

AWM

ASSOCIATION
FOR WOMEN IN
MATHEMATICS

Volume 36, Number 1

NEWSLETTER

January–February 2006

President's Report

The Year in Review

With this report, I am completing my first year as President of AWM, and mid-way through the course seems like a good point to pause and review what AWM has been doing for the past year. Perhaps a good subtitle for this column would be, "The education of a president," because, above all, I have learned much.

In this column, I have written at length about the process whereby AWM contracted with an association management company, STAT Marketing, Inc. After eight months of working with the new arrangement, I am happy to report that our fears that we would be dealing with an anonymous "McManagement" are completely unfounded. There have been a few changes of personnel—one maternity leave, one staff member who decided she prefers a pet business to a people business—and, as I write this, we are concerned about Jerry Galler, CFO of STAT, who is recovering from bypass surgery. In short, they've become like family. And although I never had the pleasure of working with Dawn Wheeler, and though we anticipated the change with trepidation, Dawn's perfectionist habits stood AWM in good stead. We have been able to close the office at the University of Maryland, with many thanks to our long-time hosts there, and many fond memories of the help they gave AWM when we were homeless and struggling.

By the time this *Newsletter* is in circulation, many of you will have met Jennifer Lewis, AWM's new Managing Director, for the first time at the Joint Mathematics Meetings. And you may also have met Jenny Quinn, the Executive Director AWM has hired to work with the volunteers. This second staff change is almost more of a departure from our old way of doing business than was the transition to STAT, as it is many years since AWM has had an Executive Director. Also, our arrangement is perhaps unusual, as in most organizations, the Executive Director also functions as a chief of staff, whereas that is not the case for us. In fact, Jenny is working for us part-time—this is based in part on our financial situation which will not allow more staff at the moment.

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AWM
 ASSOCIATION
 FOR WOMEN IN
 MATHEMATICS

The purpose of the Association for Women in Mathematics is

- to encourage women and girls to study and to have active careers in the mathematical sciences, and
- to promote equal opportunity and the equal treatment of women and girls in the mathematical sciences.

AWM was founded in 1971 at the Joint Meetings in Atlantic City.

The *Newsletter* is published bi-monthly. Articles, letters to the editor, and announcements are welcome.

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EXECUTIVE COMMITTEE

President

Barbara Lee Keyfitz
 Fields Institute
 222 College Street, 2nd Floor
 Toronto, Ontario
 M5T 3J1 Canada
 bkeyfitz@fields.utoronto.ca

Past President

Carolyn Gordon

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 Krystyna Kuperberg
 Helen Moore
 Catherine A. Roberts
 Ann Trenk

Clerk

Maura Mast

Meetings Coordinator

Bettye Anne Case; case@math.fsu.edu

Newsletter Editor

Anne Leggett; leggett@members.ams.org

Web Editor

Holly Gaff; hgaff@epi.umaryland.edu

The other headquarters change that we hope every member will have noticed is the new membership database which was rolled out in October, just in time for our new membership year. We are aware that there may be a few bugs in it, and urge you to call them to our attention—patiently, but if necessary, insistently. Along with online renewals, we now have—thanks to a change in the AWM bylaws—online voting. And, as you will have noticed, an increase in the number of elected members-at-large of the Executive Committee, from a total of five to a total of eight. This change will be phased in over two election cycles. It is our hope that the easier voting system will lead to greater participation in voting by members.

The change in bylaws is part of the Strategic Plan that AWM adopted in June 2004 as part of an intense reexamination of all aspects of the Association that was begun by then-President Carolyn Gordon. Motivation came from a widely shared sense that AWM is maturing as an organization, that it may be time to focus our efforts on the needs of a new generation of women mathematicians, and that the best way to ensure that our traditions live on is to engage a perennially renewed group of members in our activities. The Plan is designed to be implemented

One thing that amazes anyone getting to know AWM (such as our management company!) is the number of different programs we run.

over a period of three years, with periodic updates. Under the guidance of the Strategic Plan, we are forming a series of Task Forces that will concentrate on each facet of our operation. The first, the Infrastructure Task Force, was the group that looked at the composition of the Executive Committee, formulated the bylaws changes, and then expended considerable effort in finding a workable solution to the headquarters reorganization. I would like to thank the other members of that group (Carolyn Gordon, Fern Hunt, Anne Leggett, Catherine Roberts, Ann Trenk and Carol Wood) for their contribution of conscientious thought and hard work. Besides the new staffing solutions, the committee has formulated a division of responsibilities for members-at-large that will be presented to the EC in January, 2006.

The next steps which we hope to begin taking in the near year involve a study of our programs and much overdue attention to the needs of our members, to expanding membership, and to financial development.

One thing that amazes anyone getting to know AWM (such as our management company!) is the number of different programs we run. Here are some things that are new in some of them.

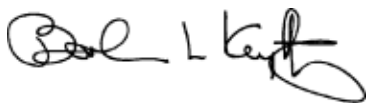
The Education Committee has started a “Teachers’ Partnership,” along the lines of the AWM Mentoring Network run by Rachel Kuske. Information will be appearing on our web page soon.

The AWM Travel Grants program has been renewed at a higher level and with a new component: there will now be money for travel to

mathematics education conferences and for researchers in mathematics education. Don't forget to look at deadlines on our web page. The popular mentoring travel grants program will continue, and we plan to offer more Ruth Michler collaborative grants. One feature of the NSF-funded travel grant program is an evaluation, carried out confidentially by an independent evaluator. Some of the comments by participants are very gratifying.

The Canadian "Committee on Women," a committee of the Canadian Mathematical Society, has been campaigning for meeting opportunities. They have a small informal gathering and a committee meeting at the national meeting of the CMS and last summer ran a short workshop on "Connecting Women in Mathematics Across Canada," about which I reported in an earlier column. Now we have just learned that a five-day-long workshop at Banff has been approved for next September. Like all BIRS workshops, this will be international. In fact, as BIRS is now a partnership including Canada, the US and Mexico, we are expecting Mexican participation as well. The exact structure of the meeting is still under discussion as I write this, but the usual scope of a BIRS workshop is about 40 participants, and we hope to be able to select a number of applicants.

As I am discovering, AWM has so many activities that by the end of this column, I have not covered half of them. Watch for news of SK High School Days, the Essay Contest, the AWM Student Chapters program and more in a future column.



Barbara L. Keyfitz
Toronto, Canada
November 27, 2005



MEMBERSHIP AND NEWSLETTER INFORMATION

Membership dues (Membership runs from Oct. 1 to Sept. 30)

Individual: \$55	Family (no newsletter): \$30
Contributing: \$125	First year, retired, part-time: \$30
Student, unemployed, developing nations: \$20	
Friend: \$1000	Benefactor: \$2500

All foreign memberships: \$10 additional for postage
Dues in excess of \$15 and all contributions are deductible from federal taxable income.

Institutional Members:

Level 1: \$300
Level 2a or 2b: \$175/\$150
See 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 \$55/year (\$65 foreign). Back orders are \$10/issue plus shipping/handling (\$5 minimum).

Payment

Payment is by check (drawn on a bank with a US branch), US money order, or international postal order. Visa and MasterCard are also accepted.

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 Managing Director, in consultation with the President and the Newsletter Editor when necessary, will determine whether a proposed ad is acceptable under these guidelines. *All institutions and programs advertising in the Newsletter must be Affirmative Action/Equal Opportunity designated.* Institutional members 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 \$12 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 Department, Loyola University, 6525 N. Sheridan Road, Chicago, IL 60626; e-mail: leggett@members.ams.org; phone: 773-508-3554; fax: 773-508-2123. Send all **book review** material to Marge Bayer, Math Department, University of Kansas, 405 Snow Hall, 1460 Jayhawk Boulevard, Lawrence, KS 66045-7523; e-mail: bayer@math.ku.edu; fax: 785-864-5255 and all **education column** material to Ginger Warfield, Math Department, University of Washington, Seattle, WA 98195; e-mail: warfield@math.washington.edu. Send everything else, **including ads and address changes**, to AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030; phone: 703-934-0163; fax: 703-359-7562; e-mail: awm@awm-math.org.

AWM Executive Director

Jennifer Quinn
 phone: 253-879-3630
 jquinn@awm-math.org

AWM ONLINE**AWM Web Editor**

Holly Gaff
 hgaff@epi.umd.edu

Online Ads Info

Classified and job link ads may be placed at the AWM website.

Website and Online Forums

<http://www.awm-math.org>

AWM-NET

Editor: Dianne O'Leary
 oleary@cs.umd.edu

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

AWM DEADLINES

NSF-AWM Travel Grant:
 February 1, 2006 and May 1, 2006

NSF-AWM Mentoring Travel Grant:
 February 1, 2006

Ruth Michler Collaborative Travel Grant:
 February 1, 2006

AWM-SIAM Workshop: January 26, 2006

Sonia Kovalevsky High School
 Mathematics Days: February 4, 2006

AWM/MSRI Workshop
 Funding: March 1, 2006
 Registration: April 1, 2006

AWM OFFICE

Jennifer Lewis, Managing Director
 DeeJay Garringo, Membership Director
 11240 Waples Mill Road, Suite 200
 Fairfax, VA 22030
 phone: 703-934-0163
 fax: 703-359-7562
 awm@awm-math.org

ICM-2006, Madrid, August 22–30

Betty Anne Case, AWM Meetings Coordinator

A link from the index page for the upcoming International Congress of Mathematicians, http://www.icm2006.org/paginas/?pagina=home_ing, leads to good news for those who have enjoyed activities with or about women at previous ICMs, and for other attendees interested in the working life of mathematicians around the world (click on Other activities).

Women in Mathematics

Following the tradition at each ICM since 1974, a group of women is organizing special activities. There will be a panel discussion about women working in mathematics, and other events. With other women from around the world, members of the European Women in Mathematics (EWM) and the Association for Women in Mathematics (AWM) are participating in this planning; information will be available on their websites as planning proceeds.

<http://www.awm-math.org>
<http://www.math.helsinki.fi/EWM/>

Other offerings will include the documentary film, "The Madrid Interviews," made in 1996 under EWM auspices; it may be possible to arrange a photograph exhibition.

At least 14 invited lecturers have been identified as women. Several of them will participate on the panel discussion, including Michelle Vergne, a member of the group planning these activities and the only woman who is a plenary lecturer. The panel discussion will likely be Friday, August 25, and all the activities of this section will be in the late afternoons after scientific sessions (but before the European dinner hour).

The very welcome IMU decision to take over sponsorship of the Emmy Noether Lecture at the ICM for the first time has resulted in the announcement by their distinguished search committee that Yvonne Choquet-Bruhat will give this major lecture. This is the fourth in this ICM series of talks by distinguished women.

Will You Attend ICM-2006?

If you have tentative or definite plans to attend, we'll keep you up-to-date on activities being planned by a group of 25 women from around the world. We expect to get a listserv set up early next year to expand participation beyond that preliminary organization group; please send your comments and best e-mail address to case2@math.fsu.edu.

MathFest 2005

Thanks to Amy Cohen and Jenny Quinn for some of the information and prose.

The first AWM-MAA Falconer Lecture, “Techniques for Visualizing Frequency Patterns in DNA,” was given by Fern Hunt, National Institute of Standards and Technology (NIST). The abstract read: “Many biological properties of a DNA sequence can be deduced from the frequencies of its constituent nucleic acids A, C, G, T and the subsequences they form. We will discuss some statistical properties of DNA that are amenable to visual and graphic display. Two examples among others to be presented are a visual representation of rare or avoided subsequences and an extension of Chargaff’s rule.”

The Etta Z. Falconer Lectures honor women who have made distinguished contributions to the mathematical sciences or mathematics education. While this series of one-hour expository lectures began with MathFest 1996, the title “Etta Z. Falconer Lecture” was established in 2004 in memory of Falconer’s profound vision and accomplishments in enhancing the movement of minorities and women into scientific careers.

We’re delighted that Fern kicked off the newly named series with such a fantastic lecture. The many slides certainly proved the adage about pictures being worth many words.

Our AWM Essay Contest Winner in 2002 at the college level, Alicia Richardson (Morgan State University, Baltimore) had this to say about Hunt’s work related to DNA:

Currently, Dr. Hunt is doing work in bioinformatics. This is a relatively new area of computational biology used for finding out information about genes. The Human Genome Sequence Project is an attempt to determine exactly the correct sequence of all of the human DNA sequences. These are made up of amino acids A (Adenine), C (Cytosine), T (Thymine), and G (Guanine). She also pointed out during the interview that “people feel that once they know what the genes are in DNA, that would give them a big step in understanding and curing disease(s).” For example, during our discussion I learned that it might be possible to cure sickle cell anemia by correcting the gene that causes the red blood cell to sickle. Dr. Hunt and other scientists have developed a method of using sequence statistics to build



Fern Hunt (NIST), Falconer Lecturer, with Amy Cohen (Rutgers University), who introduced her

a Markov decision model that is being used to solve a particular linear programming problem related to the alignment of sequences of DNA.

In case you’ve forgotten Chargaff’s rule (I recognized the rule when I saw it, but no longer knew it by name, if I ever did!), it’s the one that says A and T appear in equal amounts in DNA, as do C and G. The Watson-Cricks-Franklin double helix model explained these pairings.

See the MAA MathFest Awards section later in this issue to read about several prizes awarded to AWM members and others. These include Judith Grabiner’s Lester R. Ford Award, Maureen T. Carroll and Steven T. Dougherty’s Merten M. Hasse Prize, and Sarah Greenwald’s and Laura Taalman’s Alder Awards.

Annalisa Crannell, Franklin and Marshall College, was everywhere. She participated in Project NExT panels, emceed the opening banquet, and portrayed world famous actress Annalisa Monalisa Cranberry in “Lights, Camera, Freeze,” a discussion of perspective.

