there isn't!

Here are a few of the things that the kids wrote in "What's the Big Idea?" and that I loved reading:

> Every day there are continually more issues that I can find, explore, prove and wrestle with, that's what makes the subject of math so exciting to learn about.... Just when I think I understand one topic completely and can't know any more about it, we investigate another one that fits right in. Sometimes the new topic even raises ideas that contradict what I had previously been thinking and help me come to a better understanding.

> Learning is a journey. Mathematical trust keeps us going and allows us to travel in new directions without worrying about getting lost or taking the routes that others do.... Our teacher has "mathematical trust" in my classmates and me—that is, she believes there is a mathematician within each of us. Therefore, she does not lead, show, or guide us in our journey. Rather she provides an activity that encourages us to try new routes and discover landmarks.

Another student discusses these activities in more detail:

> In order to determine if an activity is worthwhile, some helpful things to ask are:
>
> - Will it make the students stretch their thinking?
> - Will it branch off to other topics?
> - Is there more than one way to solve the problem?
> - Will it help the students' understanding of the idea?
> - Will it cause some disequilibrium?

Other students also comment on disequilibrium:

> Some people think that a student shouldn't leave the classroom in disequilibrium. I think that if a student leaves the class with an idea that doesn't work it gives her a chance to rethink the problem and maybe get more ideas.... Disequilibrium is a healthy thing to have, as long as it's not out of control. *[I do like that last proviso!]*

NSF-AWM TRAVEL GRANTS FOR WOMEN

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

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

Eligibility. These travel funds are provided by the Division of Mathematical Sciences of NSF, and the research conference must be in an area supported by DMS. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.) Applicants must be women holding a doctorate (or equivalent experience) and having a work address in the US (or home address, in the case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving significant external governmental funding (more than $1000 yearly) for travel is ineligible. Partial travel support from the applicant's institution or from a non-governmental agency does not, however, make the applicant ineligible.

Target dates. There are three award periods per year. An applicant should send *five* copies of 1) a cover letter, including the conference name, conference dates and location (city/state/country), and amount of support requested, 2) a description of her current research and of how the proposed travel would benefit her research program, 3) her curriculum vitae, 4) a budget for the proposed travel, and 5) a list of all current and pending travel funding (governmental and non-governmental) and the amounts available for your proposed trip to: Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The next two deadlines for receipt of applications are **February 1** and **May 1, 2004**.

Another student, discussing the importance and excitement of inventing mathematical ideas, explains "For us, in an ideal class, the teacher gives the class a situation to investigate, and then turns the students loose."

One of his classmates, on the other hand, recognizes that the teacher's role does not stop with the presentation of the situation, but continues with the asking of questions—provided the questions are *effective* ones, which she characterizes as ones which "allow the student to explain his or her thinking process." She goes on to give examples of effective questions:

- What do you think?
- What if _____?
- Is there another way to think about that problem?
- What are some observations you can make?
- Can you explain your thinking?
- Can you predict what might happen next?

I'll finish with a pair of quotations that seem to me a particularly neat illustration of the similarity of the outcomes of the two teaching strategies. From Oregon: "To us, real mathematics is not a page filled with numbers and symbols, it is about applying everything you know to solve a puzzle." From Phoenix Park: "[Math is] more the thinking side to sort of look at everything you've got and think about how to solve it."

SONIA KOVALEVSKY HIGH SCHOOL MATHEMATICS DAYS

Through grants from Coppin State College and the National Security Agency (NSA), the Association for Women in Mathematics will support Sonia Kovalevsky High School Mathematics Days at colleges and universities throughout the country. Sonia Kovalevsky Days have been organized by AWM and institutions around the country since 1985, when AWM sponsored a symposium on Sonia Kovalevsky. They consist of a program of workshops, talks, and problem-solving competitions for high school women students and their teachers, both women and men. The purposes are to encourage young women to continue their study of mathematics, to assist them with the sometimes difficult transition between high school and college mathematics, to assist the teachers of women mathematics students, and to encourage colleges and universities to develop more extensive cooperation with high schools in their area.

An additional selection cycle will be held in February 2004 for Spring 2004 using funds remaining after the August 2003 selection cycle. AWM anticipates awarding up to six additional grants ranging on average from $1500 to $2200 each ($3000 maximum per school) to universities and colleges. Historically Black colleges and universities are particularly encouraged to apply. Programs targeted toward inner city or rural high schools are especially welcome. If selected, institutions will receive (upon request) an information packet consisting of model schedules of activities, a check list for the sorts of arrangements that need to be made, suggestions for securing additional funding and for obtaining prizes to be awarded to contest winners, recruitment and publicity material to be adapted for local use, lists of possible workshop topics for students and teachers, model problem solving contest material, and guidelines for follow-up activities and evaluation.

Applications, not to exceed five pages, should include: a) plans for activities, including specific speakers to the extent known; b) qualifications of the person(s) to be in charge; c) plans for recruitment, including the securing of diversity among participants; d) detailed itemized budget (i.e., food, room rental, advertising, copying, supplies, student giveaways, etc. Honoraria for speakers should be reasonable and should not, in total, exceed 20% of the overall budget. Stipends and personnel costs are not permitted for organizers. This grant does not permit reimbursement for indirect costs or fringe benefits. Please itemize direct costs in budget.); e) local resources in support of the project, if any; and f) tentative follow-up and evaluation plans.

The decision on funding will be made in late February for high school days to be held in Spring 2004. If selected, a report of the event along with receipts (originals or copies) for reimbursement must be submitted to AWM within 30 days of the event date or by June 1, 2004, whichever comes first. Reimbursements will be made in one disbursement; no funds can be disbursed prior to the event date.

Send *five* complete copies of the application materials to: Sonia Kovalevsky Days Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, Maryland 20742-2461. For further information: phone 301-405-7892, email awm@math.umd.edu, or visit www.awm-math.org. Applications must be received by **February 4, 2004**; applications via email or fax will not be accepted.

References

"What's the Big Idea?" assembled by Linda Cooper Foreman of the Math Learning Center at Portland State University

Experiencing School Mathematics, Traditional and Reform Approaches to Teaching and their Impact on Student Learning, Revised and Expanded Edition by Jo Boaler [Lawrence Erlbaum Press, 2002]

NON-STANDARD CAREERS

We continue our series of articles about women in mathematics whose careers have taken some unexpected twists and turns but have wound up satisfying. And we repeat our invitation: if you or someone you know has had such a career and would like to write about it, or to talk on the phone and have somebody else write about it, please get in touch with Ginger Warfield (warfield @math.washington.edu).

The subject of this issue's non-standard careers article is Charlotte Lin, a woman clearly blessed with a non-standard amount of energy. She was brought to my attention by her thesis advisor, Anil Nerode, whose recommendation was so enthusiastic that it clearly had to be followed up. The follow-up yielded the paragraphs below, which I think she expected me to formalize and standardize a bit, but they sparkle and crackle with such energy that I couldn't stand to tamper with them, so here they are:

Cornell Math Ph.D. (Logic) in 1977 as part of the Ford Foundation's six-year Ph.D. Program—which had enabled my oddball trajectory as bookbinder (Art History), Gilbert & Sullivan character–makeup queen (tenor in the Gondoliers chorus!), caterer, thwarted applicant to the Culinary Institute of America. A couple years at MIT (did theater makeup at Harvard, catered an MIT logic conference) and a summer fellowship at Cambridge University ... inspired me to flee the classroom to do rock physics/computer vision R&D applying fluid dynamics, acoustics, electromagnetics, and computer vision to develop oil-well logging sensors for Schlumberger, as well as makeup for the community theater.

Charlotte Lin, Boeing, Inc.

Spouse Robert Porter advanced to Schlumberger VP for a new Engineering/Manufacturing Center in Tokyo as well as Fellow of the Acoustical and Optical Societies. During our Tokyo stint, I concurrently held visiting/adjunct professorships at University of Tokyo (Information Science) and University of South Carolina (Geology) and developed VLSI inspection automation techniques as Hitachi's first-ever foreign employee at their Production Engineering Research Lab in Yokohama.

When Robert accepted UW's EE chairmanship, I turned down a UW Radiology/Bioengineering soft-money offer (computer vision R&D on MRI, PET, CAT imagery) and joined Boeing. I started a Sensor Fusion Group, leading High Tech Center R&D in computer vision, adaptive control, target recognition and tracking that led to several patents and a $10m contract. After several years leading AWACS product development—resulting in >$500m in contracts, and then as program manager for AWACS EAGLE ($43m), I served six years as director for the Airborne Surveillance Testbed Program operating a highly-modified 767 with 2.5 ton, 52cm aperture infrared telescope. This spring, we retired AST after 99 missions collecting "truth data" for development of sensor and communications systems in space applications. I was recently named Chief Engineer of Boeing's multi-billion-dollar Australian Wedgetail Program (trivia: our highly-modified 737 aircraft will contain 116 miles of wire).

My corporate-wife career path produced 40+ technical publications (including classified) in math, physics, geology, geophysics, optics, computing architectures/applications, aerospace applications.

Outside work: two step-kids, five grandkids, two dogs, two homes, four DSL drops for three servers and four laptop client workstations, four cars, many theater/skiing/bicycling vacations. We actively sponsor Oregon Shakespeare Festival productions; last fall I fed Chinese home-cooking to 30 artists launching two plays developed for OSF and the Berkeley Rep (Robert and I helped underwrite the commissioning) which opened this February and just got invited to London for next March! I'm a volunteer dogwasher for the King County Humane Society and serve on the Board of the Asian Counseling & Referral Service and also as Puget Sound ArtsFund Associate, Boeing Ski Club Treasurer, and an Executive Champion for the Boeing Association of Asian Pacific Americans.

APPLIED MATHEMATICS RESEARCH AND LEADERSHIP WORKSHOP

On October 8–10, 2003, the Women of Applied Mathematics Research and Leadership workshop was held on the University of Maryland's College Park Campus. This workshop, sponsored by the US Department of Energy with local support from the University of Maryland Computer Science Department and the Center for Scientific Computing and Mathematical Modeling, was organized by Tammy Kolda from Sandia National Laboratories and Dianne O'Leary from the University of Maryland, College Park. The schedule was a mixture of panel discussions and diverse research talks given by ten senior women researchers and twenty-five early career women.

Chuck Romine (Department of Energy), Deborah Lockhart (National Science Foundation), Linda Petzold (University of California, Santa Barbara), and Cynthia Phillips (Sandia National Labs)

The opening address by Tammy Kolda and Dianne O'Leary gave us an overview of the issues faced by women in applied mathematics. Some of these issues are faced by all women—like the assumption that you are the spouse of a professional rather than a professional in your own right, and the mobility limits felt by women when they seek promotion. Specifically relevant to applied mathematicians was the rather shocking fact that, even though approximately 30% of Ph.D.'s in applied mathematics are awarded to women, only 6% of the faculty positions in the top twenty applied mathematics programs are held by women.

The panels discussed becoming a senior research or project leader; writing a fundable proposal; obtaining merit promotion by setting priorities and taking action; becoming a chair, dean, or manager; leading and serving the profession; mentoring younger colleagues; and brainstorming what we can do to foster change. Each panel session provided insight into different strategies and opportunities that we can choose to pursue. A great deal of valuable advice was given. One thought-provoking concept of the workshop was that of taking from it what each of us could see working for ourselves. Rather than allow ourselves to be overwhelmed by all we could do, we must realize that none of us can do everything, but that we have long careers in which to build on our strengths. All the senior participants provided a different viewpoint because each had different experiences. Some of their common themes included the need to be solid in our research careers before taking on too many administrative and service components and the need to prioritize carefully.

The research talks came from a variety of fields within applied mathematics such as numerical analysis,

K. Renee Fister and Maeve L. McCarthy, Murray State University

Barbara Keyfitz (University of Houston), Joyce McLaughlin (Rensellaer Polytechnic Institute), Mary Wheeler (University of Texas), and Margaret Wright (Courant

The woman in the background is Naira Hovkimyan (Virginia Polytechnic Institute). In the group, clockwise starting with the woman at the left, are: Karen Devine (Sandia National Lab), Cynthia Phillips (Sandia National Lab), Jodi Mead (Boise State), Suely Oliveira (University of Iowa), Carol Woodward (Lawrence Livermore National Lab), and Margaret Wright (Courant Institute)

ordinary and partial differential equations, optimization, control theory, discrete mathematics and mathematical biology. The quality of the talks was excellent. This unique conference afforded us the opportunity to think about collaborations with women in our fields.

The closing session addressed items that we could do to facilitate change. Suggestions ranged from making sure our universities do well-designed salary equity studies to analyze the career paths of male and female mathematicians to seeing if longevity compensates for maternity choices. Maternity challenges were discussed throughout the workshop in the context of what can we do to promote parental policy on each of our campuses. The University of Maryland, Baltimore County and Harvey Mudd College have recently enacted policies that have allowed women and male faculty members to have such leave. Furthermore, the need to increase the participation of women as plenary speakers at national meetings was discussed. Potential solutions included organizing meetings with themes in which women are established experts and making conference committees diverse in not only gender but also in seniority and ethnicity.

All in all, the conference provided food for thought—a lot of it! It gave us opportunities to form collaborations with other solid researchers. It allowed us to discuss issues that are dear to our hears and to probe for answers to some of our questions.

AFTER TENURE: WOMEN MATHEMATICIANS TAKING A LEADERSHIP ROLE

(A WORKSHOP DEDICATED TO THE MEMORY OF RUTH MICHLER)

Supported by the University of North Texas and the National Science Foundation
through Ruth Michler's POWRE grant

Announcement: The AWM will hold a workshop at the University of Maryland, College Park, during the weekend of March 12–14, 2004. The workshop will prepare women who have already established careers in the mathematical sciences to become leaders in the profession. The target audience will be women who are tenured (or nearly so) at academic institutions but have not yet reached the level of leadership (typical applicants will have been tenured within the past five or six years, but there is no absolute cut-off) or women who are at a similar level in an industrial or government position. The workshop will bring together this audience with senior women who are leaders in the profession.

Format: Leadership activities will include panels, informal discussions and case studies. The panels and discussions will address issues concerning being a department chair or college administrator, being involved in the professional societies, being a research leader, and being an effective mentor. Mathematical activities will include expository talks.

Applications: Applicants must be women holding tenure or equivalent experience and must have a work address in the US. The applicant's research must be in a field that is supported by the Division of Mathematical Sciences of the NSF. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.)

Each applicant should submit *five copies* of each of the following: 1) a cover letter; 2) a curriculum vita; 3) a statement explaining the applicant's experience and interest in leadership posititions; and 4) a supporting letter from a senior mathematician (e.g., the chair of the applicant's department).

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

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

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

Target date: **January 20, 2004**. If the target date has already passed, you are welcome to contact the AWM office to see whether applications are still being accepted. Applications via email or fax will not be accepted.

A MATHEMATICAL MEMOIR

I've been inspired to write this short memoir of some of my childhood experiences related to mathematics by the fascinating accounts in the series "Non-Standard Careers" that Ginger Warfield is editing for the newsletter. My story is not appearing in that series, as my career path, entirely in academia, has been fairly traditional. I began this particular trip down memory lane while developing a book with Bettye Anne Case (working title, *Complexities: Women in Mathematics*, to appear Princeton University Press, ISBN 0-291-11642-5). Some of the original contributions to the book, especially its final part, resonated vividly with me. Bettye Anne encouraged me to expand on some of the resulting reminiscing I did in our email conversations.

I loved arithmetic from day one; I remember happily drawing circles around groups of sticks on a worksheet the first day of first grade, first following dotted lines on the page and then figuring out where to put lines (by counting things out) all by myself! It was a lot of fun to do the 100 addition or multiplication facts very very fast; I realized quickly that if they were presented in order, you didn't even need to think, just let the pencil fly! The next major excitement over school math that I remember feeling was in ninth grade geometry. Until that time, I felt that teaching people how to read would be life's highest calling. Algebra was easy (although I wasn't completely satisfied with the book's description of why the product of two negative numbers is positive, I could follow the rules). Geometry was more interesting and more challenging. My teacher, a teddy bear of a man who was the object of many a crush, tried hard to inspire his better students to go beyond the book (I'm not quite sure what it means that a few years later, he resigned teaching to join the FBI). Proofs were lots of fun; I realized that if I couldn't figure out a proof, probably I needed to draw an auxiliary line, although this insight didn't necessarily help me figure out where. And I began to think that teaching math would be a great job.

In conversation with other adult mathematicians over the years, I haven't found much consistency in whether or not arithmetic was a favorite subject, but being turned on to math by geometry seems very common. It has been alleged that more men become mathematicians than women due to superior spatial-visualization abilities, fostered by the activities boys engage in while at play. Whether this is true or not, certainly many women mathematicians have engaged in "tomboy" activities as they grew up—I spent many happy hours playing "Capture the Flag" and "Kick the Can." Most of the time my brother Bill was happy for me to work on his Erector set with him, and in our house, the blocks were available for any of us to use. I learned a lot about how things fit together through these latter activities. We daydreamed about how we would spend $100 (a lot of money back then) on more parts for the Erector set, or on millions of Legos, etc. (As an adult I discovered that I still wanted millions of Legos, and now have quite a collection that I use to make a cardtable-top display each holiday season.)

It has also been said that learning basic carpentry skills hones the development of visualization skills. I well remember a box that Bill and I made from leftover two-by-fours from some household remodeling project; we planned and measured carefully as we built one of the heaviest boxes with less than a cubic foot of interior capacity on the face of the earth. We were so proud of our plans when that *very* heavy lid fit so snugly into place.

Maybe I should mention that there were a lot of "us" in the house when I was growing up. I am the eldest of ten, six boys, four girls, nine living (sadly, Bill died quite suddenly at the age of 45). There was me, then four brothers, then Jane, eight years younger than me. Four more down to Amy, who is eight years younger than Jane. Also, I was one of the oldest children in the neighborhood; there were two older boys who wouldn't have anything to do with the rest of us, then me. The next oldest girl was I think five years younger than me, quite a chasm if you're not in the same household, so in the neighborhood I played with boys. Of course I had girlfriends from church or school, but I usually went to their houses (somewhat to my mother's dismay, she didn't think it was fair to the other mothers), to avoid the plague of brothers and little sisters.

Although I loved my dolls, I was very interested in "scientific" things. One Christmas Bill and I asked for a chemistry set together. We had an enormous amount of fun with it, singly and together, Mom's rules being simple: in the basement only, and no explosions. We collected seeds from weeds/grasses by running the stems backward through the holes of a plastic shaker top—I

Anne Leggett, Newsletter Editor

was convinced this would have made wonderful bread for the pioneers. I theorized about making cloth from pussy willow fuzz—it seemed obvious it would make a lovely soft sweater, but it sure was hard removing it from the catkins, and I had no idea how to spin it into yarn.

I bought a Visible Woman™ with Christmas money one year and tried to use my oil paints to give the organs their proper colors, which didn't really work out. Another year I asked for a microscope, but it was never quite the same after I tried to clean off what I thought were spots on the lens, not realizing they were floaters in my eyes. A "dissecting kit" came with the microscope; I tried to dissect grasshoppers, but they were too tough and broke my dissecting needle. And then there was my globe—I took the stand apart to "see how it worked," but the metal rod representing the earth's axis was slightly bent, and I could never get it properly back together again. Despite the failure of many of these experiments, I had a wonderful time.

My mother told me all about finding areas of oval tabletops by using lots of little triangles and showed me her poster on the Pythagorean theorem that she had saved from her high-school days. She told us about infinity to stop the game "who can name the biggest number" (clearly we were driving her crazy); no one on the playground would believe us. We learned about negative numbers, although we didn't call them that, by playing card games. My dad knew I liked numbers, so he put a receipt book and some other things like that in my stocking one year; I thought this was so totally cool. Later, Dad brought me back a book on genetics he had picked out for me on a business visit to an educational publisher, being sure it would appeal. I had a great time making charts for the Mendelian crosses and so on.