Friday evening we were treated to a command performance of “Count Her In!” a play about women in mathematics by Sherry Lowell-Lewis. Set in a present day drama class, the players presented and in turn transformed into their mathematical heroines. Using a PowerPoint presentation for scenery and minimal props and costumes, the play does a remarkable job of showing us the students’ viewpoint on Hypatia, Sofia Kovalevskaya, Winifred Edgerton Merrill, Emmy Noether, Paris Pismis, Sarah Flannery, and Emilie du Chatelet. The initial inspiration for the play is due to Joanne Peeples, El Paso Community College, and Hamide

Dougan, University of Texas, El Paso. But “Count Her In!” was developed collaboratively by seven high school students, three undergraduate women, three women graduate students, one playwright, and the two professors with funding from an MAA Tensor Grant. Though the audience was frozen by overactive air conditioning, the performance warmed our hearts and strengthened our belief that women and mathematics make a powerful combination.

The AWM reception was, as usual, well-attended. All of the food was demolished except for one tray of brownies, which seems very strange to your chocaholic editor.

An MAA invited address was given by Ruth Haas, Smith College. The abstract for “Graphs, Trees, Pebbles, and Robots” was: “The arboricity of a graph is the minimum number of spanning forests into which its edges can be partitioned. We discuss several old and new characterizations of this number and its variants, including a new method for finding this number through ‘pebbling’ the graph. This work has application to determining if a graph is rigid and if not, what motions it allows. This in turn can be used to understand the motions of robots.”

The MAA-NAM David Blackwell Lecture, “Modeling the Pharmacokinetics of a Chemical Used in Household Consumer Products,” was given by Leona H. Clark, Bennett College for Women. The abstract: “Perfluorooctane sulfonate (PFOS), a member of a class of perfluorinated chemicals used in a variety of consumer products as oil, water, and grease repellants, has been shown to be toxic in laboratory animals. Because PFOS has been shown to be persistent and widely distributed in the

environment and has been detected in the blood of fluorochemical workers and non-occupationally exposed humans, there have been growing concerns about its potential health risk to humans. The mathematical model to be presented describes the pharmacokinetics (absorption, distribution, metabolism, and elimination) of PFOS following oral exposure and provides a framework for dose-response analyses needed to help assess the risk that exposure to PFOS might have on human health and the environment.”

William Yslas Vélez, University of Arizona, delivered the James R.C. Leitzel Lecture, “Increasing the Number of Mathematics Majors: Lessons Learned from Working with the Minority Community.” His abstract read: “In the late 1980s I began to increase the number of minorities surviving our first semester calculus course. My goal was very modest—help them pass this course. As I worked with these students my own ideas about the importance of calculus began to change. We all know that this course is the gateway to all scientific disciplines, but it is much more than this. It gives mathematicians the opportunity to entice students into the study of mathematics. Calculus should not be thought of as a service course for the university, it should be viewed as serving the intellectual needs of the student. My efforts to increase minority participation now focus on helping students understand the importance of including more mathematics in their undergraduate curriculum. When I talk to students in calculus, I try to convince them to take more mathematics, and to become mathematics majors. This has resulted in a substantial increase in the number of minority mathematics majors in the department.”

Call for Nominations: 2007 Louise Hay Award

The Executive Committee of the Association for Women in Mathematics has established the Louise Hay Award for Contributions to Mathematics Education, to be awarded annually to a woman at the Joint Prize Session at the Joint Mathematics Meetings in January. The purpose of this award is to recognize outstanding achievements in any area of mathematics education, to be interpreted in the broadest possible sense. The annual presentation of this award is intended to highlight the importance of mathematics education and to evoke the memory of all that Hay exemplified as a teacher, scholar, administrator, and human being.

The nomination documents should include: a one to three page letter of nomination highlighting the exceptional contributions of the candidate to be recognized, a curriculum vitae of the candidate not to exceed three pages, and three letters supporting the nomination. It is strongly recommended that the letters represent a range of constituents affected by the nominee’s work. *Five* complete copies of nomination materials for this award should be sent to: The Hay Award Selection Committee, Association for Women in Mathematics, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. Nominations must be received by **April 30, 2006** and will be kept active for three years. For more information, phone (703) 934-0613, e-mail awm@math.umd.edu or visit www.awm-math.org. Nominations via e-mail or fax will not be accepted.

Book Review

Book Review Editor: Margaret Bayer, University of Kansas, Lawrence, KS 66045, bayer@math.ku.edu

The Woman's Guide to Navigating the Ph.D. in Engineering & Science, Barbara B. Lazarus, Lisa M. Ritter, and Susan A. Ambrose, IEEE Press, New York, 2001, ISBN 0-7803-6037-0

Reviewer: Leigh Shaw McCue, Aerospace and Ocean Engineering, Virginia Tech, mccue@vt.edu

While this book lies firmly in the must-read category for female graduate students, its title can be deceiving. In fact, it makes quite an effective guide for male graduate students (particularly those with families), minorities, all types of non-traditional students, and faculty. The book logically outlines the chronology of graduate life including choosing a Ph.D. program, selecting an advisor, seeking funding, addressing the emotional issues that can arise from the unique rigors of graduate study, and finding a job upon graduation. Throughout discussion of these phases of graduate life, challenges specific to women are identified and treated in some depth, typically followed by suggested approaches to overcome such difficulties. In many ways this guide is just as useful to faculty advisors who may (a) have come from a very different graduate experience and thus not fully understand the challenges some women, minorities, and those with families experience in graduate school, (b) have forgotten these experiences, or (c) have never reflected upon these experiences in detail. I first read this book as a relatively senior graduate student. At the time I found it useful, though I lamented not having been introduced to it sooner. In re-reading it now for the composition of this review, I was amazed by how accurately it captures the day-to-day experiences of the graduate student as well as the faculty member.

One need not look beyond the preface to find the striking statistics and history of women in science and engineering. The statistics as given in the book listed 1177 total Ph.D.'s awarded in mathematics in 1998, of which 297 were earned by women. Number theory, with 7 of 46 total Ph.D.'s, was the mathematical field statistically least represented by women.¹ The preface then discusses the historical and soci-

etal context leading to the disparity in these numbers and how our culture leads to an inherent bias for men in science and engineering. Using the data of the preface as a launching point, the first chapter overviews graduate school, typical procedures and requirements, then focuses on the demands inherent in graduate study with emphasis on specific challenges for women. In a brief but poignant section titled "why some women find doctoral work more than demanding," the authors discuss "invisible barriers" within academia. These barriers can be as subtle as feelings of isolation and unconscious stereotyping, as unintentional as women not having access to the same information and contacts as men, or as challenging as work-life constraints or non-comparable financial support between male and female students (though the authors write that many colleges and universities have revised and improved their funding policies). Specifically, Lazarus, Ritter, and Ambrose note that a combination of these factors can ultimately result in the loss of female students: "For many women, financial burdens coupled with an absence of female colleagues and mentors can make the entire experience too difficult and too costly at a personal level. In the long term, inequities can erode the personal strength and self-confidence of female graduate students and can cause them to lose faith in the system." [p.5] The chapter concludes with suggestions for success, a pervasive theme of the book useful to men and women, with quotes from graduate students, faculty, and administrators laced throughout the pages.

The second chapter provides manual-like detail of the Ph.D. process, beginning with finding and interacting with an advisor and committee, requirements, funding, qualifying exams, and writing the dissertation. As with the rest of this book, many suggestions are uniform for all students, regardless of gender or race—such as tips for putting together a support structure of mentors, how to be a good mentee, and remedying imperfect advising arrangements, preparing for qualifying exams (and what to do if you do not pass), choosing a committee and thesis topic, and overcoming writer's block. This chapter identifies the problem of a lack of uniform requirements for doctoral students. While in many departments a lack of written requirements is intended to allow

¹For updated statistics one may reference the Women in Engineering Programs and Advocates Network, www.wepan.org. Membership is required for data access.

for greater flexibility for students, the authors determine that poorly established written requirements, unwritten requirements and a lack of familiarity with department requirements can adversely affect graduate students, particularly by women. Additionally, when requirements are passed down by word of mouth, women in male-dominated fields may not be privy to such information and may be hesitant to solicit necessary information. To assist students, the book lists topics for which there are usually (or should be) standardized policies, items such as requirements for degree attainment, financial support, support services for the student, outside employment, attending conferences and seminars, and other services such as health insurance, international student services, teaching support, professional development, and child care. This section on the lack of uniform policies struck me as a topic for which faculty members and administrators

have a very real opportunity to affect change to benefit all students. The breakdown of policies listed by the authors would serve as an excellent outline for a department looking to formalize their requirements for Ph.D. students.

Also of tremendous relevance to those traveling the graduate student path, is the authors' aptly titled third chapter on "potential storms" one may encounter along the way. The storms are divided into four primary groupings of self-esteem, loneliness, learning by critique, and balance. This chapter focused on many of the more internal and/or psychological considerations of graduate study and how these issues apply specifically to female graduate students. Suggestions are made toward establishing the necessary support system as well as ways to self-validate one's worth to help alleviate self-esteem problems, "imposter" syndrome, or feelings of isolation even when the student finds herself a gender minority in her

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 \$5000 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 1 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) the AWM Mentoring Travel Grant Form; 2) a cover letter (if a prior AWM-NSF mentor grant has been awarded, indicate so); 3) a curriculum vita; 4) a research proposal, approximately five pages in length, which specifies why the proposed travel would be particularly beneficial; 5) 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; 6) a proposed budget; and 7) 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, AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications via e-mail or fax will not be accepted. The deadline for receipt of applications is **February 1, 2006**.

department. Additionally, graduate school presents an entirely new way of learning for students, that is, through critique, which the authors state many women internalize differently than men. At the same time, the book notes that this perception that women may react emotionally to criticism could result in a well-meaning advisor not giving a female student the feedback she needs. The book explains that the motivation behind critique in academia is to push students to be independent thinkers and further develop their ideas. Ways in which women, who may be uncomfortable initially with this form of learning, can acclimate and prepare themselves are suggested. The chapter's wonderfully titled section "Learning how *not* to be a 'nice' girl," cites research and experience on how women can learn to assert themselves in an appropriate manner to be competitive with their male counterparts. The chapter concludes with strategies for balancing work and life, and specifically discusses the pressures women may be subject to in maintaining relationships and/or a household.

The final chapter focuses upon the job hunt in a manner applicable to both men and women. The chapter gives suggestions for finding a job, be it in industry or academia, interviewing (including what you should ask ... and what they should not). The authors also address the important question of whether or not working as a post-doc prior to seeking more permanent employment is best. Specific tips for foreign students are given. Then, just as the preface opened with the history of women in academia and statistics on women in Ph.D. programs, the last chapter ends with a discussion of the general workplace environment for female scientists, along with statistics broken down by occupation, gender, highest degree, and numbers of scientists

and engineers in the workplace. This chapter also contains a brief section on mentoring others, which is worthwhile reading for women who have completed their graduate careers and are in the working world now.

Frankly, my only criticism of this book is in their web resources section. Located between their bibliography of approximately 100 references related to women in science and engineering and the index, the authors collect a list describing organizational and other useful websites, not limited to women's organizations, but including, amongst others, AWC, AWIS, IEEE, MentorNet, NSF, NSBE, SWE, WEPAN, etc. ... yet there is no mention of AWM (along with a couple other organizations that come to mind, such as ASEE and SHPE).

The Woman's Guide to Navigating the Ph.D. in Engineering & Science is wonderfully put together with a nautical journey motif (particularly appealing to this Ocean Engineering faculty member) and snippets of commentary, self-reflection, and hard earned wisdom from females in all walks of academia. The lessons learned are of benefit to women and men,² with gender specific issues and solutions highlighted throughout the work. For faculty, the book offers a reminder of graduate life and allows for reflection as to how we can serve as better mentors and advisors to those embarking on this path.

² Ironically, my male Ph.D. student has been stealing glances at my copy of this book, as if he worried it contained some form of inside information I intended to share only with my female Ph.D. student. He has specifically asked to borrow it as soon as I finish writing this review, a request I will of course happily oblige.

2006 MAA TENSOR Grants

The MAA plans to award grants for projects designed to encourage college and university women or high school and middle school girls to study mathematics. The Tensor Foundation, working through the MAA, is soliciting college, university, and secondary mathematics faculty (in conjunction with college or university faculty) and their departments and institutions to submit proposals. Grants will be made for up to \$5000. Proposals will be due in early February, 2006. Possible projects include organizing clubs for women interested in mathematics or mathematics and science, providing release time for faculty to prepare courses on women and mathematics, and conducting summer mathematics programs for high school women. For more details, see www.maa.org/projects/tensor_solic.html.

Education Column

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

This month I am reprinting (with the kind permission of the editors) a book review I wrote for the *MAA Monthly* 112 (November 2005, pp. 850–851). I enjoyed reading the book so much that I wanted to share the fun.

Some books inform and some books entertain. Steve Olson's *Count Down* falls delightfully into the intersection of those two sets. Reading it feels rather like taking part in a dinner table conversation with a charming and articulate fellow guest. The subtitle of the book is *Six Kids Vie for Glory at the World's Toughest Math Competition*, and correspondingly each of the central chapters is about one of the six members of the US team for the Forty-Second Math Olympiad, and his approach to one of the Olympiad's six problems. What

makes the book such good reading, though, is not just the kids, though they are fascinating individuals, nor their solutions to the problems, though they are lovely mathematics, but the way that Olson uses both as springboards into six different very live and pertinent issues. As each chapter begins, you can almost see Olson push back his chair, twirl the stem of his wine glass (a few decades ago I would have said "light his pipe!") and say "Did I ever tell you about young David Shin?" Or it might be "Have you ever thought about the issue of mathematical talent?" And you lean on your elbows, occasionally wanting to say "Hear, hear!" and occasionally "But wait a minute...!" but never to tune out.

To give one specific example, I will walk us through Chapter 3, entitled "Insight." In the first paragraph we meet Tiankai Liu and a particular Olympiad problem: *In an acute triangle ABC with circumcenter O and altitude AP, angle C is greater than or equal to angle B plus 30 degrees. Prove that angle A plus angle COP is less than 90 degrees.* After a brief excursion into Greeks and their geometry, we return to Tiankai, beginning to work out the solution. Then we widen our focus from Tiankai with his pencil in hand to Tiankai in general. It

turns out that he is by far the youngest member of the team, which leads naturally into a discussion of mathematical precocity, and the general issue of age and mathematical ability. After a small digression to debunk the theory that only young mathematicians do high quality work, we return to considering what might be some of the advantages that precocious kids have. Olson suggests that precocity might correlate with ability to visualize, which leads into a considerable discussion of people who learn mathematics verbally as contrasted with those who learn it visually. He concludes that visualizing comes more easily for some folks, but that anyone's abilities can and should be increased. By way of what I found a really telling example, he points out that children who learn purely verbally are much distressed

(and often irreversibly confused) by the fact that $1/8$ is less than $1/4$. Since they know that eight is greater than four, it just seems like dirty work at the crossroads. On the other hand, children with a really firm connection to the inevitable pizza have an instant mental image of two $1/8$ size slices fitting over one $1/4$ size one, and with that knowledge a solid foundation

on which to build an understanding of fractions. Current trends in mathematics education are acknowledging the need for such a foundation.