Through Bill, a year behind me in school, in junior and senior high I was connected to geek culture; we all read *One, Two, Three ... Infinity* by George Gamow. This book inspired me much more than any math or science schoolbook ever did; every summer I tried to

NSF-AWM MENTORING TRAVEL GRANTS FOR WOMEN

The objective of the NSF-AWM Mentoring Travel Grants is to help junior women to develop a long-term working and mentoring relationship with a senior mathematician. This relationship should help the junior mathematician to establish her research program and eventually receive tenure. AWM expects to award up to seven grants, in amounts up to $4000 each. Each grant will fund travel, accommodations, and other required expenses for an untenured woman mathematician to travel to an institute or a department to do research with a specified individual for one month. Awardees may request to use any unexpended funds for further travel to work with the same individual during the following year. In such cases, a formal request must be submitted by the following February 1st to the selection committee, or the funds will be released for reallocation. (Applicants for mentoring travel grants may in exceptional cases receive two such grants throughout their careers, possibly in successive years; the second such grant would require a new proposal and would go through the usual competition.) For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Eligibility. Applicants must be women holding a doctorate or equivalent experience and with a work address in the US (or home address if unemployed). The applicant's research may be in any field that is supported by the Division of Mathematical Sciences of the National Science Foundation. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.)

Each applicant should submit *five copies* of each of the following: 1) a cover letter (if a prior AWM-NSF mentor grant has been awarded, indicate so); 2) a curriculum vita; 3) a research proposal, approximately five pages in length, which specifies why the proposed travel would be particularly beneficial; 4) a supporting letter from the proposed mentor (who must indicate his/her availability at the proposed travel time), together with the curriculum vita of the proposed mentor; 5) a proposed budget; and 6) information about other sources of funding available to the applicant. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. Send all application materials to: Mentoring Travel Grant Selection Committee, Association for Women in Mathematics, 4114 Computer & Space Sciences Building, University of Maryland, College Park, MD 20742-2461. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu). Applications via email or fax will not be accepted. The deadline for receipt of applications is **February 1, 2004**.

understand more of the chapters (I'm not sure I ever did understand the wormy apple!). I later learned that many mathematicians of my generation, including my co-author Bettye Anne, had also had similar experiences with Gamow's work.

Although at times I wanted desperately to fit in better, I liked being "smart" and never considered abandoning the study of math. Having decided that teaching math was the best career imaginable, as I continued my education I learned that despite all the gender issues, being a math professor at a university was exactly where I would "fit in."

Elizabeth City State SKHS Day Essay Contest Winners

SKHS MATHEMATICS DAYS

Sonia Kovalevsky High School Mathematics Days are funded through grants from the National Security Agency and Coppin State College. Thanks to our funding agencies!

The organizers of each program are asked to submit an activity report, to provide a valuable resource for others to consider when setting up their own programs.

Elizabeth City State University

Our featured activity was a "Want To Be Like Her" Essay Contest. Students were provided biographies of women mathematicians and scientists in their registration packages along with a form on which the essay was to be written. Several of the workshops and displays provided additional information on women in science, which the girls could use in their essays. Girls were directed to review two or more biographies and to express their desire to pattern their careers after the selected women. Essays were reviewed and winners were selected. The essays were read during the luncheon and the winners were presented with trophies. This workshop provided the girls with both information on careers in mathematics and information on female mathematicians (role models).

Each girl was provided with an essay form in her registration packet. Along with the essay form were biographies of female mathematicians, female mathematics educators, and female scientist. The essay form was designed so that students could write on the front and continue the essay on the back of the form if more room were needed. The form also contained several questions, which were given at the top of the form: Your Name? Your School? Your Grade? Her Name? Her Occupation? Employer or Department where she works? The remaining space on the form was blank to allow girls to write their essay. They were to use this space to explain: Why you want to be like her.

The 2003 winning essays follow.

Her Name: Mary Kay Tornrose

Her Occupation: To help reshape mathematics teaching

Employer or Department where she works: The mathematics coordinator for the Public Schools of Newton, Massachusetts

Why you want to be like her: Because she puts her students and other students before herself. She goes each

Linda Bailey Hayden, Elizabeth City State University

Elizabeth City State SKHS Day

day to help change the world of mathematics and help reshape the world of math for the better. Mary Kay Tornrose is a very special woman. She works as the math coordinator for the public schools of Newton, Massachusetts. She goes out in the world each day to improve schools and their mathematics. She helps to make math known to many people. She tries to broaden the perspective of what the success in math is. Many people feel that they don't need math, but you do if you want to make it in this world. She knows that to put those people and those young minds before hers is spectacular. To take all that math that she has gained and to share it with others is really a thrill. To know that someone like her is out there really gives hope. Mrs. Tornrose says that she has always liked math. She has taught at elementary schools, middle schools, and high schools to emphasize the conceptual understanding of math. One of Mrs. Tornrose goals is to keep the teachers and students of many schools informed on how important math really is. Mrs. Tornrose takes math to new heights and shows that math is not just a man's world. Mrs. Mary Kay Tornrose is truly a remarkable woman and only one of many to come.

Her Name: Dr. Fern Hunt

Her Occupation: Ph.D. in Mathematics

Employer or Department where she works: Howard University

Why you want to be like her: I feel that Dr. Fern Hunt is a successful black woman who knew no boundaries when it came to excellence. She is a self-directed assured person who is very assertive. She shows that you can come from the worst of times and with hard work, anything is achievable. She has made me realize that I could change the world with math. That to me is a woman.

Her Name: Janet Norwood

Her Occupation: Federal Government Employee

Employer or Department where she works: Federal Government

Why you want to be like her: I want to be like Janet Norwood because she was a past-president of an American Statistical Association. And the fact that she can go to her job and like it is pretty cool. And that she can actually say that she likes her job even when it is difficult & challenging at times. Where she works she has a good staff and is proud of them. Janet has an interesting and important job. She is a Commissioner of the Bureau of Labor. Her job is the most important job in all of the jobs in the federal government. In her job she oversees about 3000 government employees that collect and analyze data on labor. But these are most of the reasons I would like to be like Janet Norwood. She's actually pretty neat. And she seems to be a very successful person. And also she seems to be successful in life, and very good in math. So that is why I want to be like Janet Norwood.

Her Name: Beverly Anderson

Her Occupation: Mathematics Teacher

Employer or Department where she works: University of District Columbia

Why you want to be like her: She's one of the few African Americans doing something positive with their lives. Not that that's a bad thing. I am 13 years old and I want to do something with my life, reading articles about people like Mrs. Beverly Anderson. The article states that she is a woman of deep beliefs. Me, myself as a young woman at the age of 13, I know someone is making a difference. Beverly also strives to bring people together, in a respectful, and honest manner. I used to think that math was not that serious, but thanks to the people who sponsored this women's mathematics program I know that math is in everything we do. Just like Beverly Anderson, I believe that I can learn anything that I put my mind into. Beverly grew up in New Orleans and she was there when the segregation was going on. It's hard to be a success when people are downing you or making your self-esteem lower. I haven't always excelled in math, but I can say, I can be if I want. Math is like any other skill. You make yourself good or great, or maybe even excellent.

Mount Mary College SKHSMD

The second annual Sonia Kovalevsky High School Mathematics Day (SKHSMD) was held at Mount Mary College, Milwaukee, WI on Friday, October 10, 2003. There were a total of 46 tenth, eleventh and twelfth grade women students, four tenth grade men students and three teachers from four area high schools. Our featured activity is the "Math Games and Puzzles" workshop, which was held in two sessions.

We went over the following:

1. The pennies game.
2. Chocolate candies puzzle.
3. Crossing the river puzzle.
4. Covering a chessboard with dominos.
5. Weight of a brick problem.
6. Milk distribution puzzle.
7. Four tree puzzle.
8. Rectangular illusion problem.
9. Geometrical dissections puzzle.
10. The two clocks puzzle.

AbdelNaser Al-Hasan, alhasana@mtmary.edu

As a part of the program, students were given a packet containing games and puzzles to take home. The general idea was to involve students in activities related to solving math puzzles and playing math games. This required the proper mindset. To facilitate the transition, easy puzzles were offered first in order to achieve participation as broad as possible. We constantly reinforced the principle that if each student contributes a little, the group will be able to make progress and even at the end be able to solve the puzzle. Therefore our time was divided into three distinct types of activities:

(a) Introduction to a puzzle or a game by the speaker

(b) Students working in groups

(c) Discussion of results of each group

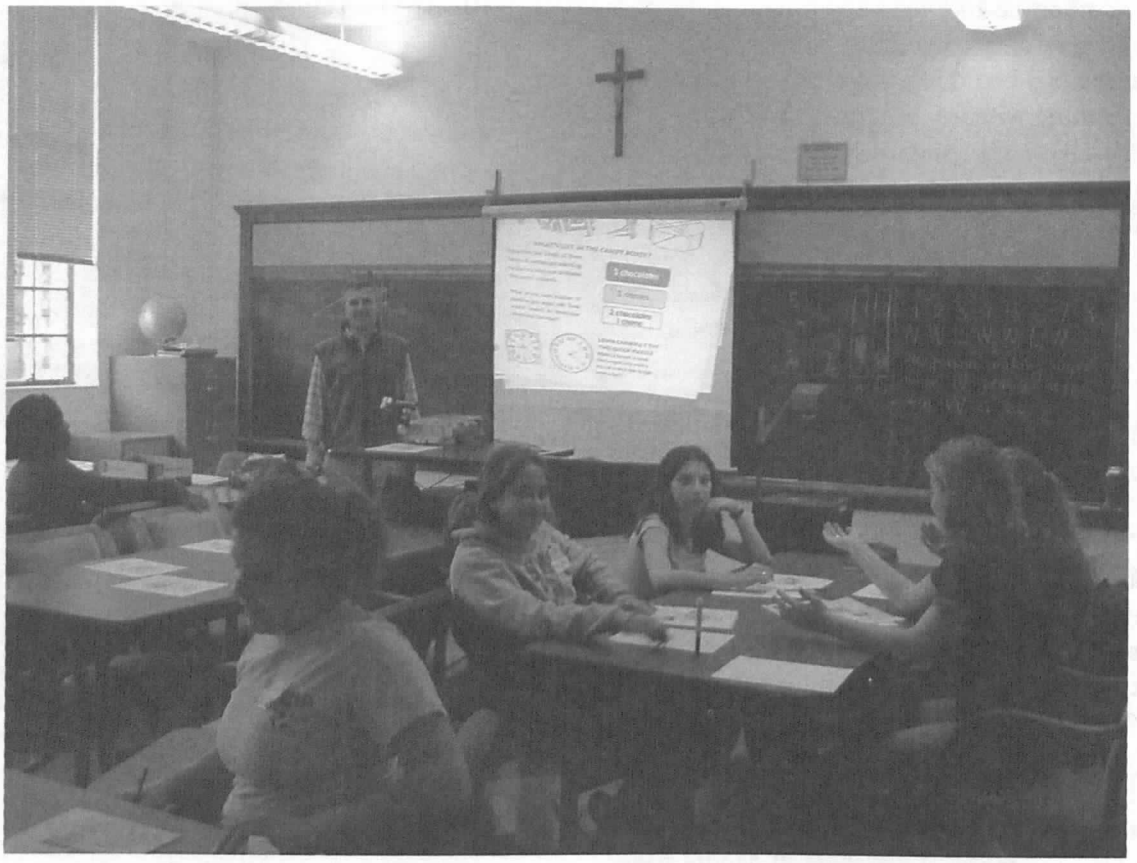
During type (b) activity the presenter circulated around, providing hints or asking leading questions. This way he had an idea on each group's progress. During the general discussion, weak groups were given the first priority to explain their conclusions.