Olson returns us from this exploration with a quotation pointing out that "truly gifted mathematicians are the ones who are good at both spatial and analytical reasoning," which leads us smoothly back to the unambiguously gifted Tiankai. The next couple of pages describe Tiankai's thought processes and ultimately the proof he produces (including a metaphorical description of proof by contradiction that is one of Olson's few mathematical inaccuracies.) The penultimate paragraph briefly introduces Paul Erdős's notion of proofs that belong in the Book—a celestial tome comprising the best and most elegant proofs in the entire field of mathematics. And then, to leave things very firmly focused on the very real person of the problem-solver himself and on his insight, Olson finishes his chapter:

And it is the very elegance of Tiankai's proof that raises the final, and perhaps unanswerable, question. How did he manage to develop what might be the Book

Olsen [includes] a quotation pointing out that "Truly gifted mathematicians are the ones who are good at both spatial and analytical reasoning."

proof in just forty-five minutes? How did he know so swiftly and so surely which angles to draw, which points to add, which lines to compare? He can't explain. When you ask him, he shrugs his shoulders and turns away.

The other attributes Olson considers are competitiveness, talent, creativity, breadth and a sense of wonder. I was grateful to note that he admits that competition is a thorny issue. My skepticism on the subject nearly put me off of reading the book altogether, and a casual treatment of it would have been distinctly detrimental to my consideration of his other ideas. He brings up the arguments in favor of it and against it, and then staunchly refuses to debunk either set—a very well chosen tactic.

At intervals throughout the book we are reminded that we are talking about a very specific Math Olympiad, and drawn into the goings-on that accompany the Olympiad's mathematical events. We see how individuals relax, what the team's favorite recreations are, how the different nations' teams interact. And we see building up before our eyes the stress level produced by the question of which teams are going to be the winners. In the final chapter, despite all the philosophical excursions, Olson manages to zero in on the scoring of the problems in such a way as to build up quite an effective degree of suspense. Far be it from me to undermine that by giving more details!

Sonia Kovalevsky High School Mathematics Days

Through grants from Elizabeth City State University (ECSU) 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 2006 for Spring 2006 using funds remaining after the August 2005 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.

Applications, not to exceed six pages, should include: a) a cover letter including the proposed date of the SK Day, expected number of attendees (with ethnic background, if known), grade level the program is aimed toward (e.g., 9th and 10th grade only), total amount requested, and organizer(s) contact information; b) plans for activities, including specific speakers to the extent known; c) qualifications of the person(s) to be in charge; d) plans for recruitment, including the securing of diversity among participants; e) 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.); f) local resources in support of the project, if any; and g) 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 2006. 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 or by June 1, 2006, whichever comes first. Reimbursements will be made in one disbursement; no funds will 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, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications must be received by **February 4, 2006**; applications via e-mail or fax will not be accepted.

Confidence Gained from Middle School Girls Mathematics Clubs

Jerry Dwyer, Texas Tech University

Middle School Girls and Mathematics

Historically, girls have been viewed as less likely to enjoy mathematics and the sciences and to succeed in those areas. Research has demonstrated that this is not due to a lack of ability. In fact, until middle school, girls score as well as their male classmates in mathematics. At that age, though, girls seem to fall prey to “sex-role stereotypes in family, school, and society.” [Yusuf, 1995, p. 187] Studies by the American Association of University Women (AAUW) found pressures on adolescent girls that often result in dramatic and long-lasting losses of self-esteem. [AAUW, 1991] This loss of self-esteem may be related to the significant drop in confidence in mathematical ability for girls aged thirteen to fifteen. [Sherman, 1980] An unfortunate consequence is that girls then choose to take fewer advanced mathematics courses. [Meece and Parsons, 1982]

Thus, the idea arose to organize middle-school mathematics clubs for girls, aimed to capture their interest in mathematics at a time when they may be most vulnerable to negative feelings toward the subject. The philosophy was that giving girls a safe environment in which to experiment with mathematical ideas and enjoy success with them would lead to the development of more positive attitudes toward mathematics and a greater likelihood of taking more advanced mathematics courses in the future.

A Middle School Mathematics Club

Having received funding from the Mathematics Association of America TENSOR grant program, Jerry Dwyer, an outreach mathematician at The University of Tennessee, set

out to create interactive clubs for middle school girls. [Dwyer, 2000] Three area middle schools agreed to host the clubs, each providing a mathematics teacher as a club sponsor. The university provided a female club leader (role model) for each school, selecting leaders from among its mathematics graduate and undergraduate students. Two faculty mentors from the university provided resources for activities and coordinated the activities of the clubs. Clubs met once a week after school for about an hour. Frequently pizza or other snacks were provided as the girls worked on mathematics problems or engaged in problem-solving activities. Two large projects, designing T-shirts and creating Rube Goldberg machines, were used at all three schools.

Assessment

Feedback from participants suggests that students gained increased confidence in their abilities. Hands-on projects give the girls the confidence to know that they can apply their knowledge and work in areas traditionally reserved for boys.

They enjoyed working together and developing their ability to help one another. However, the girls did not typically think of mathematics as a creative endeavor, and they did not think of their mathematics classes or mathematics careers as interesting. From this feedback, some suggestions for the future include more emphasis on mathematically-related career options, use of activities that allow all students to succeed in mathematics, and some very challenging activities to encourage strong mathematics students to stay with the program.

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Conclusions

Dr. Dwyer moved to Texas Tech University in 2003 and obtained further MAA/Tensor support to develop math clubs in Lubbock, Texas, and at the time of writing six clubs were in operation there. The mathematics clubs were viewed as successes in all schools, and teachers and administrators from other schools inquired about starting their own similar clubs. The clubs provide an enjoyable and safe environment in which students can experiment with mathematics. Students may

develop more positive attitudes toward mathematics and consider mathematics as a possible career field in the future. A more formal study of the efficacy of the math clubs is underway. Questions posed relate to girls' attitudes and confidence as well as teacher attitudes. The state test scores will also be examined to determine if club participation results in enhanced performance.

The funding from MAA/Tensor has been instrumental in initiating these clubs. It is the author's hope that the program becomes institutionalized at Texas Tech through the funding of an instructor and continued support for graduate student and undergraduate participants in service-learning projects.

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Collaborative Research Grants for Women

Dedicated to the memory of Ruth Michler

AWM will continue to offer Collaborative Research Grants 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.) We anticipate offering one or two grants for amounts up to \$2500 in 2006. Each grant may be used to 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. All travel must be completed within one year of the award. For foreign travel, US air carriers must be used (exceptions only by prior approval from AWM).

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 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) the AWM Collaborative Research Grant Form; 2) a cover letter; 3) a curriculum vita; 4) a research proposal (approximately five pages in length) which specifies why the proposed travel would be particularly beneficial; 5) 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; 6) a proposed budget; and 7) information about other sources of funding available to the applicant. A final report will be required from each awardee. Awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

Send *five* complete copies of the application materials (including the cover letter) to: Collaborative Research Grant Selection Committee, AWM, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. For further information: phone 703-934-0163, e-mail awm@awm-math.org, or visit www.awm-math.org. Applications must be received by **February 1, 2006**; applications via e-mail or fax will not be accepted.

Survey: Minority Students Key to Maintaining US Edge in Science

Barbara Schoetzau, New York, 26 May 2005, Voice of America, www.voanews.com

A new nationwide survey of minority parents underscores concerns that the United States risks losing its competitive edge unless more women and minority students pursue careers in science and engineering.

The under-representation of women, African Americans, Hispanics and Native Americans in science and engineering fields has been well documented. At the same time, fewer students are pursuing careers in those fields.

The situation has led the National Science Foundation to warn that US leadership in science and engineering could be threatened unless personnel trends change.

Some experts believe that the United States can remain competitive by encouraging more girls and under-represented minorities to study science and engineering.

The new survey by the Bayer Corporation focuses on parental attitudes towards science education and finds that 90 percent of those surveyed think their children can do well in science. But spokesperson Mae Jemison says the survey also found a bias that may discourage young women from considering science studies.

"Parents thought that there were greater challenges to girls in science, about a 10 percent spread. They also were less confident about girls doing as well in sciences, that is, their daughters doing well, than their sons," she said.

According to the survey's findings, misunderstandings about educational requirements are another obstacle. Jemison, the first African-American woman astronaut, says 50 percent of the parents surveyed thought advanced degrees were necessary for jobs in science and engineering fields.

"They did not recognize, for instance, that the person who dressed me in my space shuttle suit, who took care of all my equipment, that is a science and engineering career and they did not have a college degree, but they were science literate," she noted.

Still, the 1,000 parents surveyed said science education, particularly in elementary school, is key to ensuring that

more women and minorities enter science and engineering fields. Jemison says the majority of the parents recommended a more hands-on approach to science education, helping students learn science concepts instead of facts and figures.

"The overwhelming majority of parents said science needs to be taught hands-on," she explained. "That is, you need to wire a flashlight in order to understand electricity. They also recommended that science get more emphasis in the classroom. They also made recommendations that the scientific industry get the word out more about the jobs and opportunities there are in the science fields and that you do not require a Ph.D. to do everything."

The survey was sponsored by the Bayer Corporation as part of its program called Making Science Make Sense. The program encourages scientists working for the health-care corporation to volunteer in their local communities, working with students and teachers in schools, conducting experiments, and serving as judges at science fairs.

Bayer company spokesperson Sarah Toulouse says more than 1,000 employee volunteers currently participate in the program. She says one popular experiment uses one of the Bayer Corporation's best-known products, the antacid tablet Alka Seltzer, to teach children about pressure and chemical reactions.

"We give them a canister and we fill it up with a little bit of water and we have them drop a piece of the Alka Seltzer tablet into the film canister, put the lid on the top, shake it up a little bit," she said. "They can experiment to see how high the film canister goes based on how much water they put into it or how much Alka Seltzer they put into it. So they really have to think like a scientist and observe what happened and make predictions and evaluate what they see."

Ms. Toulouse says the Bayer Corporation hopes the survey results will lead to a national forum to encourage science education and parent participation.

Bayer Media press release

The Bayer Facts of Science Education XI: American Parents Speak Out About Their Children and Science survey team polled 1,000 American parents who have at least one boy and one girl between the ages of 5 and 18 living at home. In addition, in order to include under-represented minorities, interviews with African-American, Native American and Hispanic American parents who fit the same profile

were added until each of these groups contained 250 completed surveys. A total of 1,500 surveys were conducted in March and April 2005.

Overall, the survey found that parents across the board think both their sons and daughters are potential winners when it comes to science and math. Many report their sons (88 percent) and daughters (85 percent) are interested in science, math or engineering. Six in 10 (63 percent) parents report their sons have already expressed an interest in continuing to study or have a career in these fields, while four in 10 (42 percent) report their daughters have expressed such an interest.

They're interested, but can they succeed? Yes, say parents. Almost all parents (96 percent sons; 95 percent daughters) are confident that their sons and daughters have the ability to succeed in these subjects in school, with nearly three-fourths (75 percent sons; 73 percent daughters) feeling "very confident." In addition, nearly all of the parents (92 percent sons; 90 percent daughters) are confident that their children have the ability to succeed in S&E careers, with half or more saying they are "very confident" (69 percent sons; 57 percent daughters).

Virtually all parents see these careers as desirable for their sons (91 percent) and their daughters (86 percent). And, upon learning that many jobs in these fields do not require advanced degrees beyond a bachelor's, most parents (88 percent) believe these fields present realistic job opportunities for their children. However, almost all parents across the board (88 percent) believe the S&E communities need to do a better job telling today's students about these job opportunities.

While the survey uncovers parents' overall positive attitudes about their sons' and daughters' abilities to achieve in science in school and beyond, at the same time it reveals a subtle gender bias that favors their sons. This bias is revealed in the strength of their answers to a series of questions. For example, while almost all (91 percent sons; 86 percent daughters) believe these careers are desirable for their children, 65 percent say they are "very desirable" for their boys and 41 percent say "very desirable" for their girls. In addition, while nearly all parents (92 percent sons; 90 percent daughters) are confident their children can succeed in S&E fields, 69 percent are "very confident" about their boys and only 57 percent are "very confident" about their girls.

"First and foremost, we must applaud parents for recognizing their sons' and daughters' capacity to succeed in science, math and engineering fields, and for encouraging and assisting them regularly in their formal and informal science education," said Dr. Mae C. Jemison, the nation's first African-American female astronaut and Bayer's national MSMS spokesperson. "That said, parents, and all adults for that matter, need to be aware that our own unspoken biases are often communicated unknowingly to our children with negative impacts. When it comes to science, math and engineering, we must acknowledge that for the United States to build and maintain the kind of creative and inquisitive research that keeps discovery and innovation alive, everyone must have a seat at the table."

In learning science, more parents identify challenges for their daughters than they do for their sons. When asked to evaluate such possible challenges, parents indicated the following as either a big challenge or somewhat of a challenge:

- Science classes are boring or uninteresting (58 percent girls; 51 percent boys)
- Teachers who are poorly qualified to teach science (57 percent girls; 47 percent boys)
- Few good science role models or mentors for them (56 percent girls; 45 percent boys)
- Science is a difficult subject to learn (54 percent girls; 43 percent boys)

Issues many parents believe pose either little or no challenge at all for their children include:

- Science is not a "cool" subject (64 percent girls; 67 percent boys)
- Teachers who hold the view that their sons and daughters don't belong in science (69 percent girls; 75 percent boys)

"The good news here is that old stereotypes seem to be breaking down," said Jemison. "The fact that science is no longer seen as 'nerdy' and that teachers are seen as inclusive when it comes to boys and girls in science—these are big steps in the right direction."

2003 TIMSS

press release

The results of the 2003 Trends in International Mathematics and Science Study (TIMSS) released in December 2004 indicate that the United States has made impressive gains in science achievement at the eighth-grade level—particularly among minorities—but much work remains to be done to ensure all students achieve world-class standards in science.

“The TIMSS study helps us to understand what we are doing well and what we need to pursue in the future. While we have made tremendous gains at the middle grades, and among some minorities, a lack of improvement at the elementary level tells us we cannot afford to be complacent,” said National Science Teachers Association (NSTA) Executive Director Gerald Wheeler.

According to TIMSS 2003, formerly called the Third International Mathematics and Science Study, US eighth-grade scores in science have improved significantly from 1995 to 2003—increasing from 513 to 527. The United States is the only G-8 nation to show a significant increase in overall science achievement. These results place the United States ninth among all 45 participating countries in eighth-grade science achievement.

“TIMSS shows us that our middle level students are making impressive gains in science, and we need to continue to fuel and fund this upward movement,” said Anne Tweed, NSTA President. “Our progress is impressive, but our ultimate goal is to see all our students performing at higher world-class levels.”

Optimism for the gains of US eighth graders should be tempered, however, by concern about the stagnant scores of fourth graders. TIMSS 2003 indicates that US fourth-grade science scores remained flat, with a slight decline of 6 points from 1995 to 2003. In 1995, only Japan outperformed US fourth graders. In 2003, both Singapore and Japan outperformed our fourth graders.

“The lack of improvement at the elementary level does not surprise us,” said Wheeler. “We’ve been hearing from many

elementary teachers that they are not teaching science because of the increased emphasis on literacy. Science is essentially being squeezed out of the elementary classroom.”

Science achievement among minorities can also be interpreted as “good news/bad news.” Since 1995, eighth-grade African American students have made remarkable gains of 40 points in science, while Hispanic student scores jumped 36 points. At the fourth-grade level, African Americans narrowed the racial gap with a healthy 25-point increase in scores. Unfortunately, the same did not occur for Hispanic fourth graders, whose achievement scores remained flat across the two testing periods.

“The impressive increase in science scores among minority students is a great achievement,” said Tweed. “However, these students still rank at the bottom when compared to their international counterparts.”

While much more work needs to be done to further narrow the achievement gap, NSTA applauds the efforts of science teachers, scientists, and other stakeholders over the past decade that have contributed to the increased scores of middle level students. These efforts include the National Science Education Standards, the National Science Foundation systemic reform initiatives, and the increase in quality instructional materials and professional development opportunities for teachers.

The National Science Education Standards present a cohesive vision of what our students are expected to know and be able to do in science. Most states have successfully incorporated the standards into state benchmarks, and it appears that efforts to integrate these learning goals

into middle level classroom instruction are beginning to produce positive results.

The education community is digesting the TIMSS results in the wake of the PISA study, also released in December 2004, which compared the application of knowledge for 15-year-olds in various subjects. The results of this study indicated that US students did not fare well in math or science when compared to their international counterparts. The PISA further emphasizes the challenges at the high school level.

“The PISA results suggest that more science education reforms need to be focused at the high school level,”

The United States has made impressive gains at the eighth-grade level—particularly among minorities—but much work remains to be done to ensure all students achieve world-class standards in science.

said Wheeler. “It is clear that students are not taking enough science courses to prepare them for these assessments—and even more importantly, for the workplace they will soon enter.”

While most states have been increasing the number of science credits necessary for graduation, a report by the Council of Chief State School Officers indicates few states require students to take science every year during high school. As of 2002, only 21 states required three credits of high school science, and only four states required four credits.

The National Science Teachers Association is the largest professional organization in the world promoting excellence and innovation in science teaching and learning for all. NSTA’s current membership includes more than 55,000 science teachers, science supervisors, administrators, scientists, business and industry representatives, and others involved in science education.

Political Intrusions into the Academy

press release

The American Association of University Professors’ website (www.aaup.org) now features a collection of resources on issues relating to government intervention in higher education. The collection includes materials on the “academic bill of rights” legislation proposed in several states, politicization of science, federal government oversight of international studies centers on college campuses, and other emerging issues. The site is active and will be home to new materials on these topics as they become available.

The section on the “Academic Bill of Rights,” the most developed part of the new feature, includes the following documents: Academic Bill of Rights Legislation: Summary and Comments, AAUP Statement on the Academic Bill of Rights, and AAUP Policies In the Classroom: Academic Freedom for Students and Faculty. The page also provides links to information about current and past state legislation in California, Colorado, Georgia, Indiana, and Ohio, and a growing list of related articles. To find all articles on government intrusions into higher education, go to www.aaup.org/Issues/ABOR/Political%20intrusion1.htm.

AWM Conflict of Interest Policy

A conflict of interest may exist when the interest (financial or other) or concerns of any member of AWM, or the member’s immediate family, or any group or organization to which the member has an allegiance or duty, may be seen as competing or conflicting with the interests or concerns of AWM.

When any such potential conflict of interest is relevant to a matter requiring participation by the member in any action by AWM or any of its committees to which the member belongs, the interested party shall call it to the attention of AWM or the committee and such person shall not vote on the matter. Moreover, the person having a conflict shall retire from the room in which the organization or its committee is meeting (or from a conference call) and shall not participate in the final deliberation or decision regarding the matter under consideration.

The foregoing requirements shall not be construed as preventing the member from briefly stating her position in the matter, nor from answering pertinent questions of other members, as her knowledge may be of great assistance.

The minutes of the meeting of the organization or committee shall reflect when the conflict of interest was disclosed and when the interested person did not vote. When there is a doubt as to whether a conflict of interest exists, and/or whether a member should refrain from voting, the matter shall be resolved by a vote of the organization (or its committee), excluding the person concerning whose situation the doubt has arisen.

A copy of this conflict of interest statement passed by the AWM Executive Committee, Vancouver, 8/16/1993, shall be published once a year in the *AWM Newsletter*, and any member serving as an officer or on a committee shall be advised of the policy upon undertaking her duties.



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High-Quality Jobs in the 21st Century

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See www.nationalacademies.org for the full report; search on *Gathering Storm*.

The unmatched vitality of the United States' economy and science and technology enterprise has made this country a world leader for decades, allowing Americans to benefit from a high standard of living and national security. But in a world where advanced knowledge is widespread and low-cost labor is readily available, US advantages in the marketplace and in science and technology have begun to erode. A comprehensive and coordinated federal effort is urgently needed to bolster US competitiveness and pre-eminence in these areas so that the nation will consistently gain from the opportunities offered by rapid globalization, says a new report from the National Academies.

Given the United States' history of economic and scientific pre-eminence, it is easy to be complacent about these complex issues, the report says. Some indicators that illustrate why decisive action is needed now follow:

- For the cost of one chemist or one engineer in the United States, a company can hire about five chemists in China or 11 engineers in India.
- Last year chemical companies shuttered 70 facilities in the United States and have tagged 40 more for closure. Of 120 chemical plants being built around the world with price tags of \$1 billion or more, one is in the United States and 50 are in China.
- US 12th-graders recently performed below the international average for 21 countries on a test of general knowledge in mathematics and science. In addition, an advanced mathematics assessment was administered to students in 15 other countries who were taking or had taken advanced math courses, and to US students who were taking or had taken pre-calculus, calculus, or Advanced Placement calculus. Eleven countries outperformed the United States, and four scored similarly. None scored significantly below the United States. In 1999 only 41 percent of US

eighth-graders had a math teacher who had majored in mathematics at the undergraduate or graduate level or studied the subject for teacher certification—a figure that was considerably lower than the international average of 71 percent.

- Last year more than 600,000 engineers graduated from institutions of higher education in China. In India, the figure was 350,000. In America, it was about 70,000.
- In 2001 US industry spent more on tort litigation than on research and development.

Without a major push to strengthen the foundations of America's competitiveness, the United States could soon lose its privileged position. The ultimate goal is to create new, high-quality jobs for all citizens by developing new industries that stem from the ideas of exceptional scientists and engineers.

The congressionally requested report (written by a 20-member committee that included university presidents, CEOs, Nobel Prize winners, and former presidential appointees) makes four recommendations along with 20 implementation actions that federal policy-makers should take to create high-quality jobs and focus new science and technology (S&T) efforts on meeting the nation's need for clean, affordable, and reliable energy. Some actions will involve changing existing laws, while others will require financial support that would come from reallocating existing budgets or increasing them. The committee believes that ongoing evaluation of the results should be included in all of the measures.

"America must act now to preserve its strategic and economic security by capitalizing on its knowledge-based resources, particularly in S&T, and maintaining the most fertile environment for new and revitalized industries that create well-paying jobs," said committee chair Norman R. Augustine, retired chairman and CEO of Lockheed Martin Corp., Bethesda, MD. "The building blocks of our economic leadership are wearing away. The challenges that America faces are immense."

A brief overview of the four recommendations follows, with a sample of proposed actions to implement them.

Increase America's talent pool by vastly improving K-12 mathematics and science education. Among the recommended implementation steps is the creation of a merit-based scholarship program to attract 10,000 exceptional

students to math and science teaching careers each year. Four-year scholarships, worth up to \$20,000 annually, should be designed to help some of the nation's top students obtain bachelor's degrees in physical or life sciences, engineering, or mathematics—with concurrent certification as K–12 math and science teachers. After graduation, they would be required to work for at least five years in public schools. Participants who teach in disadvantaged inner-city or rural areas would receive a \$10,000 annual bonus. Each of the 10,000 teachers would serve about 1,000 students over the course of a teaching career, having an impact on 10 million minds, the report says.

Sustain and strengthen the nation's commitment to long-term basic research. Policy-makers should increase the national investment in basic research by 10 percent each year over the next seven years. Special attention should be paid to the physical sciences, engineering, mathematics, and information sciences, and to basic research funding for the US Department of Defense, the report says. Policy-makers also should establish within the US Department of Energy an organization called the Advanced Research Project Agency – Energy (ARPA-E) that reports to the undersecretary for science and sponsors “out-of-the-box” energy research to meet the nation's long-term energy challenges. Authorities should make 200 new research grants annually—worth \$500,000 each, payable over five years—to the nation's most outstanding early-career researchers.

Develop, recruit, and retain top students, scientists, and engineers from both the United States and abroad. The United States should be considered the most attractive setting in the world to study and conduct research, the report says. Each year, policy-makers should provide 25,000 new, competitive four-year undergraduate scholarships and 5,000

new graduate fellowships to US citizens enrolled in physical science, life science, engineering, and mathematics programs at US colleges and universities. Policy-makers should provide a one-year automatic visa extension that allows international students to remain in the United States to seek employment if they have received doctorates or the equivalent in science, technology, engineering, mathematics, or other fields of national need from qualified US institutions. If these students then receive job offers from employers that are based in the United States and pass a security screening test, they should automatically get work permits and expedited residence status. If they cannot obtain employment within one year, their visas should expire.

Ensure that the United States is the premier place in the world for innovation. This can be accomplished by actions such as modernizing the US patent system, realigning tax policies to encourage innovation, and ensuring affordable broadband Internet access, the report says.

Policy-makers should provide tax incentives for innovation that is based in the United States. The Council of Economic Advisers and the Congressional Budget Office should conduct a comprehensive analysis to examine how the United States compares with other nations as a location for innovation and related activities, with the goal of ensuring that the nation is one of the most attractive places in the world for long-term investment in such efforts.

The Research and Experimentation Tax Credit is currently for companies that increase their R&D spending above a predetermined level. To encourage private investment in innovation, this credit, which is scheduled to expire in December, should be made permanent. And Congress and the administration should increase the allowable credit from 20 percent to 40 percent of qualifying R&D investments.

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Publications of Interest

“Racial Equity Requires Teaching Elementary School Teachers More Mathematics”: the title of Patricia Clark Kenshaft’s article in the February 2005 AMS *Notices* makes her viewpoint clear. Some short excerpts:

Like most Americans, I found it difficult to believe how poorly prepared mathematically [elementary school teachers] are. They are well chosen. They are kind, diligent, and smart, qualities that nobody can teach. They have been failed mathematically by our system. They need to be taught. I have found them eager and quick to learn—and appallingly ignorant of the most basic mathematics.

It has been my observation that the reason that scores are higher in white districts is that some parents teach their children mathematics at home, and these children teach many of the others. It has appeared to me that the teachers are no better prepared in the high-scoring districts.

Children who have been mathematically abused are much less able to benefit from mathematically competent teachers when they finally reach them. One lesson our current elementary school teachers convey powerfully is that math is too difficult to understand. Because knowledge of mathematics correlates strongly with economic and political achievement, the mathematical education of all elementary school teachers is the paramount equity issue. As Will Rogers said long ago, “You can’t teach what you don’t know any more than you can come back from where you ain’t been.”

“Culture Matters: An Interview with Genevieve Bell” by Kelly Goto and Subha Subramanian, published at www.gotomedia.com/gotoreport/november2004/news_1104_bell.html, describes the work of a cultural anthropologist at Intel. In case you are wondering, as was I, what that would entail, here is part of her answer to the question “Can you describe the experiences that led you to a career in cultural anthropology at Intel?”

I joined Intel 6 years ago. I had just finished my Ph.D. at Stanford and I hoped to be teaching at a small liberal arts college somewhere. Doing anthropology in an industry context wasn’t the career I expected at all. But ... I met this man in a bar in Silicon Valley who ran a small IT start-up. I mentioned to him that I was an anthropologist. He tracked me down the next day and offered me a job. At first, I declined. I had a tough time understanding what an anthropologist could do in the technology field.... [A]t Intel, I was lucky enough to join a team of like-minded social scientists who had been working for a number of years to get Intel to take its end-users seriously—to really think about the people who used their technology.... [I]t has been interesting to see what anthropology can do, not only for Intel, but for the technology industry as a whole.