Before the session the tables and chairs were arranged to facilitate student-to-student interactions. Work was done in groups of four or five. Each table could accommodate one group. Tables were placed perpendicular to the front blackboard. On each table we put pencils, erasers, scratch paper, scissors (the safe kind), about 20 pennies, 6 dice, etc.

Students arrived at the classroom where the session was held in groups. Each group represented a different high school. They quickly began exploring the equipment they found on their table.

To make the transition smooth we started chatting together about the kinds of games that students were familiar with. They mentioned football and soccer. We discussed such terms as: rules of a game, purpose of a game, a winner, a position in a game, the best move in a particular situation, playing for fun or for money. One student explained that in order not to expose yourself to too much risk you need to play a game in a conservative way. She suggested a conservative strategy that you apply if you do not know what is going on, where hopefully the opponent is going to make a mistake that you can take advantage of and win.

We decided to start with the *brick & balance* problem. Since the problem was so easy, every student

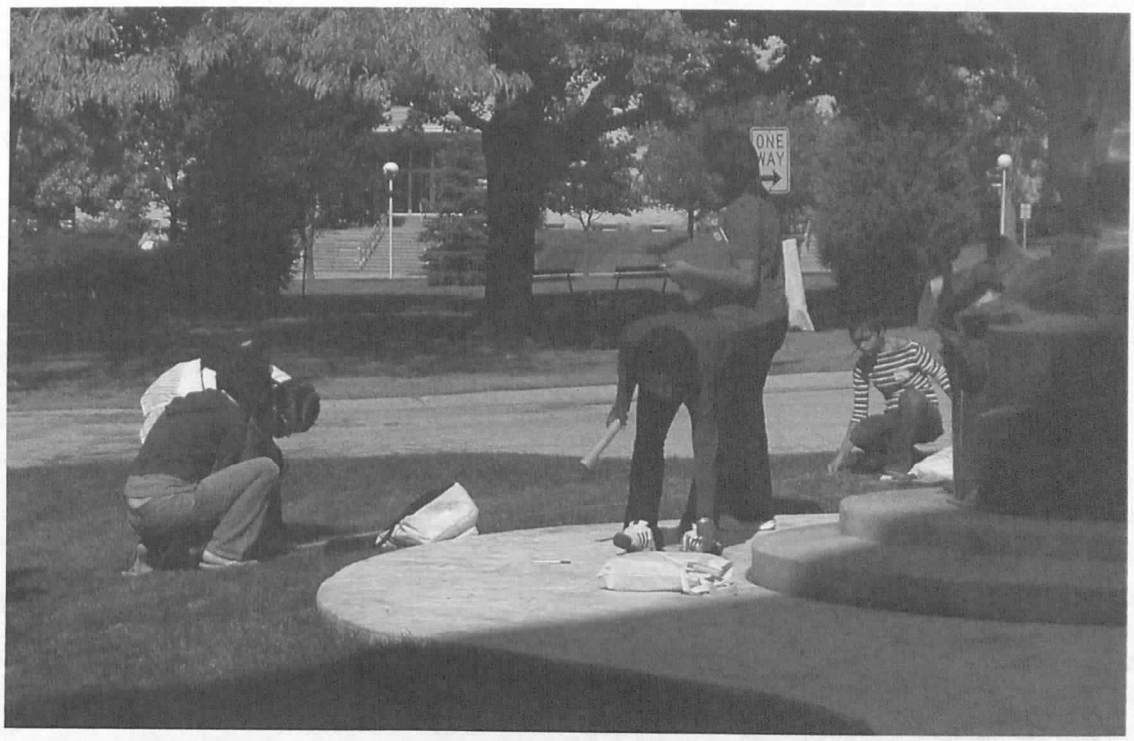


Puzzles Workshop at Mount Mary SKHS Day

that paid attention was able to provide either a complete solution or an essential part of the solution. Normally, in school, students set up one linear equation with one unknown, and then they solve the equation and interpret the solution to get the answer to this problem. Once students learn it, this is a universal procedure, i.e. applicable to many similar problems. But the fact that we saw other approaches suggests that setting up equations is not a natural thing to do, at least at this age. The encouraging sign was that most of the students were actively participating. They were enthused by the idea that other students were making contributions to the solution. The steps were not too difficult and were obvious to many students. The brick and balance problem took about seven to ten minutes.

Next we played the *one or two pennies off the table* game. The amazing thing was that some students were making spontaneous variations to this game. To mention just two outstanding examples, they started playing games in teams, or three or more person games. Some students realized that what they needed was a strategy to win the game. There were a few false attempts to construct such a strategy. It became somewhat easier to find a winning strategy for games with a small number of pennies. I remember one shy person that I approached with the offer to play the game. The person reluctantly agreed, and even with my best efforts I quickly lost two games in a row. My lost games were discussed in that group and the conclusions of that discussion contributed partially to the solution. The common effort of all groups resulted in finding regularities that led to the discovery of a winning strategy. The bottom line of this part of the games and puzzles session was the conclusion that one can solve math problems by using games and a competitive spirit (hands-on or realistic approach).

The next thing that we tried was *covering a chessboard with dominos*. Students were very busy with the puzzle. They counted the number of squares in a modified chessboard to make sure there was an even number of them. Some observed that the modified board



Scavenger Hunt Workshop at Mount Mary SKHS Day

has 32 white squares but only 30 black squares. After a few minutes of unsuccessful trying, I provided students with the hint that each domino can cover exactly one white and one black square, regardless of the position of the piece on the board. Students quickly realized that this is the reason that the board can't be covered with dominos as in the rules of the puzzle.

The game/puzzle *labels on candy boxes* was more fun then I first realized. Students and I had a hard time finding the solution because we wanted to solve a puzzle. The right approach was to think in terms of a game, i.e., choose a box, taste one candy from that box, and see what conclusions could be drawn in various cases. Then either continue by choosing a second candy from the same box, or start from the beginning by choosing a first candy from a different box. Since this puzzle can be solved by tasting only one candy, one can arrive at the solution rather fast.

For *the two clock* puzzle students were given a relatively short time to think about it. The general discussion was not very promising at first. I asked a question: "In what situations in real life does a clock show the correct time only twice per day?" Somebody asked: "At what time does the clock shows the correct time?" Somebody added: "You would not know unless you have other clocks working fine all the time." Then I wondered loudly: "How often is a broken clock correct?" Naturally many students knew the answer to that question: "Twice per day". One student said: "In real life clocks go fast or go slow or stop for good." The idea that a slow clock can show the correct time once per year was not surprising to anybody. We computed together how slow that clock has to be. There was a question: "How about fast clocks?" and the answer: "For the types of questions we considered, fast clocks can do what slow clocks can do."

At the end, when students were busy leaving, one group approached me with *the four oak puzzle*. They spent some time thinking about it and were inclined to conclude that maybe it is impossible to do what was required in that puzzle. We opened a real chessboard, and using pennies and dice, I showed them a solution. They were very interested despite my earlier decision not to give this puzzle high priority in the workshop. This puzzle happened to be on top of their goodby packet. The puzzle is rather geometrical in nature and the solution is not easily found. For me it was hard to decide how I could help students with hints and leading

RSA Workshop at Mount Mary SKHS Day

questions in this puzzle.

The game of Hex is one that students at every level of their education can come back to and learn something new. From topological considerations, it follows that somebody always wins this game, because every partition of the board into black and grey hexagons ends up with at least one path for black or grey. By reasoning that backtracks positions in any finite game and the finiteness of this game, one can see that somebody has to have a winning strategy. But the incredible thing is that to this day nobody knows what the winning strategy is! In a logic course in a college setting this would be an example of a proof of existence in a existential statement without giving an example. The convincing argument at the level of high school students of some of the issues above would probably be hard to come by in the time allowed, but the statements are certainly easily understandable, especially for student with some experience in playing mathematical games.

The *rectangular volume illusion* puzzle requires three-dimensional imagination in combination with some logic. I found out that there were basically two distinct approaches to obtaining the solution to this puzzle. In one approach students computed easily the value of a full rectangle and then subtracted the missing volume or the number of missing blocks. The second approach consisted of computing volume layer by layer. In both cases students were able to obtain correct solutions. While observing the students working on this puzzle, I saw many more students than usual making lots of effort. Somehow the students seemed to feel that it was the moment for them to shine.

The *geometric dissection* puzzle was not the kind of success that some of my fellow instructors and I had envisioned. Maybe the reason was that it required more time to compute and realize the shocking mismatch in areas. We computed area, all students together, with the help of a projector and laser pointer. We kept our

computation right next to the screen on the front blackboard. Some students may have been rusty and did not remember the formula for the area of a right triangle. This particular puzzle might have had better success if the students had the time to cut the pieces for themselves and assemble them afterwards in the second arrangement. My solution to this puzzles elicited voices from the room: "Cheating".