As an example, she explains how the family culture in Indonesia results in different usage of cell phones from what is common in the US. She gives another cultural difference: “[E]ven [something as] straightforward as the ‘desktop’ actually implies a whole way of making sense of the world that is quite Western—desktop, recycling trash can, inbox, folders and mail are all concepts that come out of a particular notion of work, and organizational infrastructure that might not be as transparent as we imagine.” Read the full article online for more interesting insights.

Women@SCS, School of Computer Science, Carnegie-Mellon University, has produced a great poster about women in computer science as part of its outreach efforts. The high resolution version of the poster is freely available at women.cs.cmu.edu/What/Outreach/csposter.pdf. Members of the Women@SCS advisory council are committed to encouraging, supporting and mentoring others while increasing the visibility and impact of women and minorities in the computer sciences. Their program of outreach activities is continually evolving. The poster was inspired by discussions with high school computer science teachers at a summer workshop who were eager to have materials to enhance the image of CS, help dispel the impression that CS = programming, and encourage students to study CS. For further info, see women.cs.cmu.edu/What/Outreach/.

Although “Gender and the Administrative Search” by Jean Dowdall appeared in a June 2003 issue of *The Chronicle of Higher Education*, its message is still timely. Dowdall was the consultant for a presidential search at a small women’s college, where many strong women candidates emerged during the search process. She says:

I have a theory about this remarkable abundance of strong candidates; I suspect that there is enough resistance to female candidates in the presidential searches at coed institutions that, when a search comes along at a women’s college, the pent-up demand surges forth. And the many women who have been waiting for just such an opportunity jump into the competition because they think they have a chance of success.

Another possible interpretation is that women who aren’t generally interested in a presidency are interested in the presidency of a women’s college because it reflects some of their most important commitments.

She goes on to make a number of suggestions about what institutions might do to give women fair consideration for administrative positions, and also gives some pointers to women with regard to how they present themselves in their applications. “Subjective elements of style and self-presentation are critical in the selection process,” and it is important for women to avoid subtly undercutting their own talents. It’s important for men to avoid this too, of course, but presently women seem to have more trouble with this. Read the full story at chronicle.com/jobs/2003/06/2003062001c.htm.

NSF-AWM Travel Grants for Women

The objective of the NSF-AWM Travel Grants program is to enable women researchers in mathematics or in mathematics education 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. All awards will be determined on a competitive basis by a selection panel consisting of distinguished mathematicians appointed by the AWM.

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 \$1500 for domestic travel and of \$2000 for foreign travel will be applied. For foreign travel, U.S. air carriers must be used (exceptions only per federal grants regulations; prior AWM approval required).

Eligibility. These travel funds are provided by the Division of Mathematical Sciences (DMS) and the Division of Research, Evaluation and Communication (REC) of the NSF. The conference or the applicant’s research must be in an area supported by DMS. Applicants must be women holding a doctorate (or equivalent experience) and with a work address in the USA (or home address, in case of unemployed mathematicians). Anyone who has been awarded an AWM-NSF travel grant in the past two years is ineligible. Anyone receiving a significant amount of external governmental funding (more than \$2,000 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.

Applications. An applicant should send *five* copies of 1) the AWM Travel Grant Form, where conference name, conference dates and location (city/state/country), and amount of support requested should be provided, 2) a cover letter, 3) a description of her current research and of how the proposed travel would benefit her research program, 4) her curriculum vitae, 5) a budget for the proposed travel, and 6) 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, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030. If you have questions, contact AWM by phone at 703-934-0163 or by e-mail at awm@awm-math.org. Applications via e-mail or fax will not be accepted. There are three award periods per year. The next two deadlines for receipt of applications are **February 1, 2006** and **May 1, 2006**.

Opportunities

Summer Mathematics Program for Women

The mathematics departments of Carleton and St. Olaf Colleges intend, pending renewed funding from NSF, to offer again our month-long summer mathematics program for eighteen mathematically talented first- and second-year undergraduate women. By introducing them to new and exciting areas of mathematics that they would not see in a standard undergraduate curriculum, and by honing their skills in writing and speaking mathematics, the program leaders endeavor to excite these women on to advanced degrees in the mathematical sciences, and, more importantly, to increase each woman's confidence in her own abilities and connect them all into a supportive network to carry them through their undergraduate and graduate education.

At the heart of the program are two demanding, intense courses under the supervision of female faculty who are active in research and reknowned for their teaching. In past summers we have had the following instructors: Judy Kennedy (Topological Dynamical Systems), Erica Flapan (Knots and Chemistry), Laura Chihara (Algebraic Coding Theory), Karen Brucks (Low-Dimensional Dynamical Systems), Margie Hale (Fuzzy Logic), Rhonda Hatcher (Game Theory), Katherine Crowley (Morse Theory) and others. Besides the coursework, participants take part in a variety of mathematical events: panel discussions on graduate schools and careers, colloquia on a variety of topics, recreational problem-solving, and visits from at least one REU organizer and the organizer of the Budapest Semester. The mathematical part of the program is balanced with optional weekend events including canoeing, hiking, picnics, and tubing.

Past participants (through program evaluations and the list server set up for their correspondence) report increased facility with mathematics, bolstered self-confidence, and new or renewed excitement toward mathematics.

If you have first- or second-year women students whom you think would benefit from a demanding, invigorating month-long exposure to mathematics next summer (June 18–July 16), please refer them to our web page at <http://www.mathcs.carleton.edu/smp> or have them contact Deanna Haunsperger at Dept. of Math/CS, Carleton College, Northfield, MN 55057 (dhaunspe@carleton.edu). Application deadline is **February 24, 2006**.

Opportunities in Display Ads

Several excellent opportunities are featured in display advertisements this issue; see pages 28 and 29. (We appreciate the advertising dollars!) Please check them out. They include: **DIMACS Reconnect '06 Conference**, Morgan State University; **22nd Annual Southeastern Analysis Meeting**, University of Florida; **IAS/Park City Mathematics Institute (PCMI)**, Park City, Utah; **Summer Math Institute**, Cornell University; and **Junior Year Visiting Program for the Study of Mathematics**, Smith College.

NSF-CBMS Regional Research Conferences

The National Science Foundation has funded four NSF-CBMS Regional Research Conferences to be held during the spring and summer of 2006. These four will bring to 306 the total number of such conferences since the NSF-CBMS Regional Research Conference Series began in 1969. These conferences are intended to stimulate interest and activity in mathematical research. Each five day conference features a distinguished lecturer who delivers ten lectures on a topic of important current research in one sharply focused area of the mathematical sciences.

The four conferences to be held in 2006 are:

- Mathematical and Numerical Treatment of Fluid Flow and Transport in Porous Media; Zhangxin (John) Chen, lecturer; May 22–26, 2006 at the University of Nevada Las Vegas;
- Cluster Algebras and Applications; Andrei Zelevinsky, lecturer; June 13–17 at North Carolina State University;
- The Interplay between Convex Geometry and Harmonic Analysis; Alexander Koldobsky, lecturer; July 29–August 2 at Kansas State University
- Probabilistic and Combinatorial Approach in Analysis; Mark Rudelson, lecturer; August 6–12 at Kent State University

The NSF expects to support up to seven of these regional research conferences in 2007. Proposals must be submitted electronically via Fastlane to the Division of Mathematical Sciences – Infrastructure Program at NSF. **April 7, 2006** is

the target date for submission of proposals. For further information on this year's conferences and on the submission process, see www.cbmsweb.org.

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 60 students per semester. The application deadlines for fall 2006 and spring 2007 are **April 30, 2006** and **November 1, 2006** respectively; early applications (by as much as a year) are encouraged.

Achievements

Ellen Maycock Named Director of AMS Membership & Professional Programs

AMS press release

Ellen Maycock, Johnson Family University Professor and professor of mathematics at DePauw University, has been appointed associate executive director of the AMS, effective September 2005. She succeeds James W. Maxwell, who has entered partial retirement and continues to work on selected projects part-time for the Society.

In her new position, Maycock oversees the meetings, public awareness, and membership and programs departments of the AMS. Among other activities, these departments conduct surveys, manage career and employment services, run research conferences, publish Math in the Media and the Feature Column on the web, provide information for department leaders and students, and administer grants and fellowships.

"It is very exciting to think about being involved at the national level," she remarked. "The profession is changing rapidly, and there are new pressures on all of us.

I have always been interested in not only the subject of mathematics, but also the people in mathematics—mathematicians. I feel I might have a chance of making a difference for them."

Maycock received her bachelor's degree in mathematics and economics in 1972 from Wellesley College. She earned her Ph.D. in mathematics in 1986 at Purdue University, with a dissertation in operator algebras written under the direction of Jerome Kaminker. Maycock is perhaps best known for her development of innovative approaches to teaching abstract algebra. She created a course that used a software package called Exploring Small Groups to help students grasp algebraic concepts.

Maycock wrote "Laboratory Experiences in Group Theory," which was published in 1996 by the Mathematical Association of America (MAA) in its series *Classroom Resource Materials*. She is also co-editor, with Allen Hibbard, of "Innovations in Teaching Abstract Algebra," a collection of essays published in the *MAA Notes* series in 2002. Maycock has lectured widely on the use of technology in teaching undergraduate mathematics and has given several workshops and minicourses on the subject. "Technology gives students an easy way to generate a lot of examples, and then they can start to recognize patterns," she explained.

"We're all sad to see Jim Maxwell step down, but are eagerly awaiting Ellen's arrival," said AMS executive director John H. Ewing. "She brings valuable experience to the Society and fresh ideas. And she will forcefully remind us that the AMS represents all mathematicians, from the largest universities to the smallest colleges. This is a great opportunity for us."

Katherine Heinrich and Yu-Ru Liu Honored for Outstanding Achievements

CMS press release

The recipient of the Canadian Mathematical Society's Adrien Pouliot Award for 2005 is Dr. Katherine Heinrich (University of Regina), and Dr. Yu-Ru Liu (University of Waterloo) is the winner of the 2005 G. de B. Robinson Prize. The awards were presented at the CMS 2005 Winter Meeting Banquet on December 11th at the Empress Hotel, Victoria, British Columbia.

The Adrien Pouliot Award is for individuals, or teams of individuals, who have made significant and sustained contributions to mathematics education in Canada.

Heinrich's most significant achievement in the area of mathematics education is the idea for a Canadian Mathematics Education Forum as a venue for people interested in mathematics education at all levels: mathematicians, math educators, teachers of mathematics from every level, representatives of school boards, ministries of education, industry, and parents, to meet and talk together about issues of common interest.

The first Forum, held in Québec City in 1995, set the stage for many activities that followed. In British Columbia, Forum participants organized the BC Mini-forum for Education in Mathematics (December 1995). This event led to the Pacific Institute for the Mathematical Sciences "Changing the Culture" annual conference which, for the past eight years, has brought together people interested in math education. In Ontario, the spirit of the 1995 Forum is continued with the Fields Institute Mathematics Education Forum.

In 2001, the Canadian Mathematical Society revived Heinrich's Forum concept. The second Forum took place in Montreal (hosted by UQAM) in May 2003 and the third Forum (hosted by the Fields Institute) was held in May 2005. Many new initiatives have grown out of these Fora. A new Canada-wide teachers' organization is being created and Canadian indigenous people are becoming partners in the discussions on mathematics education. These Fora are on the verge of becoming an institution.

The inspiration for the 1995 Forum arose from Heinrich's significant involvement in mathematics education and the promotion of mathematics. In 1982 she organized the first Mathematics Enrichment Conference for grade 11 students at Simon Fraser University. This three-day event, which continued annually for the next 15 years, provided inspiration to generations of British Columbia students. Heinrich was a co-organizer of "Women Do Math" (later renamed "Discover the Possibilities"), a mathematics conference designed to reach girls in grades 9 and 10, and a co-organizer of "Math in the Malls," a series of displays with hands-on activities, organized in several Vancouver area shopping malls in the early 1990s. She took an active role in lobbying to have Mathematics as a category at Canada Wide Science Fairs. Her legacy of involvement in mathematics education continues to be felt across the country.

Katherine Heinrich received her Ph.D. in mathematics from the University of Newcastle, Australia, in 1979. In 1981, she joined the Department of Mathematics and Statistics at Simon Fraser University as an Assistant Professor on a Natural Sciences and Engineering Research Council of Canada (NSERC) University Research Fellowship. She was promoted to the rank of Professor in 1987 and, from 1991–1996, was Chair of the Department. From 1999, she has held the position of Vice-President (Academic) at the University of Regina. During the last several years Heinrich has served as a member of the Interim Governing Council of the University of Northern British Columbia, the Board of Governors of Simon Fraser University, the Youth Science Foundation of Canada and the Canadian Mathematical Society. She was President of the Canadian Mathematical Society from 1996 to 1998. For six years she served as a member of the BC Science Council Awards Committee. Recently she was a member of an NSERC Grant Selection Committee and the National Killam Selection Committee. She is currently a member of the NSERC Council.

In 1995, she was awarded both the Vancouver YWCA Woman of Distinction Award in Education, Training and Development and the University of Newcastle Gold Medal for Professional Excellence.

Her research interests include graph factoring problems, the design and application of Latin squares and more generally the "mathematics of arrangements" that enable the construction of computer networks, scheduling of tournaments and secure transmission of information.

The G. de B. Robinson Award was inaugurated to recognize the publication of excellent papers in the *Canadian Journal of Mathematics* and the *Canadian Mathematical Bulletin* and to encourage the submission of the highest quality papers to these journals.

The 2005 G. de B. Robinson Award is awarded to Dr. Yu-Ru Liu, University of Waterloo, for her two papers entitled "A Generalization of the Turan Theorem and its Applications" and "A Generalization of the Erdos-Kac Theorem and its Applications" which were published in the *Canadian Mathematical Bulletin* in 2004.

A classical theorem of Hardy and Ramanujan states that the normal number of prime divisors of a natural number n is $\log \log n$. Their difficult proof was simplified by Turan in 1934 and was subsequently amplified by Erdős and Kac in their monumental creation of probabilistic number theory.

In her two papers, Liu shows that the theorems of Turan, as well as the subsequent generalizations by Erdős and Kac, apply to a wider geometric context. Most notable is the application to the study of points on varieties over finite fields. The papers represent an elegant mélange of probability theory, analytic number theory and algebraic geometry.