I ran out of time and was not able to talk about all the puzzles. In fact, since I was not sure how fast I would be able to proceed, I had by design a few extra puzzles just in case there was time. The students were given only one puzzle at a time, a few minutes before we were going to talk about it. The remaining puzzles that we did not cover during the regular workshop time, students were given to take home shortly before the end of the session. The order of each packet was arbitrary except for the top page and the second page. During the summary and conclusion part of each session, students were asked:

1. Which puzzle among those done in the workshop did they like the best?

2. Do they remember any games or puzzles from outside the workshop?

3. How do they feel: were the puzzles overall too difficult or too easy?

4. Would they like to get more help or less help while thinking about the puzzles?

5. Should we have a longer or shorter session?

6. How could we have done better?

7. Is there anything that they learned that they would like to share with their friends outside of the workshop?

Here is the list of puzzles I was not able to squeeze into this workshop:

- The square transformation.
- The chaos game.
- The rebate game.
- The block letter puzzle. (In fact the only reason I kept this puzzle around was to have something if students have were having a hard time or were not interested in exercising their minds. This type of puzzle is familiar to American students.)
- Are all wheels round puzzle.
- Bug in the shoebox problem. (This puzzle is somewhat misleading. Wrong solutions could be defeated without using calculus; simple right triangle geometry is enough.)
- Two magicians on the bus. (This puzzle is more difficult and deals with numbers. It is good for patient students. My hope was that maybe one or two students would try to think about it at home.)

North Dakota State University

Our participants had the opportunity to learn a little about game theory in Jorge Calvo's workshop, "The Game of Nim." The website www.transience.com.au/pearl.html features an interactive version of this game, and the girls were invited to play against "Juan," a mischievous computer character. In this, the misère version of Nim, the players are presented with three rows of pearls, containing three, four, and five pearls, respectively. They are allowed to remove as many pearls as they would like from one horizontal row during each turn, and the object is to force the opponent to pick up the last pearl. (In the traditional game, the person who picks up the last pearl wins the game.)

After a couple of games with the computers, the girls were each given poker chips in three colors so that they could set up the game at their desks. Working out a few examples, they saw that there were some scenarios in which they could always win, and others in which they could not win (barring opponent error). The group discussed the concepts of winning strategies and how to recognize when one exists.

The girls were shown how to utilize a backwards analysis, starting with the smallest possible case (just one row with one pearl, an obvious loss) and working up. They were then given two 10 x 10 grids on a sheet of paper where, in each space, they could record whether or not a winning strategy existed in the corresponding game scenario. (For further details, see below.) After filling in a few entries, they began to see how previous win/loss entries could be used to determine subsequent entries.

After trying out their strategies using the poker chips and playing against one another, the girls again tried the

Karen (Horton) Staley, karen.horton@ndsu.nodak.edu

computer. This time, they were pleased to have the experience of winning against the obnoxious character. As evidenced by their comments on the evaluations, they enjoyed the opportunity to work out strategies using the poker chips and to do "hands-on" mathematics.

For the grids: For instance, looking at the third row, fourth column of the grid, they were invited to consider the case where the first row had four pearls and the second row had three. Since they could find a winning strategy for that case, they wrote "1" in that space on the grid, while writing "0" in spaces where no winning strategies could be found. (The winning strategy is to remove a single pearl from the row with four pearls.) For building from previous entries, once the girls determined that (2, 2) had no winning strategies, they considered (2, 3). Here, removing one pearl from the second row would then present the opponent with the (2, 2) scenario, so a winning strategy did exist for (2, 3).

The girls used the second grid to record possible wins/losses for the case where a third row held only one pearl. For instance, in the second grid, the (2, 2) entry corresponded to (1, 2, 2), the case where the first row held only one pearl and the second and third both held two. Here, removing the single pearl from the first row would present the opponent with a (2, 2) situation having no winning strategies. Thus, a "1" would be entered in the (2, 2) space on the second grid.

OPPORTUNITIES

SPWM 2004

The Summer Program for Undergraduate Women (SPWM 2004) is a five-week (June 26 to July 31, 2004) intensive program for mathematically talented undergraduate women who are completing their junior year and may be contemplating graduate study in mathematical sciences. Sixteen women will be selected. Each will receive a travel allowance, campus room and board, and a stipend of $1,500. Applications must be postmarked by **March 1, 2004**.

For further information, contact the director, Professor Murli M. Gupta (mmg@gwu.edu, 202-994-4857) or visit www.gwu.edu/~math/spwm.html.

Budapest Semesters in Mathematics Program

This program allows third and fourth year undergraduates to spend a semester or year studying mathematics in Budapest, Hungary. Admission criteria are high, but the rewards are great. A semester immersed in the mathematical culture of Budapest is an intellectual adventure of the very first rank. Information, including pictures and an electronic application form, is available online at www.stolaf.edu/depts/math/budapest. Presently, the program can accommodate about 65 students per semester. The application deadlines for fall 2004 and spring 2005 are **April 30, 2004** and **November 1, 2004** respectively; early applications (by as much as a year) are encouraged.

AWARDS AND HONORS

STEPHANIE BALLOM, a freshman at Mansfield High School, Mansfield, TX and student member of AWM for two years, just won the Texas State Girls Chess Championship with a perfect tournament score. For her effort she will receive a full four year scholarship to the University of Texas at Dallas.

The Somerville Mathematics Fund (www.somervillemathematicsfund.org) in Somerville, MA, an affiliate of Dollars for Scholars®, has the national Dollars for Scholars Golden Tassel Chapter Service Award. The fund was chartered in September 2000 to celebrate and encourage achievement in mathematics in Somerville, MA and in the past three years the Fund has awarded seven college scholarships totaling $28,000.

Somerville offers grants to teachers who are creating exciting mathematical activities in the classroom. The chapter created an event called Pi Night in which high school students, teachers and community volunteers help other students and their parents play games, compute and recite π, make estimations and predictions and take Pi quizzes. Another chapter event is Metric Night in which students make estimations and mental calculations and compete in the "Metric Olympics."

AWM member ERICA VOOLICH is president of the Fund.

COLLABORATIVE RESEARCH GRANTS FOR WOMEN

Dedicated to the memory of Ruth Michler

Supported by the University of North Texas and the National Science Foundation
through Ruth Michler's POWRE grant

The objective of the Collaborative Research Grants is to enable women who are already tenured to carry out collaborative research at other institutions. (Women who are not yet tenured are referred to the Mentoring Grants Program.) The length of stay may vary from one week to several months, although only partial support will be provided for the longer stays. Each grant will fund travel, accommodations, and other required expenses for a tenured woman mathematician to travel to an institute or a department to do research with a specified individual. Typical grants will be under $4000, although higher amounts may be awarded in exceptional cases. All travel must be completed by August 31, 2004. For foreign travel, US air carriers must be used (exceptions only per federal grant regulations; prior AWM approval required).

Applications: Applicants must be women mathematicians with a work address in the US. Slight preference will be given to women who have been recently tenured or who have an equivalent level of experience in an industrial or governmental position. The applicant's research must be in a field that is supported by the Division of Mathematical Sciences of the National Science Foundation. (See http://www.nsf.gov/od/lpa/news/publicat/nsf03009/mps/dms.htm#1 for the list of supported areas.)

An application should consist of: 1) a cover letter; 2) a curriculum vita; 3) a research proposal (approximately five pages in length) which specifies why the proposed travel would be particularly beneficial; 4) a supporting letter from the proposed collaborator (who must indicate his/her availability at the proposed travel time), together with the curriculum vita of the proposed collaborator; 5) a proposed budget; and 6) information about other sources of funding available to the applicant. A final report will be required from each awardee. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM. If you have questions, contact AWM by phone (301-405-7892) or email (awm@math.umd.edu).

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

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

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

APPLICATION DEADLINE: Applications must be received by **February 10, 2004**.
Applications via email or fax will not be accepted.

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DIMACS Reconnect '04 Conferences: Current Research Relevant to the Classroom

The Reconnect '04 Conferences sponsored by DIMACS (the Center for Discrete Mathematics and Theoretical Computer Science) are geared towards exposing faculty teaching undergraduates to current research topics relevant to the classroom, involving them in writing materials useful in the classroom and reconnecting them to the mathematical sciences enterprise by exposing them to new research directions and questions.

The three programs: "Experimental Algorithmics, with a Focus on Branch and Bound for Discrete Optimization Problems" at Lafayette College, June 20 - June 26, 2004; "Folding and Unfolding in Computational Geometry" at St. Mary's College, July 11 - July 17, 2004; "Topics in Computational Molecular Biology" at DIMACS / Rutgers University, August 8 - August 14, 2004. Applicants accepted to participate will receive lodging and meals through NSF funding.

For more information or an application form, visit our web site at **http://dimacs.rutgers.edu/reconnect/.** Or, contact the Reconnect Program Coordinator, at **reconnect@dimacs.rutgers.edu** or **(732) 445-4304.**

VIGRE Traineeships in the Department of Mathematics UNIVERSTY OF MARYLAND, COLLEGE PARK

Applications are invited for VIGRE Postdoctoral traineeships at the University of Maryland, starting in Fall 2004. These positions are for recent Ph.D. recipients, with a preference for those not more than one year past the Ph.D. degree. Traineeships are only available to US Citizens and permanent residents. The Traineeship is for three years and is non-renewable. Candidates must have superior research potential and a strong commitment to teaching. The Department of Mathematics provides an excellent scientific environment to foster the professional development of junior mathematicians. The teaching duties consist of two courses per year. Trainees must participate actively in VIGRE Research Interaction Team activities. The salary is $47,000 per academic year, supplemented by a $6,500 summer stipend for the first two summers and a $2,500 travel fund each year. Priority will be given to applications completed by February 1, 2004.

The University of Maryland is an Equal Opportunity and Affirmative Action employer that strongly encourages applications from female and minority candidates. Please send a curriculum vitae and AMS Standard Cover Sheet, and arrange for three or more letters of recommendation, at least one of which speaks to the applicant's teaching credentials, to be sent to: **VIGRE Postdoctoral Traineeship, Department of Mathematics, University of Maryland, College Park, Maryland 20742.**

EDGE 2004:

Spelman College

ATLANTA, GA • JUNE 7 - JULY 2

Giving the EDGE to Women in Mathematics

The EDGE Summer Program Funded by the National Science Foundation and the Andrew W. Mellon Foundation, the Enhancing Diversity in Graduate Education (EDGE) Program, a post baccalaureate summer enrichment program, is designed to strengthen the ability of all women to complete graduate programs in the mathematical sciences.

The summer program consists of two core courses in analysis and algebra/linear algebra. There will also be minicourses in vital areas of mathematical research in pure and applied mathematics, short-term visitors from academia and industry, guest lectures, graduate student mentors, and problem sessions. In addition, a follow-up mentoring program and support network will be established with the participants' respective graduate programs.

Applicants to the program should be women who (i) have been accepted to a graduate program in the mathematical sciences or (ii) have just completed their first year of graduate school in the mathematical sciences. All applicants should have completed standard junior--senior-level undergraduate courses in analysis and abstract algebra and have a desire to earn the doctorate degree. Women from minority groups who fit one of the above two categories are especially encouraged to apply. Final acceptance to the program is contingent upon acceptance to a graduate program in the mathematical sciences.

In 2004 the summer program will be held at Spelman College in Atlanta, Georgia during June 7-July 2, 2004 with Professor Yewande Olubummo as local coordinator. The EDGE Program is co-directed by Sylvia Bozeman (Spelman College), Rhonda Hughes (Bryn Mawr College). A stipend of $2,000 plus room & board will be awarded to participants. Applicants chosen to participate in the program will be notified by April 15, 2004.

Applications should consist of the following: (1) a completed application form; (2) a statement describing the expected value of this program to the applicant's academic goals; (3) two letters of recommendation from mathematical sciences faculty familiar with the applicant's work; (4) a transcript and current resume (5) a list of graduate programs to which the applicant has applied, together with a ranked list of her two or three top choices.

The application deadline is March 1, 2004. Applications should be sent to: EDGE Program, Department of Mathematics, Spelman College, P.O. Box 270 Atlanta, GA 30314. For more information visit the program's website at http://www.edgeforwomen.org/.

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Research theme:
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From Policy to Practice:
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A three-week summer program for
graduate students
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mathematics researchers
undergraduate faculty
high school teacher
math education researchers

IAS/Park City Mathematics Institute (PCMI)
July 11-31, 2004
Park City, Utah

Organizers: Bernd Sturmfels, University of California Berkeley; Ezra Miller, University of Minnesota; Victor Reiner, University of Minnesota.
Graduate Summer School Lecturers: Alexander Barvinok, University of Michigan; Sergey Fomin, University of Michigan; Robin Forman, Rice University; Mark Haiman, University of California Berkeley; Robert MacPherson, Institute for Advanced Study; Richard Stanley, Massachusetts Institute of Technology; Michelle Wachs, University of Miami; Guenter Ziegler, Technical University-Berlin.
Other Organizers: High School Teacher Program: Gail Burrill, Michigan State University; Carol Hattan, Vancouver, WA; James King, University of Washington. Mathematics Education Research Program: Joan Ferrini-Mundy, Michigan State University; Timothy Kelly, Hamilton College. Undergraduate Students Program: William Barker, Bowdoin College; Roger Howe, Yale University. Undergraduate Faculty Program: Daniel Goroff, Harvard University.

Applications: www.ias.edu/parkcity
Deadline: February 15, 2004
IAS/ Park City Mathematics Institute
Institute for Advanced Study, Princeton, NJ 08540

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POSTDOCTORAL POSITION
Department of Mathematical Sciences

Rensselaer Polytechnic Institute is pleased to announce the availability of a postdoctoral position in applied mathematics and/or mechanical engineering with emphasis on the theoretical results and/or algorithm development for elastography problems. This position is anticipated to begin as soon as possible but could start as late as February 2004. The position is for one year, renewable for an additional year. Travel support to attend conferences will be provided.

Applicants should submit a letter of application, a curriculum vita, a description of research interests, and three letters of recommendation sent directly to:

Alice Baker, Department of Mathematical Sciences,
Rensselaer Polytechnic Institute,
Troy, NY 12180. Inquiries should be sent to
Professor Joyce McLaughlin (mclauj@rpi.edu)
or Professor Antoinette Maniatty (maniaa@rpi.edu)

Review of applications will begin one month after the posting of this announcement and will continue until the position is filled.

Rensselaer is an Equal Opportunity/Affirmative Action Employer.
Women and Minorities are strongly encouraged to apply.

IMA
INSTITUTE FOR MATHEMATICS AND ITS APPLICATIONS
University of Minnesota, Minneapolis, Minnesota

Associate Director

The Institute for Mathematics and its Applications (IMA) seeks a person to serve as Associate Director for two years beginning in August 2004.

The IMA is located on the Minneapolis campus of the University of Minnesota. Since its founding in 1982 as the result of a national competition, the IMA has been a major national institute with the mission of fostering research of a truly interdisciplinary nature and establishing links between mathematics of the highest caliber and important scientific and technological problems from other disciplines and industry, and of strengthening the talent base engaged in mathematical research applied to or relevant to such problems. The IMA receives most of its funding from the National Science Foundation. The IMA's programs and activities are documented on its web site, www.ima.umn.edu.

The Associate Director will work with the Director and Deputy Director on all aspects of IMA activities, especially program implementation, participant applications, publicity and special projects. Candidates should have a Ph.D. in mathematics or a related field, a successful record and broad view of mathematical research, a commitment to the IMA mission, and administrative or organizational experience. The Associate Director will work in the exceptional scientific environment provided by the IMA and contribute to shaping the international research agenda. Research activity is compatible with the position, and a visiting faculty position at the University of Minnesota may be arranged if appropriate.

Applicants should send a CV, a statement of their interest in the position, the names of at least three possible references, and possibly other relevant information. They may optionally have letters of recommendation sent. All materials should be sent by email to search@ima.umn.edu. Inquiries about the position can be made to this e-mail address or by phone to 612-624-6066. Review of applications will begin on January 15, 2004. Applications will be accepted until the position is filled.

The University of Minnesota is an equal opportunity educator and employer.

The IMA is an NSF funded Institute

UNIVERSITY OF MINNESOTA

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Summer Program for Women in Mathematics
June 26, 2004 to July 31, 2004

The George Washington University Summer Program for Women in Mathematics (SPWM) is a five-week intensive program for mathematically-talented undergraduate women who are completing their junior year and may be contemplating graduate study in the mathematical sciences. Goals of this program are to communicate an enthusiasm for mathematics, to develop research skills, to cultivate mathematical self-confidence and independence, and to promote success in graduate school.

ELIGIBILITY. Applicants must be undergraduate women at a US university or college, who are completing their junior year, or equivalent, and have mathematical experience beyond the typical first courses in calculus and linear algebra.

AWARD. Sixteen women will be selected. Each wil receive a travel allowance, campus room and board, and a stipend of $1,500.

PROGRAM. SPWM will offer a number of seminars led by active research mathematicians, with the assistance of graduate students. The seminars will be organized to enable the students to obtain a deep understanding of basic concepts in several areas of mathematics, to learn how to do independent work, and to gain experience in expressing mathematical ideas orally and in writing. No course credits or grades will be given. There will be panel discussions on graduate schools, career opportunities, and the job market. Weekly field trips will be organized to facilities of mathematical interest around the Washington area.

APPLY by **March 1, 2004** for full consideration. Early applications are encouraged. Applications are accepted only by mail. Application forms may be obtained from the director (Murli M. Gupta; spwm@gwu.edu; 202-994-4857) or may be downloaded from the program homepage: **http://www.gwu.edu/~math/spwm.html.**

Project NExT (New Experiences in Teaching)

Project NExT (New Experiences in Teaching) is a professional development program for new and recent Ph.D.s in the mathematical sciences (including pure and applied mathematics, statistics, operations research, and mathematics education). It addresses all aspects of an academic career: improving the teaching and learning of mathematics, engaging in research and scholarship, and participating in professional activities. It also provides the participants with a network of peers and mentors as they assume these responsibilities. Each year, about sixty faculty members from colleges and universities throughout the country are selected to participate in a workshop preceding the MAA summer meeting, activities during the summer MAA meetings & the Joint Mathematics Meetings in January, and an electronic discussion network. Faculty for whom the 2004-05 academic year will be the first or second year of full-time teaching (post Ph.D.) at the college/university level are invited to apply to become Project NexT Fellows. **The application deadline is April 16, 2004.**

For more information, see the Project NExT Web site, http://archives.math.utk.edu/projnext/.

Project NExT is a program of the Mathematical Association of America. It receives major funding from The ExxonMobil Foundation, with additional funding from The Dolciani-Halloran Foundation, The American Mathematical Society, The Educational Advancement Foundation, The American Statistical Association, The National Council of Teachers of Mathematics, The Association of Mathematics Teacher Educators, The Association for Symbolic Logic, & the Greater MAA Fund.

BINGHAMPTON UNIVERSITY – DEPARTMENT OF MATHEMATICAL SCIENCES – The Department of Mathematical Sciences at Binghamton University invites applications for a tenured position at the associate/full professor level in geometry/topology pending funding. (Position and salary are dependent on the successful applicant's qualifications.) Desired qualifications include: substantial research achievements, research grants, and a strong teaching record at the undergraduate and graduate level. Success or potential success in doctoral dissertation directing is also desired. A complete application consists of a curriculum vitae, a statement of research interests, and three letters of recommendation. These materials should be sent to: **Professor Ben Brewster, Chairman, Department of Mathematical Sciences, Binghamton University, Binghamton, NY 13902-6000.** Screening of applications will begin February 1, 2004. Binghamton University is an equal opportunity/affirmative action employer.

CARNEGIE MELLON UNIVERSITY – DEPARTMENT OF MATHEMATICS - The Department of Mathematical Sciences at Carnegie Mellon University invites applications for a position in Applied Analysis to begin September 1, 2004. Our intention is to appoint an individual who can provide additional leadership and breadth to our Applied Analysis program. This program, recognized worldwide, is centered on applications of partial differential equations. The successful candidate will be an internationally prominent mathematician with strong leadership abilities. Our expectation is that the appointee will join with us in taking our program to an even higher level of visibility and achievement. Applicants are invited to contact the head of the search committee, **Irene Fonseca, at the Department of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213.** The Department of Mathematical Sciences is committed to increasing the number of women and minority faculty. Carnegie Mellon University is an Affirmative Action/Equal Opportunity Employer & encourages applications from women and minorities.