Dr. Yu-Ru Liu obtained her bachelor's degree from McGill University in 1997, and she completed her master's degree at Queen's University in 1998. Under the direction of Barry Mazur, she completed her doctoral work at Harvard University in 2003. The two papers which appeared in the *Canadian Mathematical Bulletin* in 2004 are based upon her doctoral thesis. Liu currently holds a University Faculty Award at the University of Waterloo.

MAA MathFest Awards

MathFest 2005 Prizes and Awards booklet

Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member

The award was established in January 2003 to honor beginning college or university faculty whose teaching has been extraordinarily successful and whose effectiveness in teaching undergraduate mathematics is shown to have influence beyond their own classrooms. An awardee must have taught full time in a mathematical science in the United States or Canada for at least two, but not more than seven, years since receiving the Ph.D. Henry Alder was MAA President in 1977 and 1978 and served as MAA Secretary from 1960 to 1974.

Sarah Greenwald

Sarah Greenwald is an Associate Professor at Appalachian State University in Boone, N.C. Her peers and students attest to her effectiveness as a well-prepared, thoughtful, and enthusiastic teacher both inside and outside the classroom. She is a proponent of active learning in the classroom using a variety of teaching methods and technology-enhanced activities. For a number of courses she created materials utilizing appropriate, significant mathematical content in *The Simpsons* cartoon. This work has received media attention, is available on a website for many others to use, and has been published

with co-author Andrew Nestler in *PRIMUS* and *Math Horizons*. She has also shared in *PRIMUS* ideas on using writing projects in teaching geometry, and she has written with Holly Hirst an article on current practices in quantitative literacy that is to appear in an upcoming *MAA Notes* volume. She was a 1999 Project NExT Fellow and a 1999 and 2000 recipient of an NSF Research Opportunity Award.

Biographical Note

Sarah J. Greenwald received her Ph.D. in 1998 from the University of Pennsylvania and her B.S. from Union College in Schenectady, NY in 1991. Her scholarship areas include the Riemannian geometry of orbifolds, popular culture in mathematics, the shape of the universe, and women and minorities in mathematics. She has received NSF ROA Awards and an MAA Tensor grant and has been heavily involved in MAA service. She recently appeared on NPR's *Science Friday* radio show.

Response from Sarah Greenwald

I'm thrilled to receive this award from the MAA. Thanks to my students at Appalachian for making teaching fun and for their curiosity, their sense of humor, their willingness to learn, and for teaching me all that they have over the last seven years. I greatly appreciate the many people who have helped me make it easier for my students to connect to mathematics and who have influenced and inspired my teaching, articles, and webpages. There are too many people to acknowledge here, but special thanks go to Bill Bauldry, Ann Bies, Holly Hirst, Amy Ksir, Andrew Nestler, Susan Niefield, Arnold Seiken, Karl Zimmermann, and the writers of *The Simpsons* and *Futurama*. I dedicate this award to the memory of my mother, who was also a teacher. She believed in me and encouraged me to do my best, a message I've passed on to my students.

Laura Taalman

Laura Taalman is an Assistant Professor at James Madison University, Harrisonburg, Virginia. Her rave reviews from students and colleagues alike include statements such as "in her first semesters in a senior level algebra course, student demand was two to three times the normal level," even though her courses are known to be very demanding. She developed an integrated calculus/precalculus sequence that had brought a much larger group of students into the mainstream science

calculus track and led to the decision by the biology department at James Madison University to move ALL its students into the mainstream track. She has written a text *Integrated Calculus*, used by other faculty at James Madison and some faculty at other colleges, which helps underprepared students succeed in calculus study. As a faculty mentor for an NSF-sponsored REU program, she has directed four women on research in knot theory (soon to be published), and she also continues to do research work in algebraic geometry. As a 2000 Project NExT Fellow, she has organized sessions and made many presentations at national and sectional MAA meetings and elsewhere.

Biographical Note

Laura Taalman grew up in rural Connecticut, was an undergraduate at the University of Chicago, and earned her Ph.D. in mathematics at Duke University in 2000. She is now an Assistant Professor at James Madison University, where she recently published a textbook that combines calculus, precalculus, and algebra into one course. When not teaching or supervising undergraduate research, Laura spends time with her husband and nine-month-old son, reads too many science fiction novels, attempts unreasonable knitting projects, and plays the piano badly.

Response from Laura Taalman

I would like to thank the MAA for supporting the efforts of beginning faculty with this award, and also for sponsoring programs like Project NExT, which helped me immensely as I began my mathematical career. Even more importantly, I would like to thank my colleagues in the Department of Mathematics and Statistics at James Madison University. I am very fortunate to work in a department that is supportive without being controlling, open to debate and even disagreement without being rancorous, and willing to mentor and offer advice without stifling my crazy ideas.

Lester R. Ford Awards

The Lester R. Ford Awards, established in 1964, are made to authors of expository articles published in *The American Mathematical Monthly*. The Awards are named for Lester R. Ford, Sr., a distinguished mathematician, editor of *The American Mathematical Monthly*, 1942–46, and President of the Mathematical Association of America, 1947–48.

Judith Grabiner

“Newton, Maclaurin, and the Authority of Mathematics,” *The American Mathematical Monthly*, v. 111, no. 10, December 2004, pp. 841–852.

It can be argued—and is, by Grabiner and others—that the method of creating, successively modifying, and deducing results from rigorous mathematical models began with Isaac Newton and his calculus. This “Newtonian style” perhaps had no better champion than the Scottish mathematician Colin Maclaurin (1698–1746). Grabiner engagingly describes how a 16-year-old Maclaurin attempted (in an unpublished essay) to apply techniques of calculus to ethics, and how the adult Maclaurin employed the Newtonian style to determine the shape of the earth and the precise volumes of molasses barrels, and to conduct actuarial work for the Scottish Ministers’ Widows’ Fund. The interesting particulars of some of Maclaurin’s work only illustrate Grabiner’s main point: that because Newtonianism led to successful solutions to a wide array of problems, it also imparted special authority and prestige to mathematics and mathematicians in general, and lent 18th century mathematics, in particular, an air of objectivity and certainty. This certainty, in turn, gave mathematics trustworthiness in societal and even religious matters. Grabiner’s carefully documented article provides a lively account of the broad influence of Newton’s work through that of one of his most successful followers. This paper should interest anyone curious about the direct effects of the calculus on all areas of thought.

Biographical Note

Judith V. Grabiner, the Flora Sanborn Pitzer Professor of Mathematics at Pitzer College, received her B.S. in Mathematics from the University of Chicago, and her Ph.D. in the History of Science from Harvard, where her thesis advisors were I. Bernard Cohen and Dirk J. Struik. The author of *The Origins of Cauchy’s Rigorous Calculus* (MIT, 1981, Dover reprint, 2005) and *The Calculus as Algebra: J.L. Lagrange, 1736–1813* (Garland, 1990), she became interested in Maclaurin because Cauchy and Lagrange thought he was so important, and she thought they should know best. She remains fascinated by the relationship between mathematics and society.

Response from Judith Grabiner

Receiving this award for this particular article is a special joy because it gives me the chance to record my debt to I. Bernard Cohen, who helped me understand Newton, and who taught me how to read the mathematics of the past in the context of its own time, and also to Dirk Struik, who taught me that the mathematician remains a social being no matter how abstract his or her researches appear. I also thank the Pitzer family for their generous support, both for my research and my teaching. Finally, I thank the MAA, whose support of mathematics, mathematics teaching, and mathematical exposition are essential to the health of these endeavors, both in the U. S. and in the world.

Merten M. Hasse Prize

In 1986 an anonymous donor gave the Mathematical Association of America funds sufficient to support a prize honoring inspiring and dedicated teachers. The prize was to be named after Merten M. Hasse, who was a former teacher of the donor, and who exemplified these qualities of a fine teacher. The prize is designed to be an encouragement to younger mathematicians to take up the challenge of exposition and communication. The Merten M. Hasse Prize is for a noteworthy expository paper appearing in an Association publication, at least one of whose authors is a younger mathematician.

Maureen T. Carroll and Steven T. Dougherty

“Tic-Tac-Toe on a Finite Plane,” *Mathematics Magazine*, Vol. 77, No. 4, October 2004, pp.260–274.

In this entertaining article, the authors tweak the familiar game of tic-tac-toe by placing it in a new context: the finite affine or projective plane, noting that “with this new twist, the game that grew tiresome for us as children is transformed into an interesting, geometrically motivated game.” And indeed it is! Not only does mathematics motivate the game, but the game motivates mathematics—we are treated to a tour of topics such as Latin squares, axioms for affine planes, and strategy-stealing and weight functions in game theory. These ideas help the authors classify those affine or projective planes on which there is a winning strategy. Throughout the article, the authors invite us to participate in the discoveries, just as they have involved their students. Their choice of topic, friendly exploration, tidy conclusion, and smooth exposition make this article fun and engaging reading.

Biographical Note

Maureen T. Carroll is an Associate Professor at the University of Scranton. She and her coauthor first started their collaborations when they were both graduate students at Lehigh University. Although her dissertation field was functional analysis, she has also published papers in voting theory and game theory. She was a Project NExT fellow (green dot) and participated in the Institute in the History of Mathematics.

Biographical Note

Steven Dougherty received his doctorate from Lehigh University and is now a Professor of Mathematics at the University of Scranton. He has written over 40 papers in coding theory, number theory and combinatorics with 19 coauthors from nine different countries. He has lectured at numerous universities and conferences spanning six countries.

Response from Steven Dougherty and Maureen Carroll

We are thrilled to receive the Merten M. Hasse prize. It is a great honor to be recognized by the Mathematical Association of America for our exposition. As professors, we have dedicated ourselves to guiding students in the path of mathematical discovery. In the paper, our hope was to make interesting results from finite geometry, combinatorics, and game theory accessible to students through the use of our game. We are especially proud to be honored by an organization that dedicates itself to beautiful mathematics, excellence in teaching, and student involvement. In addition to thanking the University of Scranton for its support, we must also thank our students. Not only did they help inspire the idea for the game, they also keep the spirit alive by competing in our annual tic-tac-toe contest.

In Memoriam

Robert F. (Bob) Witte died October 3, 2005. In his work with The Exxon Education Foundation, his personal commitment to improve mathematics education led to his support of both AWM and Project NeXT. A mechanical engineer, he spent his nearly 40-year career working for Exxon. For more information, see www.maa.org/news/100605_witteobit.html, where we find this pithy observation: Witte’s First Law of Productivity: “If you work on the wrong thing, no matter how hard you work, you will never get the right answer.”

AWM Workshop for Women Graduate Students and Recent Ph.D.'s

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

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

WHEN: The next summer AWM Workshop is scheduled to be held July 10–12, 2006, in conjunction with the Society for Industrial and Applied Mathematics (SIAM) 2006 Annual Meeting at the Boston Park Plaza Hotel, July 10–14, 2006. Suzanne Lenhart (University of Tennessee) and Renee Fister (Murray State University) are the workshop organizers.

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, Financial Mathematics, 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 Web site.

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

Workshop Selection Committee
11240 Waples Mill Road, Suite 200
Fairfax, VA 22030

Phone: 703-934-0163


E-mail: awm@awm-math.org

URL: www.awm-math.org

APPLICATION DEADLINE

Applications must be received by **January 26, 2006**. Applications via e-mail or fax will not be accepted.

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**DIMACS Reconnect '06 Conference:
Morgan State University
Simple and Complex Discrete-Time Population
Models in Ecology and Epidemiology**

The Reconnect '06 Conference sponsored by DIMACS (the Center for Discrete Mathematics and Theoretical Computer Science) is geared towards exposing faculty teaching undergraduates to current research topics relevant to the undergraduate 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 program at Morgan State in Baltimore will be held July 9–July 15, 2006. It is anticipated that 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.

**Department of Mathematics
University of Florida**

**22nd Annual Southeastern
Analysis Meeting**

March 2–5, 2006

The Department of Mathematics at the University of Florida is hosting the 22nd Annual Southeastern Analysis Meeting (SEAM XXII), March 2–5, 2006, as part of its special year in probability and analysis. For details about the conference and contact information, visit the special year web site at <http://www.math.ufl.edu/~sam/payr>.

Research topic:
Low Dimensional Topology

Education Theme:
Knowledge for Teaching
Mathematics

A three-week summer program for
graduate students
undergraduate students
mathematics researchers
undergraduate faculty
secondary school teachers
math education researchers

IAS/Park City Mathematics Institute (PCMI)

June 25-July 15, 2006
Park City, Utah

Organizers: Tomasz Mrowka, Massachusetts Institute of Technology; Peter Ozsvath, Columbia University.

Graduate Summer School Lecturers: John Etnyre, University of Pennsylvania; Ron Fintushel, Michigan State University; David Gabai, Princeton University; Cameron Gordon, University of Texas; Mikhail Khovanov, Columbia University; Ron Stern, University of California Irvine; Zoltan Szabo, Princeton University.

Clay Senior Scholars in Residence: Yakov Eliashberg, Stanford University; Robion Kirby, University of California Berkeley.

Other Organizers: Secondary School Teachers Program: Gail Burrill, Michigan State University; Carol Hattan, Vancouver, WA; James King, University of Washington. Undergraduate Summer School: William Barker, Bowdoin College; Aaron Bertram, University of Utah; Roger Howe, Yale University. Undergraduate Faculty Program: Daniel Goroff, Harvey Mudd College and Harvard University.

Applications: www.ias.edu/parkcity

Deadline: February 15, 2006

IAS/ Park City Mathematics Institute
Institute for Advanced Study, Princeton, NJ 08540
Financial Support Available

CORNELL UNIVERSITY

summer math institute

June 17 - August 6, 2006

SMI is a seven-week residential summer program that prepares students for graduate work in the mathematical sciences.

We are committed to increasing diversity in the mathematical sciences.

Apply online by March 1, 2006

\$3000 + Room, board, travel

www.cam.cornell.edu/~smi



The Department of Mathematics at Smith College invites sophomores planning to major in mathematics to apply for a year's or semester's visit.

Junior Year Visiting Program for the Study of Mathematics

A chance to study mathematics at a women's college.

At Smith, women are taken seriously. Half of the mathematics faculty are women. All of the majors are women.

A chance to become immersed in mathematics.