CENTRAL MICHIGAN UNIVERSITY – DEPARTMENT OF MATHEMATICS - We invite applications for a tenure-track position in Mathematics Education beginning Fall 2004. Rank is open, but appointment to upper ranks requires recent success in attracting external funding. Candidates should have a doctorate in Mathematics Education or closely related field; ABD candidates will be considered if degree completion is imminent. Complete announcement available at http://www.cst.cmich.edu/units/mth/fsearch.htm. Submit letter of application, resume, copies of transcripts, a statement of teaching philosophy and a statement of proposed research plans, and have three letters of recommendation sent directly to: **Search Committee, Department of Mathematics, Central Michigan University, Mt. Pleasant, MI 48859.** Applications will be accepted and considered until the position is filled. CMU, an AA/EO institution, strongly and actively strives to increase diversity within its community (see http://www.cmich.edu/aaeo).

EASTERN MICHIGAN UNIVERSITY - DEPARTMENT OF MATHEMATICS - Eastern Michigan University, Department of Mathematics invites applications for two (2) tenure track positions at the level of assistant professor beginning fall semester 2004. A Ph.D. in mathematics or statistics is required. ***Position #F0415*** - The Department is part of a new interdisciplinary program in bioinformatics and is looking for a candidate to assist in expanding interdisciplinary programs with biology and other sciences. Submit a cover letter, a statement explaining the applicant's interests and qualifications for these duties, CV, teaching statement, research statement, and three or more letters of reference to: **Position #F0415, Eastern Michigan University, 202 Boone Hall, Ypsilanti, MI, 48197.** ***Position #F0416*** - Candidate will direct the small actuarial science program and help expand interdisciplinary programming in social sciences, economics and finance. Submit a cover letter, a statement explaining the applicant's interests and qualifications for these duties, CV, teaching statement and research statement, and three or more [➔]

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[←] letters of references to: **Position #F0416, Eastern Michigan University, 202 Boone Hall, Ypsilanti, MI, 48197.** Applicants must demonstrate excellence in teaching, must have excellent communication skills, and a strong research record with potential for continuing scholarly activity. Candidates will actively participate in departmental and professional service. Standard teaching load is 12 credit hours per semester. Applications will be reviewed beginning January 5, 2004, and will be accepted until the position is filled. Women and members of minority groups are encouraged to apply. EMU is an affirmative action/equal opportunity employer committed to faculty, staff and student diversity.

FRANKLIN & MARSHALL COLLEGE – DEPARTMENT OF MATHEMATICS - Visiting Assistant Professor of Mathematics - a full-time, one-year position beginning fall 2004. Ph.D. in Mathematics and/or Statistics. Ph.D. in Mathematics and/or Statistics. We seek applicants eager to teach and mentor undergraduates in a liberal arts setting. Excellence in teaching mathematics is the primary criterion for selection; other considerations include continued scholarly activity and the ability to contribute to our general education program. A normal teaching load is five curses per year. Send letter of application, AMS cover sheet, Curriculum Vita, list of courses taught, (including the applicant?s responsibilities), three letters of recommendation, (at least two that address teaching ability), and copies of undergraduate and graduate transcripts, to: **Annalisa Crannell, Department of Mathematics, Franklin & Marshall College, Lancaster PA 17604-3003.** See website listed below. We will begin reading applications on March 1, 2004. An affirmative action employer, Franklin and Marshall is committed to cultural pluralism through the hiring of minorities and women. For more information about the position or institution/company: http://www.FandM.edu/Departments/Mathematics/Mathematics.html/

INDIANA UNIVERSITY, BLOOMINGTON - DEPARTMENT OF MATHEMATICS – Zorn Research Postdoctoral Fellows - The Department of Mathematics invites applications for Zorn Research Postdoctoral Fellows beginning in the Fall of 2004. These are three-year, non-tenure track positions with reduced teaching loads. Outstanding candidates with a recent Ph.D. in any area of pure or applied mathematics or statistics are encouraged to apply. Zorn postdocs are paired with mentors with whom they have compatible research interests. The Department maintains strong research groups in all principal fields of mathematics, and the Bloomington campus offers an exceptionally attractive environment, providing a rich variety of musical and cultural attractions. Interested applicants should send a letter of application, vita, and research and teaching statements, and should arrange to have four letters of recommendation, including one letter evaluating teaching experience, sent to: **Search Committee, Department of Mathematics, Indiana University, 831 East 3rd Street, Rawles Hall, Bloomington, IN 47405-7106.** Indiana University is an equal opportunity / affirmative action employer. Applications received by December 15, 2003 will be given full consideration.

INDIANA UNIVERSITY, BLOOMINGTON - DEPARTMENT OF MATHEMATICS - The Department of Mathematics invites applications for two tenure-track or higher-level positions beginning in the Fall of 2004. Outstanding candidates with a Ph.D. in any area of pure or applied mathematics or statistics and with postdoctoral or faculty-level experience are encouraged to apply. The Department maintains strong research groups in all principle fields of mathematics, and the Bloomington campus offers an exceptionally attractive environment, providing a rich variety of musical and cultural attractions. Interested applicants should send a letter of application, vita, and research and teaching statements, and should arrange to have four letters of recommendation, including one letter evaluating teaching experience, sent to: **Search Committee, Department of Mathematics, Indiana University, 831 East 3rd Street, Rawles Hall, Bloomington, IN 47405-7106.**

LEHMAN COLLEGE – DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE - Assistant/Associate/Full Professor position (s) available starting September 2, 2004. Position(s) require an earned doctorate, commitment to research, teaching and departmental and college-wide service. Responsibilities include: Teach mathematics, computer science and/or computer application courses, participate in departmental and college-wide committee work, publish research articles in refereed professional journals. Develop grant proposals. Please send application, curriculum vitae and arrange to have three letters of recommendation sent to: **Prof. Robert Feinerman, Chair, Department of Mathematics and Computer Science, Lehman College, Bronx, NY 10468.** Review of applications will begin on January 20, 2004 and will continue until positions are filled. For a complete job description and salary ranges, visit the Lehman College website www.lehman.cuny.edu (link to job opportunities). Lehman College is an AA/EEO/ADA Employer.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS – Lecturer/Assistant Professor - The Department of Mathematics may make appointments, at the level of lecturer and assistant professor or higher, in pure mathematics for the year 2004-2005. The teaching load will be nine hours for the academic year (eight hours for assistant professor appointments). These positions are open to mathematicians with doctorates who show definite promise in research. Applications should be complete by January 5. Applicants should arrange to have sent (a) vita; (b) three letters of reference; (c) a description of their most recent research; and (d) a research plan for the immediate future to: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, 77 Massachusetts Ave., Cambridge, MA 02139-4307.** MIT is an Equal Opportunity, Affirmative Action Employer. (For more information about the position or institution: http://www-math.mit.edu.)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - C.L.E. Moore Instructorships In Mathematics - These positions are open to mathematicians with doctorates who show definite promise in research. The teaching load will be nine hours for the academic year. Applications should be complete by January 5. Applicants should arrange to have sent (a) a vita; (b) three letters of reference; (c) a description of the research in their thesis; and (d) a research plan for the next year to: **Pure Mathematics Committee, Massachusetts Institute of Technology, Room 2-263, Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer. (For more information about the position or institution: http://www-math.mit.edu.)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY - DEPARTMENT OF MATHEMATICS - Applied Mathematics Instructor/Assistant Professor - The applied mathematics group at MIT is seeking to fill possible positions at the level of Instructor, Assistant Professor, or higher, beginning September 2004. Appointments will be made based on demonstrated outstanding research qualifications. Candidates in all areas of applied mathematics, including physical applied mathematics, computational molecular biology, numerical analysis and scientific computation, will be considered. Current activities of the group include: combinatorics, operations research, theory of algorithms, numerical analysis, astrophysics, condensed matter physics, computational physics, fluid dynamics, geophysics, nonlinear waves, theoretical and computational molecular biology, quantum computing and quantum field theory, but new hiring may involve other areas. Please send curriculum vitae, research description, along with three letters of recommendation by January 5, 2004, to: **Committee on Applied Mathematics, Room 2-345, Department of Mathematics, M.I.T., 77 Massachusetts Ave., Cambridge, MA 02139-4307.** M.I.T. is an Equal Opportunity, Affirmative Action Employer. (For more information about the position and institution: http://www-math.mit.edu.)

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, DEPARTMENT OF MATHEMATICS – Two Year Postdoctoral Associate position - The MIT Math Department will be offering a two year Postdoctoral Associate position in the field of quantum information and quantum computing beginning September 2004 (or earlier). Theoretical quantum information science spans several departments at MIT. The post-doc would be expected to carry on independent research and to interact with the larger theoretical quantum information science program at MIT. Applicants should send: (a) C.V., (b) a brief statement of current and future research interests and (c) three letters of recommendation to: **Rhonda Culbert, MIT, Mathematics Department, Room 2-370, 77 Massachusetts Avenue, Cambridge, MA 02139-4307.** Completed applications should be received by February 16, 2004. MIT is an Equal Opportunity, Affirmative Action Employer.

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ADVERTISEMENTS

PURDUE UNIVERSITY – DEPARTMENT OF STATISTICS – Faculty Position(s) in Statistics - The Department of Statistics at Purdue University has one or more openings for faculty positions. Screening will begin December 1, 2003, and continue until the position(s) is (are) filled. Essential Duties: Conduct advanced research in statistical sciences, teach undergraduate and graduate students and maintain service in the Statistics Department. Essential Qualifications: Require Ph.D. in Statistics or related field, in hand or expected by August 16, 2004. Candidates must demonstrate potential excellence in research and teaching. Salary and benefits are competitive and commensurate with qualifications. Rank and salary are open. Candidate for assistant professor should send a letter of application, curriculum vita and three letters of reference. For senior positions, send a letter of application or nominations, curriculum vita, and the names of three references. Purdue University is an AA/EA/EO employer and educator. Send applications to: **Mary Ellen Bock, Head, Department of Statistics, Purdue University, 150 N. University Street, West Lafayette, IN 47907-2067, USA.**

SUNY CORTLAND – DEPARTMENT OF MATHEMATICS - The Mathematics Department at SUNY Cortland announces a tenure-track position at the assistant professor level, starting Fall 2004. Responsibilities include teaching undergraduate and master's level courses in mathematics, scholarly activity, college service, and occasional supervision of student teachers. Requirements: doctorate in mathematics or mathematics education completed prior to starting date, teaching experience, and a commitment to undergraduate education with emphasis on teacher preparation. ABD may be considered depending on expected completion date. Preference will be given to candidates with specialization in algebra, although other areas will be considered. Candidates should submit a letter of interest that includes a description of their philosophy of teaching, transcripts, and three letters of recommendation, at least one of which must address their ability and commitment as a teacher. Applications should be sent to **Search Committee Chair, Mathematics Department, SUNY College at Cortland, Cortland NY 13045.** Review of applications will begin on January 22, 2004 and continue until the position is filled. We plan to conduct interviews at the Joint Mathematics Meetings in Phoenix. SUNY Cortland is an AA/EEO/ADA Employer. We have a strong commitment to the affirmation of diversity and have interdisciplinary degree programs in the areas of Multicultural Studies.