Smith is a small institution (2,700 students) with a proportionately large mathematics community (45 majors, 14 faculty) and a rich curriculum (18 upper-level courses offered this year).

A chance to experience mathematical research.

Juniors at Smith have the opportunity to work on research projects with members of the faculty. Many mathematics undergraduates have written and presented papers with their professors.

Visit www.math.smith.edu/junioryear or contact Ruth Haas, Chair of Mathematics, at (413) 585-3872 / rhaas@math.smith.edu for more information on the program.



SMITH COLLEGE

UNIVERSITY OF LOUISVILLE, Louisville, KY.

The Department of Mathematics at the University of Louisville invites applications from an applied mathematician in the area of combinatorial optimization, logistics, or operations research, for a new tenure-track position at the Assistant Professor level beginning Fall 2006.

The ideal candidate will have a demonstrated record of excellence in research and teaching as well as experience with extramural funding. The Minimum qualifications for this position include a Ph.D. degree, or its equivalent, in the Mathematical Sciences. The expectations include that the successful applicant will contribute fully to both undergraduate and graduate instruction and research, attract extramural funding and conduct interdisciplinary work with researchers from other departments including those from the Logistics and Distribution Institute (LoDI). The Institute is an interdepartmental effort with components located in the College of Arts and Sciences, the College of Business, and the J. B. Speed Scientific School (the school of engineering and applied sciences). Interested applicants should submit (1) the AMS Standard Coversheet; (2) curriculum vitae; (3) summary of research interest; (4) statement of teaching qualifications; and (5) at least four letters of recommendation, including letters which discuss at length research and teaching qualifications. For full consideration, all materials must be received by **February 15, 2006**. Applications should be sent to: Search Committee (Logistics), Department of Mathematics University of Louisville Louisville, KY 40292.

The Department of Mathematics is committed to building a culturally diverse faculty and strongly encourages women, African Americans, and other minorities to apply. AA/EOE

Lecturer in Mathematics (non-tenure track) Department of Mathematics

The Mathematics Department of Monmouth University is seeking a full-time faculty member at the level of Lecturer for the 2006-2007 academic year beginning August 25, 2006. The position is non-tenure track, and renewable up to an additional four years. The position requires a Ph.D. in mathematics, applied mathematics, statistics, or mathematics education. Dedicated, effective teaching is the primary responsibility; the 12-credit per semester teaching load will be primarily at the remedial and entry-level. Some scholarly activity and departmental service are also required. Applicant must be available and willing to teach both day time and evening classes.

The Mathematics Department has 13 full-time faculty members and approximately 14 part-time instructors. The Department offers baccalaureate programs in mathematics and mathematics education. The Department has a dedicated computer teaching laboratory, and administers the Mathematics Skills Center, which provides peer tutoring. More information about the department can be found at www.monmouth.edu/academics/deptlinks/mathematics.asp.

Monmouth University, located in Monmouth County along the Central Jersey shore approximately one hour south of New York City and 1.5 hours northeast of Philadelphia, is designated a teaching university by the State of New Jersey, has 4500 undergraduates and 1800 graduate students. More information about the University can be found at www.monmouth.edu. Our location puts us near a wide variety of industries, including telecommunications, financial, educational testing, and computer software. The University is committed to creating a more diverse environment. If you have questions about the positions or the department, contact the chair of the search committee, B. Lynn Bodner, bodner@monmouth.edu.

Applicant should send cover letter, resume, teaching statement, copies of graduate transcripts (official transcripts will be requested of those invited for on-campus interviews), and the names and phone numbers of 3 references, to: Frank Lutz, Dean School of Science, Technology and Engineering Monmouth University West Long Branch, NJ 07764-1898 Applications must be postmarked on or before March 15, 2006 to assure full consideration.

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University of Massachusetts Boston

Assistant Professor

The Department of Mathematics at the University of Massachusetts Boston invites applications for a tenure-track position at the Assistant Professor level beginning September 1, 2006. Candidates must possess a Ph.D. in mathematics, show promise of an active research program and have a strong commitment to undergraduate teaching. Special consideration will be given to applicants with specialization in Differential Geometry, Combinatorial Analysis, or Representation Theory. The Department of Mathematics currently offers bachelors degrees in mathematics, as well as graduate courses that constitute the mathematical portion of a master's degree in education.

Applicants should send a curriculum vitae, a brief statement of current research plans and teaching interests, and arrange to have three letters of recommendation sent to the following address: **Mathematics Search Committee, Department of Mathematics, University of Massachusetts Boston, 100 Morrissey Boulevard, Dorchester, MA 02125.**

For more information about the Mathematics Department, visit our web sites at www.math.umb.edu.

UMass Boston is an Affirmative Action, Equal Opportunity, Title IX employer and strongly encourages women, members of all ethnic groups, and people with disabilities to apply.

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BALL STATE UNIVERSITY – DEPARTMENT OF MATHEMATICAL SCIENCES — ASSISTANT/ASSOCIATE PROFESSOR, MATHEMATICS EDUCATION MUNCIE, INDIANA. Tenure-track position available August 1, 2006. Responsibilities: teaching (both content and methods), research in mathematics education, and professional service, including working with both prospective and in-service teachers at the elementary, middle, and/or high school levels. Teaching load is approximately 8 to 9 hours per semester. Salary and benefits are competitive and commensurate with qualifications, and additional benefits for first-year faculty are negotiable. Minimum qualification: all requirements for a doctorate in mathematics education completed by August 1, 2006. Preferred qualifications: equivalent of at least a bachelor's degree or higher in one of the mathematical sciences; current or previous teaching licensure or certification at the elementary, middle or high school level or two years of teaching experience at either the elementary, middle, or high school level; strong interest in pre-service teacher preparation. The department provides programs in mathematics education at the undergraduate level, including secondary and middle school teaching majors and a mathematics area of concentration for elementary education majors. The department also offers M.A. programs in mathematics education with options for elementary/middle school and secondary mathematics, and participates in the Ed.D. in science education program offered through the College of Sciences and Humanities. For a file to be complete, an applicant should send letter of application; curriculum vitae; research summary; three letters of reference, at least one of which substantially addresses the candidate's teaching ability and performance; and a copy of graduate transcripts showing highest degree earned to: Kay Roebuck, Chair, Mathematics Education Search Committee, Department of Mathematical Sciences, Ball State University, Muncie, IN 47306. (Tel: 765.285.8640; Fax: 765.285.1721; E-mail: kroebuck@bsu.edu) Review of completed files will begin January 3, 2006, and will continue until the position is filled. (www.bsu.edu/math) Applicants should inform the search committee chair if they plan to attend the AMTE meeting in Tampa or the Joint Mathematics Meetings in San Antonio. The department seeks to attract an active, culturally and academically diverse faculty of the highest caliber to further the mission of the department and the university. Ball State University is an equal opportunity, affirmative action employer and is strongly and actively committed to diversity within its community.

BOISE STATE UNIVERSITY — The Biomolecular Research Center at Boise State University announces Tenure Track Faculty Position. The Biomolecular Research Center at Boise State University seeks applicants for a tenure track position in Bioinformatics at the Assistant or Associate level. A doctoral degree in an appropriate field such as bioinformatics, biochemistry, computer science, computer engineering, mathematics, statistics or biology is required. Experience in algorithm development and an aptitude to work in cluster computer environments available at Boise State are required. Candidates must demonstrate a willingness to collaborate with multiple departments and develop an interdisciplinary program. This position requires a commitment to both research and education. The successful candidate will be expected to develop a strong, extramurally funded research program in proteomics, functional genomics or structural genomics and coordinate undergraduate and graduate courses in bioinformatics as well as develop new courses in area of expertise. For more information on the Center and participating departments, visit the Boise State hiring website at <http://hrs.boisestate.edu/joblistings> or the BRC website at <http://brc.boisestate.edu/>. Send applications including a cover letter, curriculum vitae, a statement of teaching interests and research plan, and contact information for three professional references in a single PDF via e-mail to barbaraJibben@boisestate.edu with Bioinformatics Position in the subject line. Review of applications will remain open until position is filled. We are a rapidly growing research university in Idaho's capital city, which is highly ranked for livability, cultural offerings, and proximity to outdoor recreational activities. The location in a high-tech region with microelectronic industries and biomedical research centers provides a favorable environment for collaborative research. Boise State University is an Equal Employment Opportunity/Affirmative Action Employer. Vets Preferences may be applicable.

CALIFORNIA STATE UNIVERSITY — NSF REU (Research Experience for Undergraduates) at California State University, Chico. Possible topics include Knot Theory, Dynamic Geometry, and Mathematical Modeling. Dates: June 19 July 28. Support: \$1800 plus travel and housing. Application Deadline: March 1. Applicants must be US Citizens or permanent residents intending to continue undergraduate studies in the fall. Women and students from underrepresented minorities are particularly encouraged to apply. See <http://www.csuchico.edu/math/mattman/REUT.html> or contact Thomas Mattman, TMattman@CSUCHICO.EDU. Funded by NSF REU award 0354174.

KANSAS STATE UNIVERSITY — DEPARTMENT OF MATHEMATICS — Subject to budgetary approval, applications are invited for an Algebra Coordinator position commencing August 13, 2006. The coordinator will work with the Center for Quantitative Education on the design and implementation of a new instructional program in College Algebra in a modern technological environment. The coordinator will collaborate with the director of the center, teach in the program, assist in training graduate students, and manage student interactions. Applicants must have a commitment to excellence in teaching. A Ph.D. in mathematics or a Ph.D. dissertation accepted with only formalities to be completed is required. Preference will be given to applicants with background in mathematics education, especially in the training of graduate students, and/or teaching with technology. Letter of application, current vita, three letters of reference, and a statement of teaching philosophy should be sent to: Louis Pigno, Kansas State University, Department of Mathematics, Cardwell Hall 138, Manhattan, KS 66506. Applications for the position will be reviewed beginning December 5, 2005, and will continue until the position is closed. Kansas State University is an equal opportunity employer. Paid for by Kansas State University.

KANSAS STATE UNIVERSITY — DEPARTMENT OF MATHEMATICS — Subject to budgetary approval, applications are invited for one or more visiting assistant professorships commencing August 13, 2006. Instructors will be Fellows of the Center for Quantitative Education and will participate in the design and implementation of an innovative algebra course, including an online homework system, and teach in the undergraduate program. Successful candidate(s) will have time to pursue research in the department along with these duties. Applicants must have a commitment to excellence in teaching. A Ph.D. in mathematics or a Ph.D. dissertation accepted with only formalities to be completed is required. Preference will be given to applicants with background in mathematics education and/or teaching with technology, as well as applicants whose research interests mesh well with current department faculty. Letter of application, current vita, three letters of reference, and a statement of teaching philosophy should be sent to: Louis Pigno, Kansas State University, Department of Mathematics, Cardwell Hall 138, Manhattan, KS 66506. Applications for the position will be reviewed beginning December 5, 2005, and will continue until the position is closed. Kansas State University is an equal opportunity employer. Paid for by Kansas State University.

KUTZTOWN UNIVERSITY OF PENNSYLVANIA — Tenure-track positions — Mathematics or Mathematics Education. Kutztown University enrolls approximately 10,000 students in graduate and undergraduate programs. The University is adjacent to the borough of Kutztown in a charming rural setting and is within 30 minutes driving time of the diverse metropolitan areas Allentown/Bethlehem and Reading, and within 60 minutes of the Philadelphia metropolitan area. The University is very interested in hiring employees who have had extensive experience with diverse populations. Multiple tenure-track Mathematics or Mathematics Education positions at the Assistant Professor or Instructor level starting in Fall 2006 with preference given to applicants showing evidence of strong teaching. Positions involve teaching a variety of undergraduate and graduate Mathematics or Mathematics Education courses with a regular teaching load of 12 hours per week each semester. A doctorate in mathematics or mathematics education is preferred, but we will consider applicants with a strong master's degree in the mathematical sciences if either they have a doctorate in a related field or they are ABD candidates for the doctorate in mathematics or Mathematics Education and will complete the doctorate within two years. In addition to showing evidence of active growth in Mathematics or Mathematics

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Education, applicants must demonstrate the ability to make contributions in teaching, program and curriculum development, research, scholar activity, and service to the university. Consideration will be given to applicants having areas of concentration that complement the department's current specialties. Public school teaching experience and Pennsylvania Teacher Certification is desired for the Mathematics Education candidates. A successful interview and demonstration of teaching ability are required. Send a letter of application, a current resume, official undergraduate and graduate transcripts, and three current letters of recommendation to: Dr. Lyn Phy, Mathematics Department, Kutztown University of Pennsylvania, PO Box 730, Kutztown, PA 19530. Electronic submissions will not be considered. Review of applications will begin immediately and will continue until the position is filled. Kutztown University is an AA/EOE/member of the PA State System of Higher Education and actively solicits applications from women and minority candidates. For more information about employment opportunities, visit our website at: www.kutztown.edu/employment.

LEHMAN COLLEGE (CUNY) — Department of Mathematics and Computer Science — Tenure track position(s) available starting September 1, 2006 for Assistant/ Associate Professors in Mathematics or Computer Science. Position(s) require an earned doctorate, outstanding research record or potential and commitment to excellence in teaching and service. Appointment rank and salary commensurate with qualifications and experience. Application procedure: Send curriculum vitae along with a cover letter and arrange for at least three letters of recommendation to be 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, 2006 and will continue until positions are filled. Use of the AMS Cover Sheet for Academic Employment is encouraged. Additional information at <http://www.lehman.cuny.edu>. AA/EEO/ADA Employer.