UNIVERSITY OF TENNESSEE – DEPARTMENT OF MATHEMATICS - The University of Tennessee Department of Mathematics invites applications for the position of Head. A Ph.D. in Mathematical Sciences is required. The successful candidate should be qualified to be tenured at rank of full professor in the department. Evidence of a distinguished record of research and a commitment to teaching as well as administrative experience should be provided at the time of application. A commitment to supporting both pure and applied mathematics is expected. Strong leadership skills and the ability to work effectively with colleagues, staff, and students are especially important characteristics. Experience with curricular matters, notable activity in professional associations, and experience with generating external funding are highly desirable. The successful candidate will also have an understanding of and demonstrated commitment to equal employment opportunities and affirmative action. The Mathematics Department currently consists of 39 full-time faculty, 30 full and part-time lecturers and 60 full-time graduate students representing both pure and applied mathematics. The faculty has a strong commitment to graduate and undergraduate teaching, is associated with many interdisciplinary programs, and maintains close research relationships with the Oak Ridge National Laboratory. Applicants should submit a letter of application including current research interests and administrative philosophy, a curriculum vitae, and at least 3 letters of recommendation. Women and minorities are encouraged to apply. Address material to: **Chair, Math Head Search Committee, Department of Mathematics, 121 Ayres Hall, University of Tennessee, Knoxville TN 37996-1300.** Review of applications will begin February 1, 2004, and will continue until the position is filled. The University of Tennessee is an EEO/AA/Title VI/Title IX/Section 504/ADA/ADEA institution in the provision of its education and employment programs and services.

THE UNIVERSITY OF TEXAS AT AUSTIN - DEPARTMENT OF MATHEMATICS – R.H. Bing Faculty fellowship, VIGRE fellowship, Tenure/Tenure-track positions - Expected openings for Fall 2004 include: (a) Instructorships, some that have R.H. Bing Faculty Fellowships attached to them and others that are VIGRE Instructorships, and (b) four positions at the tenure-track/tenure level. (a) Instructorships at The University of Texas at Austin are postdoctoral appointments, renewable for two additional years. It is assumed that applicants for Instructorships will have completed all Ph.D. requirements by August 25, 2005. Other factors being equal, preference will be given to those whose doctorates were conferred in 2003 or 2004. Candidates should show superior research ability and have a strong commitment to teaching. Consideration will be given only to persons whose research interests have some overlap with those of the permanent faculty. Duties consist of teaching undergraduate or graduate courses and conducting independent research. The projected salary is $40,000 for the nine-month academic year. Each R.H. Bing Fellow holds an Instructorship in the Mathematics Department, with a teaching load of two courses in one semester and one course in the other. The combined Instructorship-Fellowship stipend for nine-months is $44,000, which is supplemented by a travel allowance of $1,000. Pending satisfactory performance of teaching duties, the Fellowship can be renewed for two additional years. Applicants must show outstanding promise in research. Bing Fellowship applicants will automatically be considered for other departmental openings at the postdoctoral level, so a separate application for such a position is unnecessary. VIGRE Instructorships are partially funded by an NSF VIGRE Grant awarded to the department (in partnership with the Texas Institute for Computational and Applied Mathematics). The combined Instructorship-VIGRE Postdoctoral Fellowship carries a nine-month stipend of $40,000, with an annual allocation of $2500 to cover equipment, supplies, and travel. The position also includes summer support in the amount of $6500 for the first two summers of the appointment. The teaching load for VIGRE Instructors is one course per semester. Only citizens, nationals and permanent residents of the U.S. are eligible for VIGRE Instructor appointments. Furthermore, a VIGRE Instructor must have received the Ph.D. within eighteen months of the date the appointment becomes effective. All eligible applicants for postdoctoral positions in either the Mathematics Department or TICAM will automatically be considered for a VIGRE Instructorship. Those wishing to apply for Instructor positions are asked to send a vita and a brief research summary to **Department of Mathematics, The University of Texas at Austin, Austin, Texas 78712 c/o Instructor Committee**. Transmission of the preceding items via e-mail (address: **instructor@math.utexas.edu**) is encouraged. (b) An applicant for a tenure-track or tenured position must present a record of exceptional achievement in her or his research area and must demonstrate a proficiency at teaching. In addition to the duties indicated above for Instructors, such an appointment will typically entail the supervision of M.A or Ph.D. students. The salary will be commensurate with the level at which the position is filled and the qualifications of the person who fills it. Those wishing to apply for tenure-track/tenure positions are asked to send a vita and a brief research summary to the above address, c/o Recruting Committee. Transmission of the preceding items via e-mail (address: **recruit@math.utexas.edu**) is encouraged. All applications must be supported by three or more letters of recommendation, at least one of which speaks to the applicant's teaching credentials. The screening of applications will begin on December 1, 2003. The University of Texas at Austin is an equal opportunity employer.

WILLIAMS COLLEGE – DEPARTMENT OF MATHEMATICS AND STATISTICS – Tenure-track position - The Williams College Department of Mathematics and Statistics invites applications for one tenure track position in statistics, beginning fall 2004, at the rank of assistant professor (in an exceptional case, a more advanced appointment may be considered). We are seeking a highly qualified candidate who has demonstrated excellence in teaching and research, and who will have a Ph.D. by the time of appointment. Williams College is a private, residential, highly selective liberal arts college with an undergraduate enrollment of approximately 2,000 students. The teaching load is two courses per 12-week semester and a winter term course every other January. In addition to excellence in teaching, an active and successful research program is expected. To apply, please send a vita and have three letters of recommendation on teaching and research sent to the **Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267**. Teaching and research statements are also welcome. Evaluations of applications will begin on or after November 24 and will continue until the position is filled. Williams College is dedicated to providing a welcoming intellectual environment for all of its faculty, staff and students; as an EEO/AA employer, Williams especially encourages applications from women and minorities. For more information on the Department of Mathematics and Statistics, visit http://www.williams.edu/Mathematics.

Association for Women in Mathematics

2003/2004 MEMBERSHIP FORM

AWM's membership year is from October 1st to September 30th.
Please fill-in this information and return it along with your DUES to:

AWM Membership
4114 Computer & Space Sciences Building
University of Maryland
College Park, MD 20742-2461

The AWM Newsletter is published six times a year and is part of your membership. Any questions, contact AWM at awm@math.umd.edu; (301) 405-7892 or refer to our website at: **http://www.awm-math.org**

LAST NAME **FIRST NAME** **M.I.**

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❑ I DO NOT wish for my AWM membership information to be released for the **Combined Membership List.**

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Date of Birth (optional): (MMDDYYYY) [the date of birth field is to strictly help prevent duplicate entries]

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If **student,** GRADUATE or UNDERGRADUATE (circle one)
If not employed, leave position & institution blank

Position:
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City, State, Zip:

DEGREES EARNED:

	Degree(s)	Institution(s)	Year(s)
Doctorate:			
Master's:			
Bachelor's:			

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INDIVIDUAL DUES SCHEDULE

Please check the appropriate membership category below. Make checks or money order payable to: **Association for Women in Mathematics**.
NOTE: All checks must be drawn on U.S. Banks and be in U.S. Funds. AWM Membership year is **October 1st to September 30th.**

For NEW Individual members: JOIN at the reduced rate of $30.00 for the 03/04 membership year [valid thru 6/30/04]

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CONTRIBUTING MEMBERSHIP.....	$100	
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STUDENT or UNEMPLOYED MEMBERSHIP (circle one).....	$ 15	
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All payments must be in U.S. Funds using cash, U.S. Postal orders, or checks drawn on U.S. Banks.		
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❑ I am also enclosing a DONATION to the **"AWM ANNIVERSARY ENDOWMENT FUND"**.....	$	

Indicate if you wish for your **contribution(s)/donation(s)** to remain **ANONYMOUS** ⇨ ❑
Dues in excess of $15 and all cash contributions/donations are deductible from federal taxable income.

INSTITUTIONAL DUES SCHEDULE

❑ CATEGORY **1** (includes 10 student memberships; 1 free ad; 25% off additional Newsletter & online ads∗)..	$250	
❑ CATEGORY **2A** (includes 3 student memberships; 1 free ad; 10% off additional Newsletter & online ads∗)....	$125	
❑ CATEGORY **2B** (includes 6 student memberships; 10% off Newsletter & online ads∗).....	$125	

ADVERTISING: Institutional members on Categories 1 and 2a receive ONE FREE job link ad **or** ONE FREE Newsletter ad (up to 4 lines) for the membership year Oct. 1st to Sept. 30th. All institutional members receive discounts on other eligible∗ advertisements (25% off for Category 1 and 10% off for Categories 2a and 2b). ∗Eligible advertisements: The institutional discount applies to both classified and job link online ads as well as classified *Newsletter* ads, but it does not apply to *Newsletter* display ads. If institutional dues have not been received by the invoice date, the full advertising rate will be charged. *Newsletter* advertising deadlines are the 1st of every EVEN month. All institutions advertising are Affirmative Action/Equal Opportunity Employers. **STUDENT NOMINEES**: Institutions have the option to nominate students to receive the newsletter as part of their membership. List names and addresses of student nominees on opposite side or attach a separate page. [ADD $15 ($23 for foreign members) to the listed institutional rate for each student add-on over the initial 10 students for Category 1; over the initial 3 students for Category 2a & over the initial 6 students for Category 2b]. For more advertising/membership info see **www.awm-math.org**

❑ Indicate if **GIFT membership FROM:** **TOTAL ENCLOSED $**

Volume 34, Number 1, January–February 2004

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Database Corrections
AWM
4114 Computer & Space Sciences Bldg., University of Maryland, College Park
Maryland 20742-2461

or E-MAIL:

awm@math.umd.edu

☐ I DO NOT wish for my AWM membership information to be released for the **Combined Membership List (CML).**

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