PURDUE UNIVERSITY — FACULTY POSITIONS IN STATISTICS — The Department of Statistics at Purdue University invites applications for tenure-track positions beginning August 2006. A number of positions are available at the Assistant Professor level; senior positions will be considered for highly qualified applicants. Applications from outstanding candidates in all areas of statistics will be considered. Of particular interest are candidates with a research record in the areas of financial statistics/probability, statistical computing or spatial statistics. The statistical computing and spatial statistics areas are part of a College of Science-wide hiring effort and applicants should address the multidisciplinary contributions of their work in their research statements. The Department of Statistics offers a stimulating and nurturing academic environment. Thirty tenured and tenure-track faculty members direct research programs in a broad range of areas. Further information about the department is available at <http://www.stat.purdue.edu>. Information about the College of Science multidisciplinary hiring effort and its targeted areas can be found at <http://www.science.purdue.edu/COALESCCE>. All applicants should hold a PhD in Statistics, or a related field, be committed to excellence in teaching, and have demonstrated strong potential for excellence in research. Salary and benefits are highly competitive. Applicants are strongly encouraged to apply electronically by sending their curriculum vitae, research and teaching statements, and names and contact information of at least three references in PDF to facsearch@stat.purdue.edu. Hard copy applications can be sent to: Faculty Search Chair, Department of Statistics, 150 N. University Street, Purdue University, West Lafayette, IN 47907-2067. Applicants for assistant professor positions are asked to have the three references send letters to the email address above or the hard copy mailing address. Applicants matching one search may be considered in other relevant searches when appropriate. Review of applications will begin on December 1, 2005, and will continue until the positions are filled. Purdue University is an Equal Opportunity/Equal Access/Affirmative Action employer and is committed to building a diverse faculty of excellence.

REED COLLEGE — The Mathematics Department invites applications for a one-year visiting position, rank open, to begin in Fall, 2006. Preference will be given to candidates in computer science or statistics. Reed is a distinguished liberal arts college with 1200 students that offers a demanding academic program to bright and dedicated undergraduates. Applicants should be committed to excellence in teaching, and are expected to have a Ph.D. in computer science, statistics, or mathematics by the start of the 2006-2007 academic year. Faculty members teach five semester courses per year (usually two course preparations per semester) and supervise senior theses (required of all students). For further information about the department, see <http://academic.reed.edu/math/>. Applicants should submit a curriculum vita and a statement of teaching and research interests, and arrange to have three letters of recommendation sent to: Jerry Shurman, Chair, Mathematics Search Committee, Mathematics Department, Reed College, 3203 S.E. Woodstock Blvd., Portland, Oregon 97202-8199. Applications will be accepted until the position is filled, but they should be received by February 1, 2006, to guarantee full consideration. An Equal Opportunity Employer, Reed values diversity and encourages applications from underrepresented groups.

SKIDMORE COLLEGE — The Department of Mathematics and Computer Science invites applications for two one-year visiting positions in Mathematics beginning September 2006. A commitment to quality instruction of undergraduates is essential, and an ability to teach undergraduate courses at all levels is desirable. Responsibilities will include teaching 5-6 undergraduate courses per year. Applicants must have at least an MA in the Mathematical Sciences (a Ph.D. is preferred). For detailed information, see <http://www.skidmore.edu/academics/mcs>. Candidates for the position should submit a letter of application and resume, and have three letters of recommendation, at least one of which addresses teaching experience, sent separately. Electronic submittals are preferred and should be sent to mathsearch@skidmore.edu. Mailed applications and recommendations should be sent to: Anita Miczek, Department of Mathematics and Computer Science, Skidmore College, 815 North Broadway, Saratoga Springs, NY 12866. Applications received before April 1, 2006 will receive full consideration; however, applications will be accepted until the position is filled. Applications from members of underrepresented groups are especially encouraged.

TEMPLE UNIVERSITY — The Department of Mathematics at Temple University anticipates an opening for a one- to two-year position as Assistant Research Professor of Mathematics to commence on 1st July 2006. This position has a reduced teaching load, since the candidate will be working in an externally-funded project "Schwarz Preconditioners for Krylov Methods: Theory and Practice," coordinated by Prof. Daniel B. Szyld. The ideal candidate should have a Ph.D. in Mathematics (or related field) by the time of appointment, and experience in one or more topics of the above mentioned project. Candidates with experience in other areas of numerical analysis and scientific computing will also be considered. Applications from women and underrepresented minorities are especially encouraged. Temple University is an Affirmative Action employer. Applications including a cover letter, a CV, and letters of recommendation should be sent to Daniel B. Szyld, Department of Mathematics, Temple University (038-16), 1805 N. Broad Street, Philadelphia, PA 19122-6094. Inquires can be addressed to szlyld@math.temple.edu

TOWSON UNIVERSITY — DEPARTMENT OF MATHEMATICS, The Jess & Mildred Fisher College of Science & Mathematics — Applicants are invited to apply for a tenure-track appointment in applied mathematics at the rank of Assistant Professor beginning Fall 2006. Position is contingent on final funding approval for FY 07. Preference will be given to candidates that can support the Department of Mathematics graduate program in Applied and Industrial Mathematics. The salary is competitive. Applicants must have an earned doctorate in mathematics at time of hire. Applicants must possess a commitment to teaching, an active research program, and the ability to teach a variety of courses, at both the undergraduate and graduate levels. The Department of Mathematics (<http://www.towson.edu/math>) offers bachelor's degree programs in pure mathematics, applied mathematics, actuarial science and risk management, and mathematics education. Master's degree programs are offered in applied and industrial mathematics, and

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mathematics education. Applicants should submit a letter of application, a resume, a description of research, a statement of teaching experience and philosophy, and copies of all graduate transcripts. Additionally, three letters of recommendation, addressing both teaching and research should be sent to: Dr. Raouf Boules, Chairperson, Search Committee Department of Mathematics, Towson University, 8000 York Road, Towson, MD 21252-0001. Applications or material sent by e-mail or facsimile will not be considered. Priority will be given to applications received on or before February 15, 2006. Towson University is an equal opportunity/affirmative action employer and has a strong institutional commitment to diversity. Women, minorities, persons with disabilities, and veterans are encouraged to apply.

TUFTS UNIVERSITY — DEPARTMENT OF MATHEMATICS, COMPUTATIONAL PARTIAL DIFFERENTIAL EQUATIONS — Applications are invited for a tenure-track Assistant Professorship to begin September 1, 2006. Applicants must show promise of outstanding research in the area of Computational Partial Differential Equations, as well as excellent teaching. The teaching load will be two courses per semester. Preference will be given to candidates who show potential for interaction with existing applied mathematics research efforts in the department, including computational neuroscience, numerical linear algebra, computational fluid dynamics, and inverse problems. Applicants should send a curriculum vitae and have three letters of recommendation sent to CPDE Search Committee Chair, Department of Mathematics, Bromfield-Pearson Hall, Tufts University, Medford, MA 02155. Review of applications will begin on January 15, 2006 and continue until the position is filled. Tufts University is an Affirmative Action / Equal Opportunity employer. We are committed to increasing the diversity of our faculty. Members of underrepresented groups are strongly encouraged to apply.

TUFTS UNIVERSITY — DEPARTMENT OF MATHEMATICS, METRIC SPACES OF NONPOSITIVE CURVATURE — Applicants are invited for a tenure-track Assistant Professorship to begin September 1, 2006. Applicants must show promise of outstanding research in the area of metric spaces of nonpositive curvature, including nonpositively curved manifolds and more general CAT(0) spaces. Ph.D. and evidence of strong teaching ability are required. The teaching load will be two courses per semester. Applicants should send a curriculum vitae and have three letters of recommendation sent to Richard Weiss, Nonpositive Search Committee, Department of Mathematics, Tufts University, 503 Boston Avenue, Medford, MA 02155. The review of applications will begin January 23, 2006, and continue until the position is filled. Tufts University is an Affirmative Action/Equal Opportunity employer. We are committed to increasing the diversity of our faculty. Members of underrepresented groups are strongly encouraged to apply.

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO — Applications are invited for a tenured or tenure-track assistant/associate professorship, in mathematics or mathematics education, to start in Fall 2006. Applicants must have or anticipate a Ph.D. in mathematics or in mathematics education by August 2006 and will be expected to maintain an active research program in mathematics or mathematics education. The person in this position will serve as coordinator for the Department's teacher education programs, will be responsible for advising and teaching courses for prospective mathematics teachers, and will be the Department's primary liaison to the School of Education. The department offers the BS, BA, MA degrees in mathematics and the BS, MS degrees in computer science. The application should include an AMS cover sheet, curriculum vitae, description of current research, statement of teaching philosophy, and three letters of recommendation, including one letter addressing the candidate's teaching abilities. Send to: Chair, Mathematics Search Committee (1840), Department of Mathematical Sciences, University of North Carolina at Greensboro, Greensboro NC 27402. Applications received by January 31, 2006 will be guaranteed full consideration. The University of North Carolina at Greensboro is an affirmative action, equal opportunity employer. EEO/AA. We cannot process email applications.

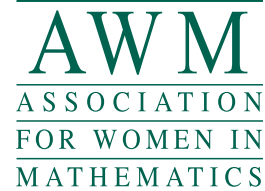
UNIVERSITY OF TEXAS AT EL PASO — The Department of Mathematical Sciences invites applications for three faculty positions at the Assistant or Associate Professor level: one position each in Computational Mathematics, Mathematics Education, and Statistics. For more details, see <http://www.math.utep.edu/hiring/index.html>. The University of Texas at El Paso is an equal opportunity employer committed to excellence through diversity. The University does not discriminate on the basis of race, color, national origin, sex, religion, age, disability, veteran's status, or sexual orientation in employment or the provision of services. UTEP is a recipient of an NSF ADVANCE Institutional Transformation Award (to increase the participation of women in academic science and engineering careers), which includes an active dual-career partner program.

WESTERN KENTUCKY UNIVERSITY — DEPARTMENT OF MATHEMATICS — Applications are invited for the position of Head of the Department of Mathematics starting July 1, 2006. Applicants must have a doctorate in mathematics or a mathematical science with appropriate credentials for a tenured appointment at the rank of professor. We are seeking a dedicated and effective leader who can help promote and strengthen the department's academic, research, and service programs. Qualified candidates must have an established record of high quality teaching and research/scholarly activity and a history of significant professional service. Evidence of additional administrative expertise is desired. Qualified candidates must also be committed to recognizing and encouraging excellence in teaching and research/scholarly activity, and be familiar with current issues involving the mathematics curriculum and technology. Mathematics is one of nine departments in the College of Science and Engineering. With 35 full-time positions (23 tenured/tenure-track), the department offers baccalaureate and masters programs in mathematics. In addition, mathematics is included in the university general education requirements for all undergraduate degrees and the department is actively involved in teacher preparation. Western Kentucky University enrolls approximately 18,000 undergraduate and graduate students, including more than 1,400 minority and 500 international students, and has a strong commitment to achieving diversity among faculty, staff, and administration. The university is in Bowling Green, between Louisville and Nashville, TN. Review of applications will begin January 16, 2006 and will continue until the position is filled. Please send a letter of application, vita, a statement of administrative leadership philosophy, and at least three letters of recommendation to: Dr. Keith Andrew, Chair, Mathematics Head Search Committee, Department of Physics and Astronomy, Western Kentucky University, 1906 College Heights Boulevard #11077, Bowling Green, KY 42101-1077. E-mail: MathHeadSearch@physics.wku.edu. For more information about the Department of Mathematics at Western Kentucky University, visit our web page at www.wku.edu/math. All qualified individuals are encouraged to apply including women, minorities, persons with disabilities and disabled veterans. Western Kentucky University is an Affirmative Action/Equal Opportunity Employer.

WILLIAMS COLLEGE — The Department of Mathematics and Statistics invites applications for a newly authorized visiting position in mathematics for the 2006-2007 year, probably at the rank of assistant professor, however, in exceptional cases, a more advanced appointment might be considered. A Ph.D. is required. Send a vita and three letters of recommendation on teaching and research to: Visitor Hiring Committee, Department of Mathematics and Statistics, Williams College, Williamstown, MA 01267. Consideration of applications will begin on November 15th and 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 AA/EOE employer, Williams especially welcomes applications from women and minority candidates.

2006 Membership Form

JOIN ONLINE at www.awm-math.org!



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

AWM Membership, 11240 Waples Mill Road, Suite 200, Fairfax, VA 22030

The *AWM Newsletter* is published six times a year and is part of your membership. Any questions, contact AWM at awm@awm-math.org; (703)934-0163 or refer to our website at: <http://www.awm-math.org>.

I do not want my AWM membership information to be released for the Combined Membership List.

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(703) 934-0163
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PROFESSIONAL INFORMATION:

Position: _____

Institution/Company: _____

City, State, Zip: _____

If student, check one:

Graduate Undergraduate

If not employed, leave position and institution blank.

	Degree(s)	Institution(s)	Year(s)
DEGREES EARNED:			
Doctorate:	_____	_____	_____
Master's:	_____	_____	_____
Bachelor's:	_____	_____	_____

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 1 to September 30.

- FIRST YEAR REGULAR INDIVIDUAL MEMBERSHIP \$ 30 _____
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- 2ND FAMILY MEMBERSHIP \$ 30 _____
(NO newsletter) Please indicate regular family member: _____
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- RETIRED or PART-TIME EMPLOYED MEMBERSHIP (circle one) \$ 30 _____
- STUDENT or UNEMPLOYED MEMBERSHIP (circle one) \$ 20 _____
- ALL FOREIGN MEMBERSHIPS (INCLUDING CANADA & MEXICO)...For additional postage, add \$ 10 _____
All payments must be in U.S. Funds using cash, U.S. Postal orders, or checks drawn on U.S. Banks.
- BENEFACTOR [\$2,500] or FRIEND [\$1,000] (circle one) \$ _____
- I am enclosing a DONATION to the "AWM GENERAL FUND" \$ _____
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- 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) \$300 _____
- CATEGORY 2A (includes 3 student memberships; 1 free ad; 10% off additional Newsletter & online ads) \$175 _____
- CATEGORY 2B (includes 6 student memberships; 10% off Newsletter & online ads) \$150 _____

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. 1 to Sept. 30. 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 \$20 (\$30 for foreign members) to 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 \$** _____

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- Please change my address to:
- Please send membership information to my colleague listed below:
- No forwarding address known for the individual listed below (enclose copy of label):
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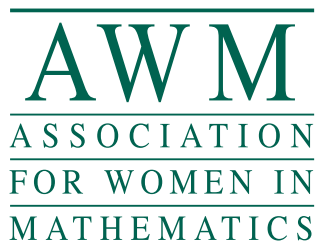
I **DO NOT** want my AWM membership information to be released for the **Combined Membership List (CML)**.

MAIL TO:

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